



**TECHNICAL
UNIVERSITY**
OF CLUJ-NAPOCA
ROMANIA

Research Reports

2020



MINISTRY OF EDUCATION AND RESEARCH



TECHNICAL UNIVERSITY
OF CLUJ-NAPOCA, ROMANIA

RESEARCH REPORTS

2020

UTPRESS
Cluj-Napoca, September 2020

The Research Strategy of the Technical University of Cluj-Napoca for 2016-2020, (Extract from the Strategic Plan of the Technical University of Cluj-Napoca for 2016-2020)

The Mission of the Technical University of Cluj-Napoca is conducted in the following directions:

- human resources education through bachelor, master, doctoral programs and continuing education based on the paradigm "education through research and for research";
- relevant knowledge generated through research, innovation and artistic creation, pursuing results that bring prestige and visibility to the university and are also transferable to products, technologies and solutions;
- commitment to society, assumed on the institutional level the role of "active citizen" in the local, regional and national community;
- connecting the academic community to the European and global one, facilitating the access of the local and regional community to the globalized flow of knowledge and values.

The Technical University of Cluj-Napoca aims to integrate in the components of its mission the strategic European, national and regional approaches. These create a real potential for the competitive positioning of the university in the national and international academic area and a potential for convergence with the intelligent economic development directions.

The Vision of the Technical University of Cluj-Napoca is ambitious but realistic, without imposing revolutionary leaps, but steering the university firmly towards an approach that combines commitment for excellence with assumed responsibility both by the members of the academic community and by its leaders for their contribution to progress through:

- academic excellence acknowledged by national and international community;
- participation in the social prosperity and economic development of the region and in the international exchange of values;
- practice of a powerful entrepreneurial behavior connected with responsibility in resource management;
- development of a strong academic community through promoted values, motivated by performance and responsibility for its own benefit;
- fostering of an institutional environment that combines attractiveness and responsibility for university students and ensures equal chances for access to opportunities.

The proposed vision reflects the Technical University's commitment to follow the educational trends that lead to excellence in scientific research. In addition, this view reflects maturity, institutional strength and stability which the university upholds.

The Technical University of Cluj-Napoca builds its activity and institutional relations on a set of fundamental values regarding the external environment, work, and the relations established among the members of the community. This set of values includes:

1. public responsibility and openness to the needs and demands of the society, and respect for the community and the environment;
2. competence and creativity in assignments, honesty and integrity relating to the institution and individual work, performance and assumed responsibilities for the quality of own activities;
3. original initiative and active entrepreneurship as facilitators of organizational development, leadership, fairness and equality in access to opportunities, and objective recognition of the contribution of each member of the community;
4. transparency in actions and decisions to provide a general climate of objectivity and reliability;
5. knowledge and mutual respect, consideration for the rules of conduct in the community, collaboration, solidarity and academic collegiality.

These values come to complete the vision and mission of the university, being the foundations of all ethical, professional and educational activities.

Research Objectives and Strategy for 2016-2020

The main objective of the university is to maintain its position gained as top research-oriented educational institution, both nationally and internationally. In addition to this major objective, there are other objectives that contribute to its strengthening, as follows:

- development of excellence in scientific research and innovation
- development of human resources involved in the research activities;
- growth of research and innovative infrastructure;
- stimulation of a dynamic relationship with the socio-economic environment for technology transfer, consulting and implementation of joint scientific research projects;
- increase of its national and international visibility.

In terms of strategy, the Technical University of Cluj-Napoca has implemented several converging strategies, among which the most important are:

- the development of a strategy for scientific research, innovation and technology transfer;
- the strategy to promote excellence in scientific research;
- the strategy for socio-economic cooperation with local, national and international environment.

Directions of Intervention in Research for 2016-2020

The specific objectives associated with the new strategic cycle are implemented in a number of areas of intervention in academic and research activity. Their role, as a whole, is to structure the university's innovation system and to outline a path of transformation and evolution of key performance indicators. These lines of action for research, innovation and technology transfer are:

- increasing autonomy and development of research
- setting up and upgrading high-impact research laboratories;
- setting up an interdisciplinary research institute affiliated to the university;
- recruiting, developing and keeping the highly skilled human resources;
- supporting high performance in scientific research;
- supporting the publication of research results in prestigious journals and in scientific conferences;
- supporting the organization of international conferences with high visibility;
- developing the university's capacity and qualifications for technological transfer.

The intervention directions mentioned above are a part of an integrated combination of measures covering key dimensions of the Technical University's policy on education, research, innovation and technological transfer.

Professor Vasile Topa PhD
Rector

FOREWORD

Scientific research is an inexhaustible source of knowledge, an important resource of society, while constituting an approach to university education as well.

The Technical University of Cluj-Napoca, one of the 12 universities of "advanced research and education" in Romania, aims at engaging itself in producing outstanding scientific results and approaching interdisciplinary and multidisciplinary subjects. Furthermore, it strives to integrate the research results in the exchange of national and international values, to increase its national and international visibility, and also attract and create highly skilled human resources.

Achieving these goals must strengthen its already established position as a university of "advanced research and education", and the recognition of the Technical University of Cluj-Napoca as a center of excellence in scientific research with a high impact on the social and economic environment.

Scientific research, by its creative nature, represents one of the most important methods both in teacher or researcher training and in educating university students in the spirit of innovation, irrespective of study level.

In the Technical University of Cluj-Napoca basic and applied research, as well as innovation are promoted. The research topics cover the fields of engineering, science, and humanities. Research is conducted at department level, predominantly in over 70 accredited research structures. The new research strategy aims at creating self-sustainable interdisciplinary and multidisciplinary structures capable of outstanding scientific achievements, integrated within a multidisciplinary research institute.

The coordination of the scientific research is performed by academic staff experienced in research, and especially by PhD advisors relying on the broad involvement of the faculty, the young researchers, and the students.

Research teams enjoy the freedom of choosing their research topics, but their activities are in line with the national and international policy comprised within the strategy of research - development – innovation.

The goal of this volume is to present both the research structures existing in the Technical University of Cluj-Napoca as well as the results achieved by these in the past five years. The expected result of the volume is to enhance the cooperation between the research structures of the Technical University and other national and international structures.

Professor Sergiu Nedevschi PhD,

Vice-Rector in charge of Scientific Research





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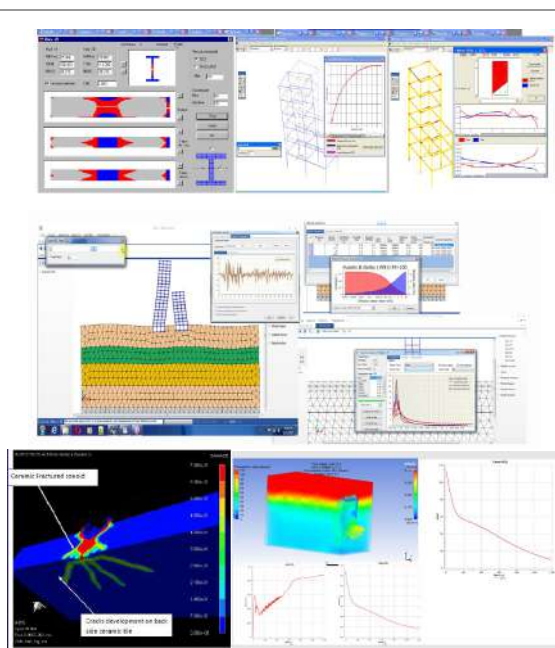
RESEARCH REPORTS



COMPUTATIONAL MODELING AND ADVANCED SIMULATION IN STRUCTURAL AND GEOTECHNICAL ENGINEERING

Contact details

Name	Computational Modeling and Advanced Simulation in Structural and Geotechnical Engineering
Acronym	CMASSGE
Logo	-
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Areas of expertise

Domain: Civil Engineering-Structural and Geotechnical Engineering

Computational and experimental techniques with emphasis on the development and application of advanced nonlinear analysis of structural limit states, progressive collapse analysis of structures, push-over analysis for seismic performance evaluation of structures, analysis of structures subjected to wind actions, finite element simulation of composite materials subjected to extreme loads such as ballistic impact and explosions, design and behaviour of composite steel-concrete structures, and application of FEM for geotechnical problems and multiphysics problems. Advanced Computational Fluid Dynamics (CFD) models to identify the mechanisms of radon accumulation and developing techniques for reducing radon accumulation in homes. The stability of thin-walled members by using the Generalised Beam Theory. The stiffness evaluation of the vertical and horizontal joints between precast RC walls. The structural health monitoring of bridges by Machine Learning algorithms trained on experimental and FE numerical data.

Team (Selection)

Prof. Cosmin G Chiorean, Dr. Mihai Nedelcu, Dr. Marius Botos, Dr. Marius Buru, Dr. Mircea Botez, Dr. Ioana Marchis, Dr. Ovidiu Prodan, Dr. Milchis Tudor, Dr. Bianca Parv, Dr. Ioana Tomascu, Dr. Zsongor Gobesz, Dr. Teodora Besoiu, Dr. Tudor Petrina, Dr. Roxana Balci, Dr. Horatiu Mociran, Dr. Cristian Mojolic, Dr. HL Cucu, Dr. Anca Popa. *Phd Students:* Alin Mihali, Marius Moldovan, Vasile Chiorean, Lavinia Cucu, Mihai Selariu, Dan Miclausoiu, Mihai Bud, Bogdan Deac.

Representative projects

Smart Systems for Public Safety through Control and Mitigation of Residential Radon linked with Energy Efficiency Optimization of Buildings in Romanian Major Urban Agglomerations Code: SMART-RAD-EN:2017-2020-A1-A1; POC-A1-A1.1.4-E-2015 (<http://www.smartradon.ro/>)
Integrated design, earthquake check and shelf structures offer, Code: PN-III-P2-2.1-CI-2017-0113, http://users.utcluj.ro/~mnedelcu/Proiect%20de%20cercetare_15CI.htm
Technology for measuring forces in tensile cables, Code: PN-III-P2-2.1-CI-2017-0116, http://users.utcluj.ro/~mnedelcu/Proiect%20de%20cercetare_29CI.htm
Design and seismic performance evaluation of 3D frame structures using advanced nonlinear static analysis method (granted by [CNC SIS](http://www.cncsis.ro/), PNII-IDEI 193/2008)- <http://www.cosminchiorean.com/projects.html>

Significant results

The most representative publications of the past 5 years:

1. A. Tunyagi et.al., "An innovative system for monitoring Radon and indoor air quality", *ROMANIAN JOURNAL OF PHYSICS*, 65, 2020
2. A.A. Muresan, M. Nedelcu, R. Goncalves, GBT-based FE formulation to analyse the buckling behaviour of isotropic conical shells with circular cross-section, *THIN-WALLED STRUCTURES* Volume: 134 Pages: 84-101 Published: JAN 2019
3. R. Moga, R. Cosgarea, S. Buru, C.G. Chiorean, "Finite element analysis of the dental pulp under orthodontic forces", *AMERICAN JOURNAL OF ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS*, 155(4), pp. 543-551, 2019.

4. L.A. Bredean, M.D. Botez, "The influence of beams and the slabs effect on the progressive collapse resisting mechanisms developed for RC framed structures", *ENGINEERING FAILURE ANALYSIS*, 91, 527-542, 2018.
5. C. G. Chiorean, "Second-order flexibility-based model for nonlinear inelastic analysis of 3D semi-rigid steel frameworks," *ENGINEERING STRUCTURES*, vol. 136, pp. 547-579, Apr 2017.
6. C. G. Chiorean and S. M. Buru, "Practical nonlinear inelastic analysis method of composite steel-concrete beams with partial composite action," *ENGINEERING STRUCTURES*, vol. 134, pp. 74-106, Mar 2017.
7. C. G. Chiorean and I. V. Marchis, "A second-order flexibility-based model for steel frames of tapered members," *JOURNAL OF CONSTRUCTIONAL STEEL RESEARCH*, vol. 132, pp. 43-71, May 2017.
8. Nedelcu M., Generalisation of the Ayrton-Perry formula for the global-distortional-local buckling of thin-walled members, *THIN-WALLED STRUCTURES*, vol. 118, pag. 73-86, 2017
9. S. Varga, C.G., Chiorean, Refined NSA Approach for Seismic Assessment of Regular RC Frames, *GRADEVINAR*, 69 (12), pp. 1137-1157, 2017.
10. M. Botez, L. Bredean, A. Ioani, "Improving the accuracy of progressive collapse risk assessment: Efficiency and contribution of supplementary progressive collapse resisting mechanisms", *COMPUTERS & STRUCTURES*, pp. 1-12, Elsevier Science Publisher, 2015.

Software developed

GFAS & RSL2D – (A Finite Element System for Geotechnical Applications) a product developed for [Geostru Corporation \(www.geostru.com\)](http://www.geostru.com) is a finite element package that has been developed specifically for the analysis of deformation and stability analysis in geotechnical engineering problems and local seismic response. <http://www.geostru.com/EN/Geotechnical-and-F.E.M.-analysis-system.aspx>

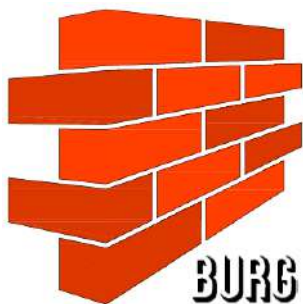
NEFCAD & ASEP – Advanced Nonlinear Inelastic Analysis System for Seismic Performance Evaluation of 3D Steel and Composite Steel-Concrete Frameworks (<http://www.cosminchiorean.com/software.html>)

The offer addressed to the economic environment

Research & development	Development of advanced nonlinear analysis methods able to describe the complex behaviour of 3D steel, RC and composite steel-concrete frame structures, <i>under normal and abnormal loads</i>. Ultimate strength analysis and design of composite-steel concrete cross-sections with arbitrary shapes subjected to biaxial bending and axial force at elevated temperatures; Computer automated optimal structural design in seismic zones based on structural performance criteria; Analysis of structures subjected to extreme actions. Development of specialized software concerning application of nonlinear analysis to describe complex behaviour of frame structures. The stability of thin-walled members by using the Generalised Beam Theory. The elastic buckling behaviour of rectangular plates with initial geometric imperfections by using energy methods and trigonometric series approximation of the displacements field. The elasto-plastic behaviour of the joints between the precast RC members. The optimisation of scaling for testing the RC walls under cyclic lateral loading. The stiffness evaluation of the vertical and horizontal joints between precast RC walls. The structural health monitoring of bridges by Machine Learning algorithms trained on experimental and FE numerical data. The effect of FRP strengthening on hollow-core slabs. Application of FEM in geotechnical and multiphysics problems: Development of general purpose and dedicated purpose finite element package (GFAS) specifically for the analysis of deformation and stability analysis in geotechnical engineering problems. Advanced Computational Fluid Dynamics (CFD) models to identify the mechanisms of radon accumulation and developing techniques for reducing radon accumulation in homes. Numerical simulation of ballistic impact on composite laminated plates: The ballistic performance of the lightweight armour systems can be examined to obtain an estimate for the V50 and the global damage of the composite plates.
Consulting	Application of nonlinear analysis methods for seismic performance evaluation of spatial structures; Application of FEM in structural and geotechnical engineering; Composite materials, Thin-walled structures, Experimental techniques.
Applied engineering services	Advanced analysis and Design of Structural Systems in Civil and Geotechnical Engineering. Software development for structural and geotechnical engineering.
Training	Advanced software applications such as: Abaqus, Ansys, GFAS, TrueGrid, MatLab; Extreme Loadings, Open Sees, etc. Application of nonlinear analysis for seismic performance evaluation of spatial structures; Application of FEM in Structural and Geotechnical Engineering and Multiphysics (CFD).

BUILDING MATERIALS RESEARCH GROUP

Contact details

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Acronym	BURG
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Areas of expertise

Civil engineering

- materials chemistry;
- green building materials;
- sustainable development;
- quality control of building materials;
- recovery of industrial waste in construction materials;
- influence of construction materials on health and environment;
- „In situ” determination of mechanical strengths by non-destructive methods.

Team

Prof. Dr. Eng. Daniela Lucia Manea; Assoc. Prof. Dr. Eng. Claudiu Aciu; Assoc. Prof. Dr. Eng. Dana Adriana Ilutiu-Varvara; Assist. Prof. Dr. Eng. Elena JUMATE; Assist. Prof. Dr. Eng. Florin Babota; Assist. Dr. Eng. Luminița Monica Pleșa; Assist. Dr. Eng. Răzvan Andrei Iermeșan; Dr. Eng. Raluca Fernea.

Phd Students: Eng. Iacob Florea; Eng. Alexandra Olga Pintea; Eng. Denes Tunde-Orsolya; Eng. Cadar Daniel; Coroian Adrian; Buhus Zaharie Anamaria; Cabas Dana; Siomin Adrian; Tintisan Coniac Maria Loredana.

Representative projects

"Studies and researches regarding the reduction of the negative environmental impact of the pollutants and solid wastes from the steelmaking", "Development and support of multidisciplinary postdoctoral programmes in major technical areas of national strategy of Research - Development - Innovation" **4D-POSTDOC**, contract no. POSDRU/89/1.5/S/52603, project co-funded by the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, <http://193.226.17.4:8080/sites/fordoc/default.aspx> (2010-2013).

"Innovative Ecological Materials in Construction: A Multicriteria Analysis for Optimizing the Choice of Sustainable Building Materials in the Context of Sustainable Development" (2014 – 2015) – Post-Doctoral Programme POSDRU/159/1.5/S/137516, project co-funded from European Social Fund through the Human Resources Sectoral Operational Program 2007-2013.

"Studies of methods to optimize the use of sludge in the building materials industry", Internal competition for Research/ Development/ Innovation. Project C.I. type 1.1-T5 / 2016, Technical University of Cluj-Napoca (2016-2017).

"Research concerning the characterization of the oily mill scale in order to identify a optimum method for reduction of the quantities of hazardous wastes landfilled", Internal competition for Research/ Development/ Innovation –Project 16362/07.07.2016, C.I. type 1.1 - T4, Technical University of Cluj-Napoca (2016-2017).

Significant results

1. Raluca Iştoan, Daniela R. Tămaş-Gavrea, Daniela L. Manea. "Experimental Investigations on the Performances of Composite Building Materials Based on Industrial Crops and Volcanic Rocks", *Crystals* 2020, 10, 102.
2. Soimosan Melania; Moga Ligia; Danku Gelu; Cazila Aurica; Manea Daniela. "Assessing the Energy Performance of Solar Thermal Energy for Heat Production in Urban Areas: A Case Study", *ENERGIES*, 12(6), 2019.
3. Pinte Alexandra Olga; Manea Daniela Lucia. "New types of mortars obtained by adding traditional mortars with natural polymers to increase physico-mechanical performances", *Procedia Manufacturing*, 32(2019): 201-207.
4. Fernea Raluca; Manea Daniela Lucia; Plesa Luminita; Iernutan Razvan; Dumirtran, Mihaela. "Acoustic and thermal properties of hemp-cement building materials", *Procedia Manufacturing*, 32(2019): 208-215.
5. Florea Iacob; Jumate Elena; Manea Daniela Lucia; Fechet Radu. "NMR Study on New Natural Building Materials", *Procedia Manufacturing*, 32(2019): 224-229.
6. Denes Orsolya; Florea Iacob; Manea, Daniela Lucia. "Utilization of Sheep Wool as a Building Material", *Procedia Manufacturing*, 32(2019):236-241.
7. Orban, Yvette Anna; Manea, Daniela Lucia; Aciu, Claudiu, "Study of methods for simulating multiphase construction materials", *Procedia Manufacturing*, 22(2018): 256-261.
8. Orban, Yvette Anna; Manea, Daniela Lucia; Aciu, Claudiu; et al., "Virtual manufacturing and mechanical properties of synthetic fiber-reinforced mortars". *Procedia Manufacturing*, 22(2018): 262-267.
9. Aciu Claudiu; Ilutiu-Varvara Dana-Adriana; Manea Daniela-Lucia; Orban Yvette-Anna; Babota Florin. "Recycling of plastic waste materials in the composition of ecological mortars", *Procedia Manufacturing*, 22(2018): 274-279
10. Jumate, E.; Aciu, C.; Manea, D. L.; et al., "Plastering Mortar with Antibacterial and Antifungal Properties Studied By H-1 NMR relaxometry", *AIP Conference Proceedings*, Vol. 1917, Published: 2017.
11. E. Jumate, D. Moldovan, D. Manea, D. Demco, R. Fechet, "The Effects of Cellulose Ethers and Limestone Fillers in Portland Cement-Based Mortars by H-1 NMR relaxometry," *Applied Magnetic Resonance*, 47(2016):1353–1373.
12. L. Molnar, D. Manea, "New Types of Plastering Mortars Based on Marble Powder Slime", *Procedia Technology*, Elsevier, Vol.22, pp.251-258, 2016.
13. C. Aciu, C. Roman, D.A. Iluțiu - Varvara, C. Puia, O. Cadar. Plastering Mortar with Antibacterial and Antifungal Properties. *Romanian Journal of Materials* 2016, 46 (2):160 – 166.
14. E. Jumate, D. Moldovan, D. Manea, D. Demco, R. Fechet. The Effects of Cellulose Ethers and Limestone Fillers in Portland Cement-Based Mortars by 1H NMR relaxometry. *Applied Magnetic Resonance*, 47(2016): 1353-1373.
15. Claudiu Aciu, Daniela Lucia Manea, Cosmin Strilețchi, "The Ecomat Program for the Selection of Ecological Materials in Order to Ensure a Healthy Built Environment", *Procedia Technology* 19(2015): 490–497.
16. Claudiu Aciu, Daniela Lucia Manea, Carmen Puia, Oana Cadar, "Mortars for the Enhancement of the Indoor Environmental Quality", *STUDIA UBB CHEMIA*, LX, 4/2015:45 – 54, 2015.
17. Claudiu Aciu, Daniela Lucia Manea, Luminita Monica Molnar, Elena Jumate, "Recycling of Polystyrene Waste in the Composition of Ecological Mortars", *Procedia Technology* 19(2015):498–505, DOI: 10.1016/j.protcy.2015.02.071.
18. Elena Jumate, Daniela Lucia Manea, Claudiu Aciu, Luminita Molnar, Radu Fechet, "Innovative Materials Made by Adding Cellulose Ethers to Cement Mortars", *Procedia Technology* 19(2015): 291–298.
19. D.A. Iluțiu Varvara, L. Brândușan, G. Arghir, E. Pică, "Researches about the characterization of metallurgical slags for landfilled wastes minimization". *Environmental Engineering and Management Journal*, 14(2015):2115-2126.

The offer addressed to the economic environment

Research & development	Research & development in core areas Fundamental domain Civil Engineering – modern techniques and methods used in building materials quality control. Research & development in applied fields Green building materials. Recovery of industrial waste in construction materials. Influence of construction materials on health and environment. Development strategy The research and development activities of the research group are focused on: - contracts with third parties, research in the fields of building materials; - publishing articles in national and international journals indexed BDI and ISI; - participating in conferences, products presentations or technology development in the field of Civil Engineering.
Consulting	Quality control of building materials. Consultancy and applied research for the industrial or academic environment, according to the skills of the group members.
Applied engineering services	The Building Materials laboratory is part of the Central Laboratory of the Faculty of Civil Engineering and can issue quality certificates (test reports) for the authorized profiles. Tests on building materials (natural stone, aggregates, plaster, lime, cement, mortar, ceramic products, bitumen and bitumen impregnated materials etc.). Determination of the specific surface using Blaine permeameter. Determination of mechanical strengths of building materials (tensile, flexural and compressive strength) Observation of the behaviour of structures in real-time using non-destructive methods.
Training	Specialized courses in quality control of building materials. Training courses in the field of special rehabilitation materials.

TRANSPORT SYSTEMS RESEARCH GROUP

Contact details

Name	Transport Systems Research Group
Acronym	TSRG
Logo	
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Faculty Department	Faculty of Civil Engineering Railways, Roads and Bridges Department (CFDP)
Telephone, Fax	+40 264 401969, +40 264 592072
Director	Prof. Dr. Eng. Mihai ILIESCU
e-mail	Rodica.CADAR@infra.utcluj.ro mihai.dragomir@cfdp.utcluj.ro

Areas of expertise

Intelligent Transport Systems – monitoring activity with GPS and weight-in-motion systems.

Transport impact on urban mobility – survey deployment and analysis, transport macroscopic modeling.

Economic, health and environmental impacts of transport systems; – congestion analysis, population safety and exposure, environmental impact assessment. Intermodal regional transport; Integrated transport and land-use planning – modal distribution analysis, modal shift policies;

Laboratory testing and field studies for road structures and materials

Raw materials innovation for the circular economy - sustainable processing, reuse, recycling and recovery schemes

Team

Prof.Dr.Eng. Mihai ILIESCU; Assist. Prof.Dr.Eng. Cadar Rodica, Assoc. Assist. Prof.Dr.Eng. Mihai Liviu Dragomir ; Prof. Dr.Eng. Gavril Hoda ; Assist. Prof.Dr.Eng. Andrei Florin Clitan; Assist. Prof.Dr.Eng. Ciocan Remus; ssist. Dr. Eng. Toşa Cristian, Assist. Dr. Eng. Boitor Melania; Assist. Dr. Eng. Beca Ilinca Mirela; Assist. Prof.Dr.Eng. Marusceac Vladimir, Assist. Prof.Dr.Eng. Danciu Alexandra, Technician/analys: Jecan Daciana

Representative projects

“Study on establishing the number of public transport taxi licenses in the city of Cluj-Napoca for the period 2020-2025”, contract with Cluj-Napoca Municipality 2019

“Traffic impact study for the urbanization area following the construction of County Emergency Clinical Hospital Sibiu” - Contract no. 40/ 2018, 2018-2019

“Design services of the new general urban plan and the local urban planning regulation of Apahida commune-traffic study”, contract with industry, 2018

“Experimental and numerical study on the performance of asphaltic concrete from the perspective of the thermal susceptibility and the value of the modulus of elasticity” - CICDI2017, ID 18, internal project financed by TUCN, 2017-2018

“Study on light stains at runway surface with asphalt road” – CICDI2017, ID5, internal project financed by TUCN, 2017-2018

“Mobility study to support the introduction of local public transport system in Floresti commune, Cluj County” - CONTRACT Nr. 20788/14.11.2012. Project study period: 3rd December 2012 - 28th February 2013

“Traffic study on rehabilitated county road” DJ 151 Km 45+810 – Km 126+712 between Mureş and Bistriţa Counties. Project study period: July 2013 - September 2013.

“Study of road asphaltic mixtures improved with bitumen additives”, Contract 8/18.10.2013, for C.N.A.D.N.R. S.A
THE ISSUE – “Traffic Health Environment Intelligent Solutions for Sustaining Urban Economies”, Associated partner within the North West Development Region of Romania. Starting October 2012.

Significant results

The most representative publications of the past 5 years:

1. Boitor, R. M., Cadar, R. D., Măran, P. D., Mannini, L., & Petrelli, M. (2019). A NEW TOOL FOR THE EVALUATION OF CO2 EMISSIONS FROM ROAD TRAFFIC: A CASE STUDY IN CLUJ-NAPOCA, ROMANIA. Environmental Engineering & Management Journal (EEMJ), 18(9). Online at <http://www.eemj.icpm.tuiasi.ro/issues/vol18/vol18no9.htm>, Indexed in Web of Science
2. The Speed - Flow Relationship on Urban Roads in A Romanian Town, Dorina, Cadar Rodica ; Melania, Boitor Rozalia ; Mihai, Dragomir ...More, 3RD WORLD MULTIDISCIPLINARY CIVIL ENGINEERING, ARCHITECTURE,

- URBAN PLANNING SYMPOSIUM (WMCAUS 2018), Volume 471 Published 2019
3. A ROAD TRAFFIC PREDICTION STUDY BASED ON WEIGH-IN-MOTION DATA, By: Ciont, Nicolae; Cadar, Rodica Dorina; Cimpean, Dalia Sabina, PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE Vol: 19, Issue: 4, Pp: 567-574, OCT-DEC 2018
 4. Aschilean, Ioan; Iliescu, Mihai; Ciont, Nicolae; et al., The Unfavourable Impact of Street Traffic on Water Distribution Pipelines, WATER Volume: 10 Issue: 8 Article Number: 1086 Published: AUG 2018
 5. Effects of Traffic Volumes on Accidents: The Case of Romania's National RoADSm By: Cadar, Rodica Dorina; Boitor, Melania Rozalia; Dumitrescu, Mara, GEOGRAPHIA TECHNICA Volume: 12 Issue: 2 Pp: 20-29, OCT 2017
 6. Iliescu, Mihai; Gutiu, Stefan I.; Moga, Catalin, Technological Problems regarding the Design and Execution of the new Bridge over Cibin River in the City of Sibiu and the Bridge Impact in Reducing Pollution in the City Center Area 10TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING, INTER-ENG, Tirgu Mures, ROMANIA, Book Series: Procedia Engineering Volume: 181 Pages: 20-27 Published: 2017
 7. Clitan, Andrei -Florin; Dragomir, Mihai-Liviu; Madalina, Ciotlaus; et al., Improving Traffic Conditions on a Set of Three Intersections Using Microscopic Simulation Models, Conference: 10th International Conference on Interdisciplinarity in Engineering (INTER-ENG) Location: Tirgu Mures, ROMANIA Date: OCT 06-07, 2016 INTER-ENG 2016 Book Series: Procedia Engineering Volume: 181 Pages: 139-145 Published: 2017
 8. Urban Mobility and Road User Behavior Assessment, By: Cadar, Rodica Dorina; Boitor, Rozalia Melania; Petrelli, Marco, Conference: 10th International Conference on Interdisciplinarity in Engineering (INTER-ENG) Location: Tirgu Mures, ROMANIA Date: OCT 06-07, 2016, 10TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING, INTER-ENG 2016 Book Series: Procedia Eng. Volume: 181 Pages: 116-122 Published: 2017
 9. Employing a Traffic Data Processing Software to Efficiently Design Road Pavements, By: Ciont, Nicolae; Iliescu, Mihai; Cadar, Rodica Dorina, Conference: 10th International Conference on Interdisciplinarity in Engineering (INTER-ENG) Location: Tirgu Mures, ROMANIA Date: OCT 06-07, 2016, 10TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING, INTER-ENG 2016 Book Series: Procedia Engineering Volume: 181 Pages: 868-875 Published: 2017
 10. TRAVEL BEHAVIOR ASSESSMENT FOR IMPROVED URBAN MOBILITY, By: Cadar, R. D.; Boitor, R. M.; Petrelli, M., Conference: 16th International Multidisciplinary Scientific Geoconference (SGEM 2016) Location: Albena, BULGARIA Date: JUN 30-JUL 06, 2016, Nano, Bio And Green - Technologies For A Sustainable Future Conference Proceedings, SGEM 2016, VOL II Book Series: International Multidisciplinary Scientific GeoConference-SGEM Pages: 771-778 Published: 2016

Products and technologies:

1. Road Traffic and Transport measurements:

Weight in motion system hi-trac 90, hi-trac 100, Laser TruCAM (All-in-one Digital Video Camera/Laser Speed and Ranging Device), MCLocator system for fleet management and location (6GPS vehicle test), Portable Skid Resistance Tester Device, GPS Leica GS09 NetRover RTK, GPS Data Logger Performance Meter, Weather Center Tehnoline WS 550, Sound Level Meter DeltaOHM HD2010UC, Infrared and Contact Thermometer FLUKE 561, Video camera Sony XR160E, Digital Camera Canon EOS1100D, QuickMap 3D (QM3D) 5.0 from Laser Technology; Transportation planning and traffic modelling software (Transyt, Arcady, Picady, VISUM, VISSIM), Programming language MATLAB, Graphing and data analysis software OriginPro.

2. Road materials/structures-laboratory and field studies:

Marshall test, Unitronic Frame, Proctor, Asphalt and Cement concrete: recipes, preparation and laboratory tests; Lucas plate test, Zorn plate test, Benkelman test; Bitumen tests (ductility, ball and ring, penetration, RTFOT).

The offer addressed to the economic environment

Research & development	<u>Research on traffic</u> safety and solution development; Development of traffic models (road network and junctions); Development of original solutions regarding survey structure for transport mobility studies in urban and rural areas; Development of statistical analyses for collected traffic data; <u>Research on ecological road materials</u> using recycled material or different waste materials (bricks, old pavements, old concrete form demolition etc.); Development of new road materials or different pavement solutions; Research on laboratory analyses on road materials and development of improved road materials.
Consulting	Technical assistance in projects; Consulting, design, research and assistance for infrastructural projects (roads, parking lots, bridges and railroads); Award of contracts in urban roads field. Valuation: investments, acquisitions, economic costs, financial reporting, sales. Public transport planning.
Applied engineering services	<u>Mobility studies</u> ; Road network capacity assessment; Air quality assessment; Spot speed studies for enforcement measures in the urban environment; Traffic studies regarding speed profiles and fleet composition; <u>Laboratory tests and reports on road materials</u> ; Field measurements: load capacity, deflections, flatness, core extractions; Analyze asphalt/cement concrete recipes – for different utilities: (road, playgrounds, bridge decks, parks alleys etc). Studies on stabilized materials (with different types of binder); Studies on mineral skeleton (the main part of all construction materials)
Training	Actual standards and legal framework in road construction; Rehabilitation projects and road rehabilitation methods; Traffic safety - Audit and Inspection Training.

BRIDGE ENGINEERING RESEARCH CENTER

Contact details

Name	Bridge Engineering Research Center
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Logo	
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Telephone	+4 0264 401 838
Fax	
Director	Assoc. Prof. Dr. Eng. Stefan I. Gutiu
e-mail	Stefan.Gutiu@cfdp.utcluj.ro



Areas of expertise

Tests for bridges and rail superstructures
Composite bridges, Steel bridges design and rehabilitation
Nielsen and network arch bridges – design and optimization techniques,
Truss structures – structural optimization
Design of bridges and art works, structural health monitoring and technical expertise
Concrete and wood bridges – design and rehabilitation

Team

Assoc. Prof. Dr. Eng. Stefan I. Gutiu, Assist. Prof. Dr. Eng. Catalin Moga, Assist. Prof. Dr. Eng. Alexandra Danciu, Assist. Prof. Dr. Eng. Mircea Suci, Assist. Prof. Dr. Eng. Vladimir Marusceac

Representative projects

„Technological Study on Technical Expert Services, SF, PTDE, Technical Assistance from the Designer for Capital Repair "Bridge over Mures river with overpass over CF Deda-Tg.Mures line", contract with industry, 2016-2019, Director: Assist. Prof. Dr. Eng. Alexandra Danciu
„Study on Safety Assessment in Operation of Unfinished Construction Hotel S + GF + 10E in Com. Constanta”, contract with industry, (2017-2018)
„Develop National Annex SR EN 1994-2:2006”, Contract no. 307/27.11.2007, Director: Prof. dr. eng. Radu Băncilă, "Politehnica" University of Timisoara. Beneficiary Ministry of Development, Public Works and Housing MDLPL TECHNICAL –Direction
„Review manual inspection of bridges. Indicative A.1.6.2./T5”, Contract No. 58 / 02.10.2002, Contract Director Prof.dr.ing. Viorel Gabriela, Bucharest Beneficiary CESTRIN

Significant results

Articles in ISI rated journals, in the past 5 years:

1. Șt. I. GUȚIU, C. MOGA, Alexandra DANCIU: *Considerations regarding roadway steel bridges connections using bolts and end plates*, The Eight International Conference "Bridges in Danube Basin" 25-27 September 2019, Vienna, Austria, ISBN: 978-3-9502387-2-3
2. Șt. I. GUȚIU, P. MOGA, C. MOGA Alexandra DANCIU: *The new arch bridge in the city of Sibiu, Romania*, The 9th International Conference "Bridges in Danube Basin", 2016, published in "Procedia Engineering 156 (2016)" ELSEVIER, ISSN 1877-7058, DOI 10.1016/j.proeng.2016.08.259, p. 132-139, <http://authors.elsevier.com/sd/article/S1877705816324456>, WOS:000383246700019
3. P. MOGA, Șt. I. GUȚIU, F. ANGHEL, C. MOGA Alexandra DANCIU: *Footbridge over the Somes River in Cluj-Napoca, Romania*, The 9th International Conference "Bridges in Danube Basin", 2016, published in "Procedia Engineering 156 (2016)" ELSEVIER, ISSN 1877-7058, DOI 10.1016/j.proeng.2016.08.259, p. 249-256, <http://authors.elsevier.com/sd/article/S1877705816324651>, WOS:000383246700034

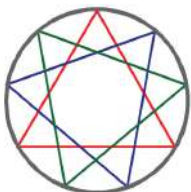
4. Șt. I. GUȚIU, C. MOGA, Alexandra DANCIU, M. SUCIU: *Constructive solutions for medium span footbridges*, 16th International Multidisciplinary Scientific Geoconference (SGEM 2016), Nano, Bio and Green – Technologies for a Sustainable Future, 30 june-6 july, 2016, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-69-8, ISSN 1314-2704, DOI:10.5593/sgem2016B62, pp 517-524, WOS:000391650000063
5. Șt. I. GUȚIU, C. MOGA, Alexandra DANCIU: *Elastic and plastic design of composite steel-concrete girders with circular holes*, 16th International Multidisciplinary Scientific Geoconference (SGEM 2016), Nano, Bio and Green – Technologies for a Sustainable Future, 30 june-6 july, 2016, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-69-8, ISSN 1314-2704, DOI:10.5593/sgem2016B62, pp 549-556, WOS:000391650000072
6. C. MOGA, Șt. I. GUȚIU, Alexandra DANCIU, M. SUCIU: *Concrete shrinkage stresses and thermal effects in the composite girders according to Eurocodes*, 16th International Multidisciplinary Scientific Geoconference (SGEM 2016), Nano, Bio and Green – Technologies for a Sustainable Future, 30 june-6 july, 2016, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-69-8, ISSN 1314-2704, DOI:10.5593/sgem2016B62, pp 501-508, Accession Number: WOS:000391650000066
7. Alexandra DANCIU, Șt. I. GUȚIU, C. MOGA: *Bi-dimensional analysis of a 90 m arch with different hanger arrangements*, 16th International Multidisciplinary Scientific Geoconference (SGEM 2016), Nano, Bio and Green – Technologies for a Sustainable Future, 30 june-6 july, 2016, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-69-8, ISSN 1314-2704, DOI:10.5593/sgem2016B62, pp 477-484, Accession Number: WOS: :000391650000063
8. Șt. I. GUȚIU, C. MOGA: *Bending Resistance of a Slender Plate Girder With Longitudinal Stiffener*, 4th International Conference on Civil Engineering, Architecture and Building Materials, CEABM 2014, 24-25 May, Haikou, China, Source: ADVANCES IN CIVIL AND INDUSTRIAL ENGINEERING IV, Book Series: Applied Mechanics and Materials, Volume: 580-583, Pages: 2332-2335, DOI: 10.4028/www.scientific.net/AMM.580-583.2332, Web of Science Categories: Engineering, Industrial; Engineering, Civil; Materials Science, Multidisciplinary; Mechanics Research Areas: Engineering; Materials Science; Mechanics, Published: 2014, Trans Tech Publications, Switzerland, IDS Number: BC0BQ, ISSN: 1660-9336, ISBN: 978-3-03835-165-8, Accession Number: WOS:000348897703057
9. Șt. I. GUȚIU, C. MOGA, Alexandra DANCIU: *Composite steel concrete trusses for railway bridge superstructures*, 14th GeoConference on Nano, Bio and Green – Technologies for a Sustainable Future, SGEM 17-26 june, 2014, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-21-6, ISSN 1314-2704, DOI:10.5593/sgem2014B62, pp 73-80, Accession Number: WOS:000366135800010
10. C. MOGA, Șt. I. GUȚIU, Alexandra DANCIU: *Influence of cross-sectional shape on the values of the critical buckling force*, 14th GeoConference on Nano, Bio and Green – Technologies for a Sustainable Future, SGEM 17-26 june, 2014, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-21-6, ISSN 1314-2704, DOI:10.5593/sgem2014B62, pp 219-226,
11. C. MOGA, Șt. I. GUȚIU, Alexandra DANCIU: *Shear stresses transfer at the steel-concrete interface in circular concrete filled steel tubes*, 14th GeoConference on Nano, Bio and Green – Technologies for a Sustainable Future, SGEM 17-26 june, 2014, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-21-6, ISSN 1314-2704, DOI:10.5593/sgem2014B62, pp 613-620, Accession Number: WOS:000366135800079
12. Alexandra DANCIU, D. DANCIU, C. MOGA, Șt. I. GUȚIU: *Evolutionary method for re-triangulation*, 14th GeoConference on Nano, Bio and Green – Technologies for a Sustainable Future, SGEM 17-26 june, 2014, Bulgaria, Conference Proceedings, Volume II, Green buildings technologies and materials; Green design and sustainable architecture, ISBN 978-619-7105-21-6, ISSN 1314-2704, DOI:10.5593/sgem2014B62, pp 145-152,

The offer addressed to the economic environment

Research & development	Research & development in core areas: Fundamental domain Civil Engineering – design, technical expertise and rehabilitation of composite, steel, concrete and timber bridges. Research & development in applied fields: - Design of steel members; - Study of the behaviour of corrugated webs; - Development of glulam elements; - Optimisation of network arch bridges; - Design of steel joint. Development strategy: National and International research contracts, contracts with third party, article publishing in Journals (WOS, SCOPUS with impact factor), National and International conference participations, workshops, products presentation or technology development in the field of Bridge Engineering;
Consulting	Design, technical expertise and erecting of bridges. Applied research for the industrial or academic environment, according to the skills of the group members.
Training	Training courses in the field of modern software for computer aided design (CAD). Training courses in the use of software for numerical simulations such as: Midas, Prokon, Sofistik, CSI Bridge.

LIGHTING – ELECTRICAL - LABORATORY

Contact details

Name	Lighting - Electrical - Laboratory
Acronym	LEL
Logo	
Site	http://users.utcluj.ro/~lec
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Director	Dr.eng. Dorin BEU, Assoc. Professor
e-mail	Dorin.beu@insta.utcluj.ro



Areas of expertise

Electric Lighting: 3D building simulations for the illumination levels using DIALux EVO 8.2; lighting measurements; energy efficiency lighting solutions;

Daylight: software building simulations for the daylight levels; lighting measurements; passive tubular daylight guidance systems;

Lighting Surveys: on the use of T8, T5, CFLs, LEDs;

Power quality: Power quality measurements for different end use devices, including LED luminaires;

Circular economy and regenerative Building: Studying the specific aspects related with green / active building services; carbon footprint reduction;

Renewable energies: hybrid lighting systems using photovoltaics; electrical design and testing of photovoltaic systems;

Team

Dr. Eng. Dorin BEU, Reader at the Technical University of Cluj-Napoca. Former President of Romanian Green Building Council RoGBC (www.rogbc.org) and of Romanian National Lighting Committee (www.cnri.ro). Chief Editor together with prof. Kim from Seoul Kyun Hee University of International Journal of Sustainable Lighting (www.lightingjournal.org); Prof. Dr. Eng. Mircea BUZDUGAN, Lecturer. Dr. Eng. Calin CIUGUDEANU, PhD student Eng. Angel CAMPIANU; dr.eng. Horatiu ALB

Representative projects

“CoME EAsy” 2018-2021 H2020 project for synchronizing EEA and Covenant of Mayor <https://www.european-energy-award.org/eu-project-come-easy>, finding the best KPIs for city energy and climate management and conversion tables for one system to another;

COST RESTORE 2017-2021 CA 16114 www.eurestore.eu, in charge with Training School finding solutions for regenerative buildings – concept, design, tender, maintenance;

“Ensuring LEC maintenance by detecting defects with the method of real-time reflectometry”, Contract 171CI/2018, Cod PN-III-P2-2.1-CI-2018-1004, 2018;

“Procedures for testing the protection systems equipped with digital relays, when commissioning substations in the national energetic system” cod PN-III-P2-2.1- CI-2017-0799, NR. 147CI/2017;

“LoNNE” 2012-2016-member COST action ES 1204 – LoNNE Loss of Night Network (Manager of National Committee) <http://www.cost-lonne.eu/> study of the impact of Artificial Light At Night on humans and on environment;

“Energy - Efficient Technologies for a Green University” in the program „Strategic research themes for young teams, Technical University of Cluj-Napoca, UTC-N”, 2014-2015;

„Modernization and the Extension of Public Lighting System and the Modernization of the Lighting System in two buildings of the City Hall” DALI and FPP, Contract nr. 380333/14.11.2013, UTC-N – City of Cluj-Napoca, cooperation program Switzerland-Romania;

“CREFEN” Project Ceex 2005 - 2008 - PC-D05-PT00-303: “Informatic Integrated System for Energy Efficiency and Saving in Residential Sector - CREFEN”;

“ENERLIN - Lighting Energy Efficiency Initiative“ contract EISAV/EIE/05/176/2005, : <http://www.enerlin.enea.it>, 2006-2008;

Significant results

1. Ciugudeanu C, Buzdugan M, Beu D, Campianu A, Galatanu C, **Sustainable Lighting-Retrofit Versus Dedicated Luminaires-Light Versus Power Quality**, Sustainability, 2019, 11(24), 125; <https://doi.org/10.3390/su11247125>
2. [Galatanu, CD](#) ; [Ashraf, M](#) ; [Lucache, DD](#); [Beu, D](#), Ciugudeanu, C. **Optical Utilization Factor For Architectural Lighting**, LIGHT & ENGINEERING. Volume: 27 Issue: 6, Pages: 49-57 DOI: 10.33383/2017-101Published: 2019
3. Beu, D; Ciugudeanu, C; Buzdugan, M. **Circular Economy Aspects Regarding LED Lighting Retrofit-from Case Studies to Vision**, SUSTAINABILITY Volume: 10 Issue: 10 Article Number: 3674 DOI: 10.3390/su10103674, Published: OCT 2018;
4. Galatanu, C.D; Gherasim, I; Beu, D; Lucache, D.D; **Luminance field of the facades: from aggressive to attractive lighting**, 2018 IEEE INTERNATIONAL CONFERENCE ON ENVIRONMENT AND ELECTRICAL ENGINEERING AND 2018 IEEE INDUSTRIAL AND COMMERCIAL POWER SYSTEMS EUROPE (EEEIC / I&CPS EUROPE Book Group Author(s):IEEE Published: 2018;
5. Ciugudeanu, C; Beu, D; Rastei, E; **Living Building Laboratory - Educational Building Project in Cluj-Napoca**, EENVIRO-YRC 2015 – BUCHAREST, Edited by: Damian, RM Book Series: Energy Procedia Volume: 85 Pages: 125-131 DOI: 10.1016/j.egypro.2015.12.282 Published: 2016;
6. Ciugudeanu, C; Beu, D; **Passive Tubular Daylight Guidance System Survey**, 9TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING, INTER-ENG 2015, Edited by: Moldovan, L Book Series: Procedia Technology Volume: 22 Pages: 690-696 DOI: 10.1016/j.protcy.2016.01.144 Published: 2016
7. Beu, D; Ciugudeanu, C; Maieran, M; Galatanu, C.D; **Introducing a New Profession: Lighting Specialist**, ECOLOGY, ECONOMICS, EDUCATION AND LEGISLATION CONFERENCE PROCEEDINGS, SGEM 2016, VOL III, Book Group Author(s):SGEM Book Series: International Multidisciplinary Scientific GeoConference-SGEM Pages: 863-869 Published: 2016;
8. Beu, D; Ciugudeanu, C; Gyulai, R; **Light Guiding Optical Lamellae System Simulations**, The 16th International Multidisciplinary Scientific Geoconference (SGEM 2016) Location: Albena, BULGARIA Date: JUN 30-JUL 06, 2016;
9. Balan, H; Tirnovan, R; Buzdugan, M; **Commutation technique in the supply of electromagnetic actuators**, IET POWER ELECTRONICS Volume: 7 Issue: 1 Pages: 132-140 Published: JAN 2014;
10. Horia, B; Augustin, P.A; Mircea, B; Ioan, B; **Analysis of multilevel converters operation through programmable source emulators**, The 49th International Universities Power Engineering Conference (UPEC), Published: 2014;
11. Horia, B; Mircea, B; Ioan, B; Augustin, P.A; **Modeling and Simulation of Current Digital Relays**, The 49th International Universities Power Engineering Conference (UPEC) Published: 2014;
12. Buzdugan, M; Munteanu, R. A; **Influence of Harmonics on Heat Recovery Equipment**, The International Conference on Applied and Theoretical Electricity (ICATE) Location: Craiova, ROMANIA Date: OCT 04-06, 2018;
13. Balan, H; Pop, A.A; Buzdugan, M; Munteanu, R.A; **Performances Optimization and Characteristics of the Voltage Generated by Multilevel Inverters**, International Conference on Applied and Theoretical Electricity, (ICATE), Published: 2014;
14. Buzdugan, M.; Balan, H.; **Performances of the Anti-Perturbation Filters for Current Distortion Factor Reduction**, International Conference on Applied and Theoretical Electricity (ICATE), Published: 2014;

Significant solutions:

Hybrid Passive Tubular Daylight Guidance System;

Living Building Laboratory - build design for the first Romanian active building (a building that produce more energy than its own consumption), using traditional materials combined with the latest technologies;

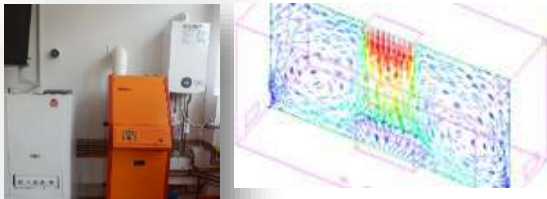
Switzerland financial support approval (1.8 million euro) for the Final Project Proposal - Modernization and the Extension of Public Lighting System of the Cluj-Napoca City Hall;

The offer addressed to the economic environment

Research & development	Supporting local lighting businesses to be more competitively on the market by using applied research; Providing and evaluating the best available techniques on the market; Evaluating and testing different new luminaires and their power quality behaviour;
Consultancy	Consulting, design, research and prototyping towards the development of different energy efficiency lighting techniques.
Design	Preparing lighting/electrical documentations for all the design phases: feasibility studies, final project proposals, technical projects, specifications and As-built;
Measurements	Lighting measurements; power quality measurements; electro-magnetic field measurements; thermo-visual surveys; earthing installation and earth resistivity; photovoltaics efficiency under different climatic conditions.
Training	Courses for Lighting Specialist. Energy efficiency lighting techniques, electrical design; lighting and power quality measurements.

SYSTEMS FOR PROVIDING INDOOR COMFORT IN ENERGY EFFICIENT BUILDINGS RESEARCH GROUP

Contact details

Name	Systems for Providing Indoor Comfort in Energy Efficient Buildings Research Group	
Acronym	SICEEB	
Logo		
Site		
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Faculty Department	Faculty of Building Services Department of Building Services Engineering	
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Director	Assoc. Prof. Dr. Eng. Florin DOMNIȚA	
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Areas of expertise

Heating ventilation and air conditioning (HVAC): Thermal analysis on heating and cooling units; Air distribution in ventilation systems; Systems for providing indoor air quality; HVAC systems for passive houses and near zero energy buildings (nZEB).

Indoor air quality (IAQ): air cleanness; chemical composition of indoor air; indoor air movement.

Thermal comfort: indoor air parameters; outdoor-indoor heat exchange, finite element thermal analysis.

Energy efficient systems: - air to air heat recovery; ground to air and water to air heat exchangers; heat pumps.

Renewable energies: Photovoltaic (PV) panels with crystalline and amorphous layers; Vacuum tube and thermal solar collector; geothermal energy sources; wind turbines;

Thermal storage: Latent heat thermal energy storage; phase change materials; cold storage for free cooling; thermal storage in hot and cold water tanks.

Team

Assoc.Prof.Dr.Eng. Florin DOMNIȚA, Assoc.Prof.Dr.Eng. Gheorghe Viorel DRAGOȘ, Assoc.Prof.Dr.Eng. Carmen MÂRZA, Assoc.Prof.Dr.Eng. Ciprian BACOTIU, Assoc.Prof.Dr.Eng. Anuța ABRUDAN, Assoc.Prof.Dr.Eng. Eugen VITAN, Assoc.Prof.Dr.Eng. Cornel MUNTEA, Assoc.Prof.Dr.Eng. Ioan POP, Lect.Dr.Eng. Gelu CHISĂLIȚĂ, , Lect.Dr.Eng. Anca HOȚUPAN, Lect.Dr.Eng. Teodor CHIRA, Lect.Dr.Eng. Raluca MOLDOVAN, Lect.Dr.Eng. Georgiana CORSIUC, Lect.Dr.Eng. Tania RUS, Lect.Dr.Eng. Roxana MARE, Asist.Dr.Eng. Octavian POP, Asist.Dr.Eng. Constantin CILIBIU, Drd.Eng. Radu MĂNESCU.

Representative projects

“Energy efficiency of air cooling systems by using phase changer materials”, CICDI 2017, nr.2013/12.07.2017;
 “Meeting of Energy Professional Skills (MEsS) - Energy analysis techniques and practices for implementing near zero energy buildings (nZEB)”, Project HORIZON 2020-EE-2014-2015, nr. 649773/30.03.2015; 2015-2017;
 “Energy Efficient Technologies for a Green University”; CICDI 2014, nr. 29223/05.12.2014, 2014-2015;
 “Energy efficiency of ventilation systems”, nr. 6079/04.03.2011; Program nr. 15-SK-RO-0010-10, code 3.5; 2011-2012;
 “The thermal rehabilitation of 25 kindergartens in Arad and Timiș Counties”, nr. S/PRET/17/2011, 2011-2012;
 “Optimized system for the production of thermal energy from renewable energy sources using heat pumps”, PNCDI2 OPTHP 22-128, 2010.

Significant results

The most representative publications of the past 5 years:

1. Peter Kapalo, Ludmila Meciarova, Silvia Vilcekova, Eva Kridova Burdova, Florin Domnita; Ciprian Bacotiu; Kinga-Eva Peterfi, Investigation of CO₂ production depending on physical activity of students. *International Journal of Environmental Health Research*, Volume 29, Issue 1, 2019, WOS:000457284700003, pp. 31-44, ISSN: 0960-3123, **IF 1.465/2018**.
2. Anuța Abrudan, Octavian Pop, Alexandru Serban, Mugur Bălan, New perspective on performances and limits of solar fresh air cooling in different climatic conditions. *Energies*, 2019, 12/11, 2113; ISSN1996-1073, **IF 2,67/2018**.

3. Florin Domnița, Peter Kapalo; Inlet device with double exponential profile distributor for indoor air dispensation. *Selected Scientific Papers – Journal of Civil Engineering*, Volume 14, Issue 1, 2019, pag. 103-112, ISSN 1336-9024, DOI: 10.1515/sspjce-2019-0011.
4. Roxana Mare, Adriana Hadarean, Tania Rus, Dana Ilutiu-Varvara, Teodor Chira, Modelling of an Improved Hybrid Cooler Used in Sustainable Buildings, *IOP Conf. Series: Materials Science and Engineering*, 471, 2019, 022032, doi:10.1088/1757-899X/471/2/022032.
5. Octavian Pop, Lucian Tutunaru, Florin Bode, Ancuța Abrudan, Mugur Bălan, Energy efficiency of PCM integrated in fresh air cooling systems in different climatic conditions. *Applied Energy*, vol 212, pag.976-996, 2018, DOI: 10.1016/j.apenergy.2017.12.122 ISSN 0306-2619, **IF 8.426/2018**.
6. Ancuța Abrudan, Tania Rus, Roxana Mare, Thermal rehabilitation influence upon the comfort in hospitals, 5th *International Conference on Advancements of Medicine and Health Care through Technology (MEDITECH)*, October 2016, Cluj-Napoca, *IFMBE Proceedings*, Volume: 59, pag.155-158 DOI: 10.1007/978-3-319-52875-5_35.
7. Peter Kapalo; Florin Domnița; Ciprian Bacotiu; Martin Podolak, The influence of occupants' body mass on carbon dioxide mass flow rate inside a university classroom - case study. *International Journal of Environmental Health Research*, Volume 28, Issue 4, 2018, WOS:000439887900007, pp. 432-447, ISSN: 0960-3123, **IF 1.465/2018**.
8. Tania Rus, Lucian Rus, Dana Iluțiu-Varvara, Roxana Mare, Ancuța Abrudan, Florin Domnița, Experimental Investigation on the Influence of Overlap Ratio on Savonius Turbines Performance. *International Journal of Renewable Energy Research*, Volume 8, Issue 3, 2018, WOS:000444037500037, pp. 1791-1799, ISSN 1309-0127.
9. Peter Kapalo; Florin Domnița; Ciprian Bacotiu; Nadia Spodyniuk, The impact of carbon dioxide concentration on the human health - case study. *Journal of Applied Engineering Sciences*, Volume 8, Issue 1, 2018, WOS:000442423900008, pp. 61-66, ISSN: 2284-7197.
10. Mârza C., Corsiuc G, Molvovan R., Dragos V., The concept of autonomous building in the context of sustainable development, *Bulletin of The Transilvania University of Brasov*, VOL. 11 (60) Special Issue No.1 – 2018, Series I: Engineering Sciences, Proceeding of the International Scientific Conference „CIBV 2018”, 2018, Brasov, pp. 349-356, ISSN 2065-2127.
11. Pop O.G., Iuga C.A., Tutunaru L.F., Balan M.C., Modeling and experimental validation of the thermal behaviour of PCM using DSC input data, AIP Conference 2018, *International Conference on Energy Engineering and Smart Materials* 2018, Milano.
12. Domnița, F., Moldovan, R.P., Kapalo, P., Rus, T., Ilutiu-Varvara, D.A., Energy efficiency evaluation of a controlled ventilation system with Canadian well for low energy houses - Case study, *17th International Multidisciplinary Scientific Geoconference*, SGEM 2017, Albena, Bulgaria, 2017, ISBN 978-619-7105-15-5, pp 231-238.
13. O. Pop, M. Balan, L. Fechet Tutunaru, Numerical model for solidification and melting of PCM encapsulated in spherical shells, *Energy Procedia* 112, 2017, p.336 343, ISSN: 1876 6102.
14. Rus, T., Rus, L.F., Abrudan, A.C., Domnița, F., Mare, R., Experimental Tests in Equipping Vertical Axis Wind Turbines with Electric Generator, *International Journal of Renewable Energy Research*, 6/2, pp 465-471, 2016 ISSN: 1309-0127, WOS:000378520200013.
15. Domnița, F., Muntea, C., Ilutiu Varvara, D., Rus T., Beu D., Simplified methodology for evaluation the energy efficiency of led luminaires, *16th International Multidisciplinary Scientific Geoconference (SGEM 2016)*, Energy and clean technologies conference proceedings, Albena, Bulgaria, Iunie, 2016, ISBN 978-619-7105-15-5, pp 631-638 WOS:000391348600082.
16. Ceuca E., Corsiuc G., The Smart City - integrated green energy system, *Proceedings of 38th International Spring Seminar on Electronics Technology ISSE*, 2015, DOI: 10.1109/ISSE.2015.7248028, Eger, Ungaria, p. 390–395.

Significant solutions:

Indoor CO₂ concentration measurements depending on activities, methods for determining fresh air supply, mathematical model for fresh air flow rate-based on statistics, energy evaluation of ground air heat exchanger, thermal rehabilitation of buildings, mathematical model for latent heat thermal energy storage, accurate modelling of thermo-physical properties of PCM, optimisation of heat pumps with renewable energy sources, mathematical model for hybrid coolers, methodology for evaluation of led luminaires.

Products and technologies:

1. Double-Equal Strength Diffuser for air distribution
2. Efficient hybrid cooler
3. Energy audit of buildings
4. Savonius Turbines
5. Algorithm for selecting phase change materials based on climatic conditions
6. Adiabatic chamber for thermal analysis of LED luminaires
7. Software for evaluating heat gains through opaque building elements in transient sinusoidal regime

The offer addressed to the economic environment

Research & development	Research & development in core areas: Fundamental domain Building Services Engineering – technologies for assuring comfort and IAQ. Research & development in applied fields: nZEB, thermal energy recovery coupled with renewable sources, Influence of CO ₂ concentrations on health and environment, thermal storage. Development strategy: National/International research contracts, contracts with third party, article publishing in Journals (WOS, SCOPUS), National/International conference participations, products presentations or technology development in the field of Building Services Engineering.
Consulting	Design, energy audit, consulting, research, product testing, HVAC systems air-flow balancing, sound comfort analysis, thermal infrared analysis, evaluation of thermal comfort parameters.
Training	HVAC systems in nZEB, Courses for energy audit, Courses focused on IAQ and renewable energies.

ENVIRONMENTAL QUALITY ANALYSIS AND BUILDING SERVICES MATERIALS RESEARCH GROUP

Contact details

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e-mail	Dana.Adriana.Varvara@insta.utcluj.ro	



Areas of expertise

Environmental factors pollution control; Environmental parameters monitoring; Environmental quality; Indoor air quality (IAQ); Outdoor air quality (OAQ); Quality of industrial microclimate; Prediction of the environmental quality factors; Industrial wastes; Hazardous wastes; Wastes recycling; Sustainable development; New materials with special properties; Advanced materials; Materials for building services engineering; Materials chemistry; Applied chemistry; Environmental chemistry.

Team

Assoc. Prof. Dr. Eng. Dana - Adriana ILUȚIU - VARVARA, Assoc. Prof. Dr. Eng. Carmen Maria MÂRZA, Assoc. Prof. Claudiu ACIU, Lecturer Dr. Eng. Adriana HĂDĂREAN, Lecturer Dr. Marius FETEA, Lecturer Dr. Ioan GIURCA, Lecturer Dr. Anca HOȚUPAN, Lecturer Dr. Teodor Valeriu CHIRA, Lecturer Dr. Eng. Raluca - Paula MOLDOVAN, Lecturer Dr. Anagabriela DEAC, Lecturer Dr. Cristina IACOB, Lecturer Dr. Daniel RUSU, Lecturer Dr. Eng. Georgiana - Dorina CORSIUC, Lecturer Dr. Eng. Roxana MARE, Lecturer Dr. Eng. Tania RUS, Lecturer Dr. Ioana – Monica SAS – BOCA, Lecturer Dr. Marius TINTELECAN, Assist. Prof. Dr. Constantin CILIBIU.

Representative projects

"Studies and researches regarding the reduction of the negative environmental impact of the pollutants and solid wastes from the steelmaking", "Development and support of multidisciplinary postdoctoral programmes in major technical areas of national strategy of Research - Development - Innovation" **4D-POSTDOC**, contract no. POSDRU/89/1.5/S/52603, project co-funded by the European Social Fund through Sectoral Operational Programme Human Resources Development 2007-2013, <http://193.226.17.4:8080/sites/fordoc/default.aspx> (2010-2013).
"Creation of a cooling solar thermoelectric installation (ITERMSOR)", Internal competition for Research/ Development/ Innovation – Project 16671/12.07.2017, type 1.2 – CI2017_INST_1 (33/2017), Technical University of Cluj-Napoca (2017-2018).
"Research concerning the characterization of the oily mill scale in order to identify a optimum method for reduction of the quantities of hazardous wastes landfilled", Internal competition for Research/ Development/ Innovation – Project 16362/07.07.2016, C.I. type 1.1 - T4, Technical University of Cluj-Napoca (2016-2017).
"Studies of methods to optimize the use of sludge in the building materials industry", Internal competition for Research/ Development/ Innovation. Project C.I. type 1.1-T5 / 2016, Technical University of Cluj-Napoca (2016-2017).

Significant results

The most representative publications of the past 5 years:

1. D. A. Iluțiu – Varvara, M. Tintelecan, C. Aciu, I. M. Sas – Boca, A. Hădărean, T. Rus, R. Mare, "An Assessment of the Substance Losses from Charge Composition Used to the Steelmaking – Key Factor for Sustainable Steel Manufacturing". *Procedia Manufacturing*, vol. 32, 2019, pp. 15-21.
2. R. Mare, A. Hădărean, T. Rus, D. A. Iluțiu – Varvara, T. V. Chira, "Modelling of an Improved Hybrid Cooler Used in Sustainable Buildings". *Materials Science and Engineering* 471 (2019) 022032.

3. C. Aciu, D. A. Iluțiu – Varvara, D. L. Manea, Y. A. Orban, F. Babota, "Recycling of Plastic Waste Materials in the Composition of Ecological Mortars". *Procedia Manufacturing*, vol. 22, 2018, pp. 274-279.
4. I.M. Sas – Boca, D. I. Frunza, D. A. Iluțiu – Varvara, I. Toma, "The Properties of Bimetallic Multi-layer (C45 and S235JR) and the Multi-layer Steel Made by Forging". *Powder Metallurgy And Advanced Materials*, vol. 8, 2018, pp.11-17.
5. M. Tintelecan, I. M. Sas – Boca, M. F. Pop, D. A. Iluțiu – Varvara, "A New Technical Version of Wiping of the Steel Wire Surface after "Hot Dip" Zinc Coating". *Procedia Manufacturing*, vol. 22, 2018, pp. 93-98.
6. I.Așchilean, I. Giurca, "Choosing a Water Distribution Pipe Rehabilitation Solution Using the Analytical Network Process Method". *Water*, vol. 10, 2018, pp. 484-490.
7. D. A. Iluțiu – Varvara, C. Aciu, C. M. Mârza, I. M. Sas - Boca, M. Tintelecan, "Assessment of Recycling Potential of the Oily Mill Scale in the Steelmaking Industry". *Procedia Manufacturing*, vol. 22, 2018, pp. 228-232.
8. C. M. Mârza, G. D. Corsiuc, D. A. Iluțiu–Varvara, E. Ceuca, "Case Study Regarding the Conversion Efficiency of Small Horizontal Axis Turbines". *Procedia Engineering*, vol. 181, 2017, pp. 641-648.
9. D. A. Iluțiu–Varvara, C. M. Mârza, F. V. Domnița, I. M. Sas-Boca, M. Tintelecan, "An Assessment of the Metallic Iron Content from Metallurgical Wastes - Essential Factor for Sustainable Development in the Steelmaking Industry". *Procedia Engineering*, vol. 181, 2017, pp. 357-362.
10. D. A. Iluțiu–Varvara, C. Aciu, E. M. Pică, C. Sava, "Research on Chemical Characterization of the Oily Mill Scale for Natural Resources Conservation". *Procedia Engineering*, vol. 181, 2017, pp. 439-443.
11. I.Așchilean, M. Iliescu, N. Ciont, I. Giurca, "The Unfavourable Impact of Street Traffic on Water Distribution Pipelines". *Water*, vol. 10, 2018, pp. 1086-1094.
12. D. A. Iluțiu – Varvara, "Researching the Hazardous Potential of Metallurgical Solid Wastes". *Polish Journal of Environmental Studies (Pol. J. Environ. Stud.)*, vol. 25, no. 1, 2016, pp. 147-152.
13. C. Aciu, C. Roman, D.A. Iluțiu - Varvara, C. Puia, O. Cadar. Plastering Mortar with Antibacterial and Antifungal Properties. *Romanian Journal of Materials*, vol. 46, no.2, 2016, pp. 160 – 166.
14. D. A. Iluțiu–Varvara, C. M. Mârza, C. Aciu, A. Hădărean, F. V. Domnița, I. M. Sas - Boca, A. M. Mihu, "An Assessment of Pollution with Volatile Organic Compounds in the Electric Arc Furnaces". *Procedia Technology*, vol. 22, 2016, pp. 452-456.
15. D. A. Iluțiu–Varvara, C. M. Mârza, I. M. Sas - Boca, V. A. Ceclan, "The Assessment and Reduction of Carbon Oxides Emissions at Electric Arc Furnaces - Essential Factors for Sustainable Development". *Procedia Technology*, vol. 19, 2015, pp. 402-409.
16. D. A. Iluțiu – Varvara, L. Brândușan, G. Arghir, E.M. Pică, "Researches About the Characterization of Metallurgical Slags for Landfilled Wastes Minimization". *Environmental Engineering and Management Journal (EEMJ)*, vol.14, no. 9, 2015, pp. 2115-2126.

Significant solutions:

New technologies for industrial wastes minimization;
 New technologies for hazardous wastes minimization;
 New methods for environmental factors pollution control;
 New technologies for improvement the environment quality;
 New methods for improvement the quality of industrial microclimate.

Products and technologies:

New materials for building services;
 Technologies with low environmental impact.

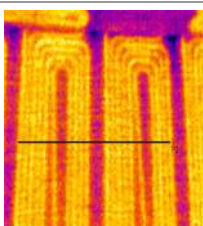
The offer addressed to the economic environment

Research & development	Research and development for industry by using applied research. Research and development of new methods and technologies with low environmental impact. Recovery of industrial wastes / Recycling of industrial wastes. Research and development of new methods and technologies for hazardous wastes treatment. Research and development of new materials for building services. Research and development of advanced materials for building services.
Consulting	Consultancy for the industrial or academic environment, according to the skills of the research group members, in the following domains: Environmental Engineering; Indoor air quality (IAQ); Outdoor air quality (OAQ); Prediction of the environmental quality factors; Advanced materials; Wastes management; Materials with Special Properties; Materials for Building Services.
Training	Training courses according to the skills of the research group members. Training courses in environmental factors pollution control. Training courses in environmental quality analysis. Training courses in industrial wastes and hazardous wastes. Training course in prediction methods for environmental quality factors. Training courses in waste management. Training courses in materials for building services. Training courses in indoor air quality (IAQ). Training courses in outdoor air quality (OAQ). Training courses in quality of industrial microclimate.

WATER & ENERGY SYSTEMS

Contact details

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Director	Assoc.Prof. Dr. Eng. Eugen Vitan
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Sustainability				
Material, Material properties	CO ₂ emission equivalent → (CO ₂ eq.)	Embodied Energy → MJ/kg	LCC* → [Euro/year]	Utilities amount
UM→				
Concrete	0.107	0.75	3.08	0.92
PVC-U	3.23	67.6	4.72	0.35
HDPE	2.52	84.4	5.15	0.26
GRP	8.1	100	3.06	0.42
Vitrified clay	0.55	7.9	2.54	0.96
Shares	0.3	0.3	0.4	

* On 600, road, 2 m deep.

Areas of expertise

Water systems: Surveillance and measurements in water and sewer systems, Material selection methods, Water treatment, Water management

Energy in buildings: Energy performance certificate, Energy management, Thermal imaging, HVAC performance monitoring

Team

Assoc.Prof. Dr. Eng. Eugen Vitan, Assoc.Prof. Dr. Eng. Ciprian Bacoțiu, Assoc.Prof. Dr. Eng. Florin Domnița, Assist.Prof. Dr. Eng. Anca Hoțupan, Assist.Prof. Dr. Eng. Cristina Iacob, Assist.Prof. Dr. Eng. Anagabriela Deac, Assist.Prof. Dr. Eng. Gelu Chisăliță, Assist.Prof. Dr. Eng. Adriana Hădărean, Assist.Prof. Dr. Eng. Roxana Mare, Assist.Prof. Dr. Eng. Marius Fetea, Assist. Dr. Eng. Constantin Cilibiu.
PhD Student: Eng. Radu Mănescu

Representative projects

“Study on the assessment of rainfall products by hydrological and hydrotechnical methods for 450 ha, elaboration of the 3D model and definition of their collection solutions”, contract with industry, 2018.
 “Water balance in county water supply systems, algorithms and applications for a county system”, contract with industry, 2018.
 “Shaping the degradation effects of water quality in distribution systems, associated with the situations of large discontinuities of consumption”, contract with industry, 2016.
 “Design of drinking water and sewage systems, expansions, rehabilitation”, contracts SAMTID, POS, POIM, 2004-2019.
 “Method of choice of materials for urban infrastructure”, Life Cycle Analysis (LCC), SSM Engineering tool (based on Global utility method), contract with industry, 2014.
 “Research and development of a membrane Reactor for the production of pure hydrogen usable in supplying fuel cells”, collaboration with ICSI Râmnicu Vâlcea, 2010.
 “Design and realization of the combustion pile assembly. Experimental determinations in order to establish functional performance. Elaboration of technical documentation to achieve a combination of hydrogen and air-powered combustion cells with a useful electrical power of up to 1kW”, collaboration with ICSI Râmnicu Vâlcea, 2006.
 “Measurements for determining the performance of thermal rehabilitation works of buildings and related installations”, contract with industry, 2011.
 “Methodology for calculating the energy performance of buildings, indicative norm Mc001/2006: Revision methodology; Review/elaboration of comments and examples of application”, collaboration with UTCB, 2017.
 “Good Practice Guide for achieving the optimum cost levels of the minimum energy performance requirements of the various categories of buildings”, collaboration with UTCB, 2018.

Significant results

The most representative publications of the past 5 years:

1. N. Stroia, D. Moga, E. Vitan et al., "Internet based SCADA platform for monitoring strategic hydrotechnical structures", PROCEEDINGS OF 2016 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR), Cluj-Napoca, ROMANIA, May 19-21, 2016. Book Series: IEEE International Conference on Automation Quality and Testing Robotics, pp. 545-549, Published: 2016.
2. F. Domnița, A. Hoțupan, A. Abrudan, P. Kapalo, "Case study regarding energy efficiency of a ventilation system with recuperative heat recovery", Journal of Applied Engineering Sciences, Volume 3(16)/2013, Issue 2, ISSN 2247-3769, pp. 27-32.
3. C. Bacoțiu, E. Vitan, A. Hoțupan, P. Kapalo, "Pipe material selection for urban sewerage systems", No Conference Proceedings of Scientific Papers, CASSOTHERM 2017, Technical University of Košice, Civil Engineering Faculty, Institute of Building and Environmental Engineering, pp. 15-21, ISBN 978-80-553-2894-2.
4. A. Hoțupan, "Alternative methods for dimensioning gravitational sewer pipes", International Scientific Conference CIBv 2017, 3-4 November 2017, Brașov, pp. 391-396.
5. L. Văcariu, O. Creț, A. Hangan, C. Bacoțiu, "Water Parameters Monitoring on a Cyberwater Platform", Proceedings of the 20th International Conference on Control Systems and Computer Science, CSCS20, 2nd International Workshop on Cyberinfrastructures for Natural Resources Management, CyRM-2015, May 27-29, 2015, Bucharest, Romania, pp. 797-802, ISBN: 978-1-4799-1780-8/15, DOI: 10.1109/CSCS.2015.24.
6. M. Muste, C. Bacoțiu, D. Thomas, "Evaluation of the slope-area method for continuous streamflow monitoring", Proceedings of the 38th IAHR World Congress, September 1-6, 2019, Panama City, Panama, pp. 121-130, DOI:10.3850/38WC092019-1860.
7. C. Iacob, A. Deac, T. Chira, A. Bolboacă, "Study on optimizing the operation of a wastewater treatment plant in Romania", International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, 2018, Viena, pp. 477-484.
8. A. Deac, C. Iacob, "Reverse osmosis, the optimum solution for membrane water treatment", International Scientific Conference CIBv 2016, BULLETIN OF THE TRANSILVANIA UNIVERSITY OF BRASOV - SERIES I: ENGINEERING SCIENCES, Brasov 2016, pp. 271-276.
9. C. Iacob, A. Deac, T. Chira, A. Bolboacă, "Study of performance indicators at a waste water treatment plant, in Romania", International Multidisciplinary Scientific GeoConference Surveying Geology and Mining Ecology Management, SGEM, 2018, Albena, pp. 695-702.
10. A. Hoțupan, C. Bacoțiu, "A study for choosing the hydrogen production method in Romania by using multi-criteria decision analysis", International Scientific Conference CIBv 2016, BULLETIN OF THE TRANSILVANIA UNIVERSITY OF BRASOV, VOL. 9 (58) SPECIAL ISSUE No.1, 2016, SERIES I, pp. 297-304, ISSN 2065-2127.

Products and technologies:

1. SSM (Safety and Sustainability Method) - Engineering tool for the selection of pipe material.
2. Equipment for the measurement of the HVAC performance and energy of buildings.
3. Algorithms for analyzing the performance of public water utilities systems.
4. Qualitative test rig for water magnetization devices.
5. Regulation norm Mc001, methodology for calculating the energy performance of buildings.
6. Good Practice Guide for achieving the optimum cost levels of the minimum energy performance requirements of the various categories of buildings

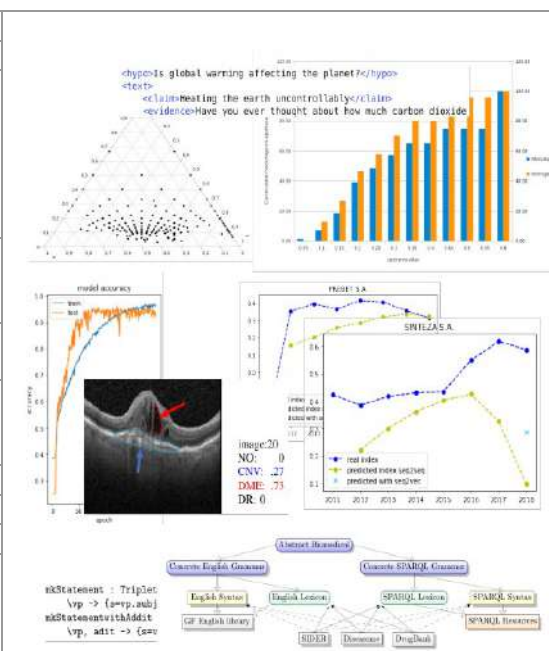
The offer addressed to the economic environment

Research & development	Problems associated with public water utilities systems, diagnostics, performance, quality. Energy performance measurements associated with buildings and the related installations. Decision support algorithms for the choice of materials and technologies.
Consulting	Performance measurements in the field of Building Services Engineering. Analysis of public water utilities systems, diagnostics, performance, quality. Decision support algorithms for the choice of materials and technologies.
Training	Problems associated with building services engineering and public water utilities systems, diagnostics, performance, quality, selection of materials and technologies

INTELLIGENT SYSTEMS GROUP

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Areas of expertise

Machine Learning and Explainable AI - Deep Learning for medical data and autonomous driving.

Knowledge representation and reasoning - Semantic Web; Ontology engineering; Expert systems; Model checking

Natural Language Processing - Machine comprehension, Chatbots, Commonsense reasoning.

Multi-agent systems - Logic-based agents; Agreement technologies; Trust modelling; Ethics for AI, Dialogue protocols

Business processes re-engineering. - Decision support systems; Norm Compliance, E-contracts, Bayesian networks

Team

Prof. Dr. Eng. Ioan Alfred Letia; Assoc. Prof. eng. Emil Chifu, Assoc. Prof. eng. Adrian Groza, Assoc. Prof. eng. Radu Razvan Slavescu, Assoc. Prof. eng. Anca Marginean

Representative projects

“Extensive Capitalization of Experience in Spatial and Security Activities (VESS), project PN-III-P1-1.2-PCCDI-2017-0371 (2018-2020) - member

“Increasing understanding on climate change through public discourse analysis and stakeholders modelling”, EEA Grant Romania-Norway, <http://users.utcluj.ro/~agroza/projects/argclimate/> (2016)

ARGSAFE, **“Using Argumentation for Justifying Safeness in Complex Technical Systems”**, PNII-Capacitati, <http://users.utcluj.ro/~agroza/projects/argsafe/> (2013-2015)

ASDEC, **“Structural Argumentation for Decision Support with Normative Constraints”**, PNII-Capacitati, <http://users.utcluj.ro/~agroza/projects/asdec/> (2013-2014)

LELA, **“Collaborative Recommendation System in the Tourism Domain Using Semantic Web Technologies and Text Analysis in Romanian Language”**, PNII-INOVARE, <http://users.utcluj.ro/~agroza/projects/lela> (2013-2014)

GREEN-VANETS, **“Improving Transportation Using Car-2-X Communication and Multi-Agent Systems”**, Intern project - Technical University of Cluj-Napoca, <http://users.utcluj.ro/~agroza/projects/vanets>

SmartCoDrive – Cooperative Advanced Driving Assistance System Based on Smart Mobile Platforms and Road Side Units”, national research project (2012-2016) - member

ARGNET, **“Structured Argumentation in a Web Context”**, PNII-IDEI 170, <http://users.utcluj.ro/~agroza/argnet.html> (2009-2011)

“Automating Online Dispute Resolution for B2B using multi-agent systems”, CNCSIS-534 <http://users.utcluj.ro/~agroza/odr.html> (2007-2008)

“Collaborative/Competitive Multi-Agent System Oriented on E-Business”, CNCSIS, (2005-2007)

“Software Agents for Processing the Semantic Web”, CNCSIS, (2002-2004)

Significant results

The most representative publications of the past 5 years:

1. A. Groza, P. Ozturk, R.R. Slavescu, A. Marginean. "Climate Change Opinions in Online Debate Sites", In Computer Science and Information Systems, vol. 17 (1), 2020
2. A. Groza. Interleaved Argumentation and Explanation in Dialog in Logic, Cognition, Games, College Pub., 2020
3. A. Marginean, A. Groza, S.D. Nicoara, G. Muntean, R.R. Slavescu, I. A. Letia. "Towards Balancing the Complexity of Convolutional Neural Network with the Role of Optical Coherence Tomography in Retinal Conditions", IEEE 15th International Conference on Intelligent Computer Communication and Processing (ICCP), 2019

4. A. Farcas, A. Marginean. "EmotionSense: Real-time Emotional Feedback from the Audience", IEEE 15th International Conference on Intelligent Computer Communication and Processing (ICCP), 2019
5. R. R. Slavescu, C. Masca and K. C. Slavescu. "Sequence Labeling for Extracting Relevant Pieces of Information from Raw Texts Medicine Descriptions". MEDITECH, Springer, Singapore, pp. 215-219, 2019
6. A. Marginean and G. Pricop. "On the Impact of Semantic Roles on Text Comprehension for Question Answering." In International Conference on Mining Intelligence and Knowledge Exploration, pp. 53-63. Springer, Cham, 2018.
7. A. Onaciu, A. Marginean, "Ensemble of Artificial Neural Networks for Aspect Based Sentiment Analysis", IEEE 14th International Conference on Intelligent Computer Communication and Processing (ICCP), 2018
8. A. Marginean, "Question answering over biomedical linked data with grammatical framework", in *Semantic Web: Interoperability, Usability, Applicability*, vol. 8, no. 4, pp. 565-580, 2017
9. D. Toniuc and A. Groza, "Climebot: an argumentative agent for climate change," in 2017 13th IEEE ICCP International Conference on Intelligent Computer Communication and Processing, (ICCP), 2017, pp. 63-70.
10. Slavescu, R. R.; Oltean, M. N.; Torok, A. P.; et al., Automatic Learning of Medical Text Annotation Rules - a Case Study on Endoscopies 5th International Conference on Advancements of Medicine and Health Care through Technology (MEDITECH), 2016, IFMBE Proceedings Volume: 59 Pages: 248-251 Published: 2017
11. S. Contiu and A. Groza, "Improving remote sensing crop classification by argumentation-based conflict resolution in ensemble learning," *Expert Systems with Applications*, vol. 64, pp. 269-286, Dec 2016.
12. S. A. Gomez, A. Goron, A. Groza, I. A. Letia, "Assuring safety in air traffic control systems with argumentation and model checking", in *Expert Systems with Applications*, vol. 44, pp. 367—38, 2016.
13. I. A. Letia, A. Goron, "Model checking as support for inspecting compliance rules in flexible processes", in *Journal of Visual Languages and Computing*, vol. 28, 2015, pp. 100–121
14. A. Groza, I. A. Letia, A. Goron, S. Zaporojan, "A formal approach for identifying assurance deficits in unmanned aerial vehicle software", in *Advances in Intelligent Systems and Computing Series*, vol. 1089, Springer, 2014
15. P. Donnell, M. Banaji, A. Marginean, C. Pantea, "CoNtRol: an open source framework for the analysis of chemical reaction networks", in *Bioinformatics*, 2014

Significant solutions:

Automatic Diagnosis of retina conditions using deep learning; Analysing arguments on social media; Machine comprehension and natural language processing for chatbots; Recurrent networks for pedestrian identification with pose estimation; Crop classification from satellite images using ensemble learning; Checking compliance of business processes with description logic; Checking compliance against safety standards (e.g. Hazard Analysis at Critical Control Points); Contributions to fundamental research in argumentation and demonstrate innovative technologies validated in real-world scenarios such as safety standards, justifying audit decisions, and structured arguments for medical decision support. Controlled Natural Languages with Grammatical Framework.

Products and technologies:

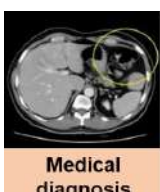
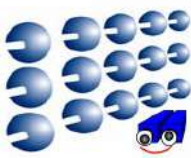
1. Train and visualize deep neural network for OCT B-scans (https://github.com/ancamarginean/retina_amd)
2. Chemical Reaction Network analysis tool (<http://cs-gw.utcluj.ro/~anca/tools.html>) CoNtRol
3. GFMEd (<http://cs-gw.utcluj.ro/~anca/tools.html>)- translating questions about drugs and diseases from English to SPARQL.
4. PEARLS (<http://cs-gw.utcluj.ro/~srazvan/prj/perlas/>) - Personal Expectations Aware Recommender of Landmarks and Sites
5. OntoEG (Ontology-based Essay Grading), 2015 (<http://users.utcluj.ro/~agroza/tools/ontoeg/>) Automated essay grading using ontologies and textual entailment.
6. AHP-OntoEval (AHP Ontology Evaluation), 2014, (<http://users.utcluj.ro/~agroza/tools/ahp>) Ontology evaluation system based on analytic hierarchy process.

The offer addressed to the economic environment

Research & development	Medical data and financial data analysis with machine learning. Natural language processing Norm compliance: verifying business processes against norm compliance and quality standards like HACCP or ISO 22000. Model checking of business processes against ISO-like quality standards. Support for dispute resolution for Small and Medium Enterprises in case of contract breach. Semantic-based business process re-engineering. Decision support systems based on domain-based safety arguments. Logistic planning. Agent oriented technology in support of e-business. Representing and reason on business rules for e-commerce applications. Modelling and simulating trust on the Web. Semantic search of business products. Opinion mining for e-business.
Consulting	Machine learning: design, train and evaluate models Consulting, design, research and prototyping on development of semantic-based intelligent systems. Applied engineering services: engineering safety critical systems, business process re-engineering, model checking verification, ontology engineering.
Training	Machine learning: deep learning, classical machine learning, XAI Semantic Technologies: ontology engineering, reasoning on ontologies, linked data, OWL, RDF Model checking: Computation Tree Logic, Kripke models, hybrid logics. Agent-based programming: Semantic Web services, multi-agent technologies

IMAGE PROCESSING AND PATTERN RECOGNITION RESEARCH CENTER

Contact details

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Acronym	IPPRRC	
Logo		
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Director	Prof. Dr. Eng. Sergiu Nedeveschi	
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Areas of expertise

Image processing and pattern recognition: Colour, grayscale and 3D image processing; Automatic annotation
Stereovision based sensorial perception: Stereovision; Dense optical flow; Object detection, classification and tracking
Object detection, classification and tracking: Use of deep learning and probabilistic model-based techniques for object detection, classification and tracking from grayscale, colour and 3D information
Advanced driving assistance and Autonomous mobile systems: Sensorial perception from cameras, LiDARs, RADARs; Environment representation; Risk assessment, Autonomous vehicles, Autonomous drones
Medical image analysis: Enhancement; Segmentation; Recognition; Structured reporting; Ultrasonography, CT, MRI

Team

Prof. Dr. Eng. Sergiu Nedeveschi, Prof. Dr. Eng. Radu Danescu, Assoc. Prof. Dr. Eng. Tiberiu Marița, Assoc. Prof. Dr. Eng. Florin Oniga, Assoc. Prof. Dr. Eng. Delia Mitrea, Assoc. Prof. Dr. Eng. Mihai Negru, Assist. Prof. Dr. Eng. Cristian Vicas, Assist. Prof. Dr. Eng. Raluca Brehar, Assist. Prof. Dr. Eng. Ion Giosan, Assist. Prof. Dr. Eng. Robert Varga, Assist. Dr. Eng. Razvan Itu, Assist. Eng. Vlad Miclea, Assist. Eng. Andra Petrovai, Assist. Eng. Mircea Muresan, PhD Students: Flaviu Vancea, Horatiu Florea, Bianca Cerasela Zelia Blaga

Representative projects

SEPICA, “Visual Semantics and Integrated Control for Autonomous Systems”, code PN III-P4-ID-PCCF-2016-0180, (2018-2022)
DEEPMSE, “Advanced environmental perception techniques using Deep Learning and probabilistic estimators”, code PN-III-P1-1.1-TE-2016-0440, (2018-2020)
IMPROVE, “High-precision innovative approach regarding robotic assisted intraoperative treatment of hepatic tumors based on integrated imaging-molecular diagnosis”, code PN-III-P1-1.2 PCCDI 2018, (2018-2020)
VLL, “Video based landmarks for localization”, funded by Robert Bosch GmbH, (2017-2018)
MULTISPECT, “Multispectral environment perception by fusion of 2D and 3D sensorial data from the visible and infrared spectrum”, code PN-III-P4-ID-PCE-2016-0727, (2017-2019), <https://cv.utcluj.ro/multispect/>
UP Drive, “Automated Urban Parking and Driving”, H2020 project, <http://up-drive.eu/> (2016-2020)
MULTIFACE, “Multifocal System for Real Time Tracking of Dynamic Facial and Body Features”, PN-II-RU-TE-2014-4-1746 project, (2015-2017). <https://cv.utcluj.ro/multiface/index.php/home.en.html>
R5COP, “Reconfigurable ROS-based Resilient Reasoning Robotic Cooperating Systems”, FP7 ARTEMIS (2014-2017).
RSM, “Road surface measurement and modelling”, funded by Robert Bosch GMBH, (2013-2016)
PAN-ROBOTS, “Plug and Navigate ROBOTS for smart factories”, FP7 project, (2012-2015)
CoMoSeF, “Co-operative Mobility Services of the Future”, Eureka project, (2012-2015)
SMARTCODRIVE, “Cooperative Advanced Driving Assistance System Based on Smart Mobile Platforms and Road Side Units”, PNII PT PCCA (Joint Applied Research Project), <http://cv.utcluj.ro/smartcodrive/> (2012-2016)
AMHEOS, “Automatic Medium and High Earth Orbit Observation System Based on Stereovision”, PNII PCCA (Joint Applied Research Project), <http://cv.utcluj.ro/amheos/> (2012-2016)
MULTISENS, “Multi-scale multi-modal perception of dynamic 3D environments based on the fusion of dense stereo, dense optical flow and visual odometry information”, PNII-Idei, <http://cv.utcluj.ro/multisens/> (2011-2016)

Significant results

The most representative publications of the past 5 years:

1. M.P. Muresan, I. Giosan, S. Nedevschi, "Stabilization and Validation of 3D Object Position Using Multimodal Sensor Fusion and Semantic Segmentation", *Sensors* 20(4):1100, February 2020, DOI: 10.3390/s20041110
2. A. Petrovai, S. Nedevschi, "Multi-Task Network for Panoptic Segmentation in Automated Driving", *Proceeding of 2019 IEEE Intelligent Transportation Systems Conference (ITSC)*, Auckland, New Zealand, 26-30 October, 2019
3. V. Miclea, S. Nedevschi, "Real-Time Semantic Segmentation-Based Stereo Reconstruction", *IEEE Transactions on Intelligent Transportation Systems*, pp. 1-11, June 28, 2019, DOI: 10.1109/TITS.2019.2913883
4. A.D. Costea, A. Petrovai, S. Nedevschi, "Fusion Scheme for Semantic and Instance level Segmentation", *Proceedings of 2018 IEEE Intelligent Transportation Systems Conference (ITSC)*, Maui, Hawaii, USA, November 4-7, 2018, pp. 3469-3475
5. D. Borza, R. Itu, R. Danescu, "In the Eye of the Deceiver: Analysing Eye Movements as a Cue to Deception", *Journal of Imaging*, Vol. 4, No. 10, 2018, Art. No. 120
6. V. Miclea, S. Nedevschi, "Real-Time Semantic Segmentation-Based Depth Upsampling Using Deep Learning", *Proceedings of 2018 IEEE Intelligent Vehicles Symposium (IV)*, Changshu, China, June 26-30, 2018, 2nd best applicative paper
7. M. Drulea, A. Vataavu, S. Mandici, and S. Nedevschi, "An Omnidirectional Stereo System for Logistic Plants. Part 1: Calibration and Multi-Channel Rectification," *Proceedings of the Romanian Academy Series a-Mathematics Physics Technical Sciences Information Science*, vol. 18, no. 1, pp. 89-97, 2017
8. M. Drulea, A. Vataavu, S. Mandici, and S. Nedevschi, "An Omnidirectional Stereo System for Logistic Plants. Part 2: Stereo Reconstruction and Obstacle Detection Using Digital Elevation Maps," *Proceedings of the Romanian Academy Series a-Mathematics Physics Technical Sciences Information Science*, vol. 18, no. 3, pp. 265-272, 2017
9. D. Borza, R. Danescu, R. Itu, A. S. Darabant, "High-Speed Video System for Micro-Expression Detection and Recognition", *Sensors*, Vol. 17, No. 12, 2017, Art. No. 2913
10. R. Varga, A.D. Costea, H. Florea, I. Giosan, S. Nedevschi, "Super-sensor for 360-degree Environment Perception: Point Cloud Segmentation Using Image Features", *Proceedings of 2017 IEEE Intelligent Transportation Systems Conference (ITSC)*, Yokohama, Japan, October 16-19, 2017, pp. 1183-1190, best student paper award
11. A.D. Costea, R. Varga, S. Nedevschi, "Fast Boosting Based Detection Using Scale Invariant Multimodal Multiresolution Filtered Features", *Proceedings of 2017 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017, pp. 993-1002
12. A. Costea, S. Nedevschi, "Semantic Channels for Fast Pedestrian Detection", *Proceedings of 2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Las Vegas, USA, June, 2016, pp. 2360-2368
13. C. Vicas, S. Nedevschi, "Detecting Curvilinear Features Using Structure Tensors", *IEEE Transactions on Image Processing*, vol. 24, no. 11, pp. 3874 – 3887, Nov 2015
14. M. Negru, S. Nedevschi, R. Peter, "Exponential Contrast Restoration in Fog Conditions for Driving Assistance", *IEEE Transactions on Intelligent Transportation Systems*, vol. 16, no. 4, pp. 2257-2268, Aug 2015
15. A. Vataavu, R. Danescu, S. Nedevschi, "Stereo-vision-Based Multiple Object Tracking in Traffic Scenarios Using Free-Form Obstacle Delimiters and Particle Filters", *IEEE Transactions on Intelligent Transportation Systems*, Vol. 16, No. 1, pp. 498-511, Feb 2015

Significant solutions:

High accuracy dense stereovision dense optical flow and ego-motion estimation. Lane detection and tracking. Detection and classification of painted road objects. Obstacle detection, tracking and classification. 3D environment representation. Forward collision detection. Dynamic environment perception. High level reasoning on perception and domain knowledge. Automatic image annotation. Omnidirectional stereovision. Deep learning based perception solutions. Spatio-temporal and appearance based representation of 3D environment, On board perception for autonomous driving.

Products and technologies:

1. Real-time stereovision-based perception solution stance sensorial system for highways
2. Real-time stereovision-based sensorial system for city driving assistance functions
3. Real-time stereovision-based advanced driving assistance for cooperative intersection safety.
4. Real-time GPU based solutions for accurate dense stereovision and accurate dense optical flow estimation.
5. Ground-base long baseline observation system for automatic detection and ranging of Low Earth Orbit objects.
6. Automatic visual annotation system
7. Medical diagnosis assistance system based on ultrasonic image texture analysis, for detection of diffuse diseases, malign and benign liver tumours, prostate cancer
8. Omnidirectional stereovision for surrounding perception used for robotic applications
9. Spatio-temporal and appearance based representation for environment representation
10. Semantic, instance and panoptic segmentation solutions
11. 3D point cloud segmentation

The offer addressed to the economic environment

Research & development	Perception based on 3D depth sensors (LiDARs, RADARs, stereo) and color cameras with applications in robotics, advanced driving assistance and autonomous mobile systems. Medical imaging: textural analysis, probabilistic segmentation and machine learning for assisted diagnosis from ultrasonography and tomography.
Consulting	Consulting towards development of sensory-based perception solutions for autonomous systems.
Training	Image processing, Pattern recognition, Deep Learning, Perception, Autonomous mobile systems

DISTRIBUTED SYSTEMS RESEARCH LABORATORY

Contact details

Name	Distributed Systems Research Laboratory
Acronym	DSRL
Logo	
Site	http://dsrl.coned.utcluj.ro
Address	26-28 G. Baritiu Str., 400027, Cluj-Napoca, Romania
Faculty Department	Faculty of Automation and Computer Science Computer Science Department
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Director	Prof. Dr. Eng. Ioan Salomie
E-mail	Ioan.Salomie@cs.utcluj.ro



Areas of expertise

DSRL has extensive experience in many fields of the distributed systems related research areas such as:

- Energy efficiency in large scale distributed systems
- IoT and Blockchain technology
- Ambient assisted living (AAL)
- Big data analytics and Machine Learning
- Multidisciplinary optimization
- Complex systems modelling, simulation, optimization and adaptation
- Bio-inspired optimization

DSRL carries out research activities within several EU H2020 / PNIII projects and has developed techniques and tools for (i) nonlinear programming optimization of systems energy efficiency, (ii) energy flexibility assessment and budgeting, (iii) Demand Response load profile forecasting and estimation, (iv) load shifting/scheduling for energy consumption reduction, and (v) optimization of IT resources energy consumption. In the modelling and simulation domain DSRL has investigated and developed techniques for modelling of complex systems, machine learning for information extraction and decision making, multi-objective and multi-criteria problems solving using mathematical models and what-if model simulation. In relation with blockchain technology, DSRL has experience in the development of distributed shared ledgers, smart contracts, distributed peer to peer control and distributed consensus which has been successfully applied in domains such as management of smart grids and demand-response programs, ecosystem management and payment of ecosystem services trading, circular economy and smart manufacturing.

Team

Prof. Dr. Eng Ioan Salomie, Assoc. Prof. Dr. Habil. Eng. Tudor Cioara, Assoc. Prof. Dr. Eng. Ionut Anghel, Assoc. Prof. Dr. Eng. Viorica Rozina Chifu, Assist. Prof. Dr. Eng. Cristina Pop, Assist. Prof. Dr. Eng. Marcel Antal, Assist. Prof. Dr. Eng. Claudia Pop, Assist. Eng. Dorin Moldovan, Assist. Eng. Andreea Vesa, Eng. Dan Mitrea, David Sera, Vlad Lazar, Daniel Todea, Ioana Cheres, Vlad Mihailescu, Vlad Blajan.

Representative projects

- **H2HCare** - Social robot-based solution for elders' Care management and coaching after discharge from Hospital to Home, AAL-2019, (2020-2023)
- **ReMember-Me** - Smart assistant to prevent and detect cognitive decline, promote cognitive function and social inclusion among older adults, AAL-2019, (2020-2023)
- **eDREAM** - enabling new Demand REsponse Advanced, Market oriented and Secure technologies, solutions and business models, H2020, (2018 – 2020), <https://edream-h2020.eu/>
- **CATALYST** - Coverting DCs in Energy Flexibility Ecosystems, H2020, (2017-2020), <http://project-catalyst.eu/>
- **ReMind** - Robotic ePartner for Multitarget INnovative activation of people with Dementia, AAL-2017-026, (2018-2021), <https://www.aalremind.eu/>
- **MedGuide** - Integrated System for Coordinated Polypharmacy management in Elders with Dementia, AAL-2016-

- 052, (2017-2019), <http://medguide-aal.eu/>
- **Distributed systems technology and services for electronic registration, transacting and processing of assets**, DSRL-MONTRAN USA, (2016-2019), ID 20143/2016
 - **Eco2Cloud** – Technologies for efficient management and scheduling of cloud resources in cloud for reducing Alps data centre energy consumption, PNCDI III – BG (2016-2018), <http://coned.utcluj.ro/Eco2Cloud/index.html>
 - **OptiPlan** – Technologies for Digitalization, Analysis and Optimization of Manufacturing of Flow Regulators and Monitors at Emerson Factory, PNCDI III – BG (2016-2018), <http://coned.utcluj.ro/OptiPlan/>
 - **GEYSER** - Green nEtworked Data Centres as Energy ProSumErs in smaRt city environments, EU FP7, ICT-2013.6.2: Data Centres in an energy-efficient and Environmentally friendly Internet, <http://www.geyser-project.eu> (2013-2016)
 - **Elders-UP!** - Adaptive system for enabling the elderly collaborative knowledge transference to small companies, EU FP7 – PNCDI/II, Active and Assisted Living Programme AAL-2013-6, <http://www.eldersup-aal.eu> (2014-2016)
 - **DIET4Elders** - Dynamic Nutrition Behaviour Awareness System for the Elders, EU FP7 – PNCDI/II, Active and Assisted Living Programme AAL-2012-5, <http://www.diet4elders.eu/> (2013-2016)
 - **GAMES** - Green Active Management of Energy in IT Service centres, EU FP7, ICT-2009-6.3: ICT for Energy efficiency, <http://www.green-datacenters.eu/> (2010-2012)

Significant results

The most representative publications of the past 5 years:

1. Pop, C.; Antal, M.; Cioara, T.; Anghel, I.; Salomie, I.; Bertoncini, M. A Fog Computing Enabled Virtual Power Plant Model for Delivery of Frequency Restoration Reserve Services. *Sensors* 2019, 19, 4688. IF:3.031 Q1
2. Pop, C.; Antal, M.; Cioara, T.; Anghel, I.; Sera, D.; Salomie, I.; Raveduto, G.; Ziu, D.; Croce, V.; Bertoncini, M. Blockchain-Based Scalable and Tamper-Evident Solution for Registering Energy Data. *Sensors* 2019, 19, 3033. IF:3.031 Q1
3. T. Cioara, I. Anghel, I. Salomie, M. Antal, C. Pop, M. Bertoncini, D. Arnone, F. Pop, Exploiting data centres energy flexibility in smart cities: Business scenarios, *Information Sciences*, 2019, ISSN 0020-0255 IF: 5.524 Q1
4. M. Antal, C. Pop, T. Petrican, A. V. Vesa, T. Cioara, I. Anghel, I. Salomie, E. Niewiadomska-Szynkiewicz, MoSiCS: Modeling, simulation and optimization of complex systems—A case study on energy efficient datacenters, *Simulation Modelling Practice and Theory*, 2019, ISSN 1569-190X IF: 2.426 Q2
5. M. Antal, T. Cioara, I. Anghel, C. Pop and I. Salomie, Transforming Data Centers in Active Thermal Energy Players in Nearby Neighborhoods, *Sustainability* 2018, 10, 939. IF:2.592 Q2
6. C. Pop, T. Cioara, M. Antal, I. Anghel, I. Salomie and M. Bertoncini, Blockchain Based Decentralized Management of Demand Response Programs in Smart Energy Grids, *Sensors* 2018, 18(1), 162. IF:3.031 Q1
7. T. Cioara, I. Anghel, I. Salomie, L. Barakat, S. Miles, D. Reidlinger, A. Taweel, C. Dobre, F. Pop, Expert system for nutrition care process of older adults, *Future Generation Computer Systems*, Volume 80, March 2018, Pages 368-383, ISSN 0167-739X. IF:5.768 Q1
8. T. Cioara, I. Anghel, M. Bertoncini, I. Salomie, D. Arnone, M. Mammina, T. Velivassaki, M. Antal, Optimized Flexibility Management enacting Data Centres Participation in Smart Demand Response Programs, *Future Generation Computer Systems*, Volume 78, Part 1, January 2018, Pages 330-342. IF: 5.768 Q1
9. M. Antal, C. Pop, T. Cioara, I. Anghel, I. Salomie, F. Pop, A system of systems approach for data centers optimization and integration into smart energy grids, *Future Generation Computer Systems*, Available online 24 May 2017, ISSN 0167-739X. IF: 5.768 Q1
10. A. Taweel, L. Barakat, S. Miles, T. Cioara, I. Anghel, A.-R. H. Tawil, Ioan Salomie, A service-based system for malnutrition prevention and self-management, in *Computer Standards & Interfaces*, 2016. IF: 2.441 Q2

Technological services (<http://erris.gov.ro/DSRL>):

1. Energy and blockchain services for smart grid
2. Energy efficiency and multidisciplinary optimization services
3. Green cloud scheduler service
4. Modelling and simulation services
5. Big data analytics platform as a service

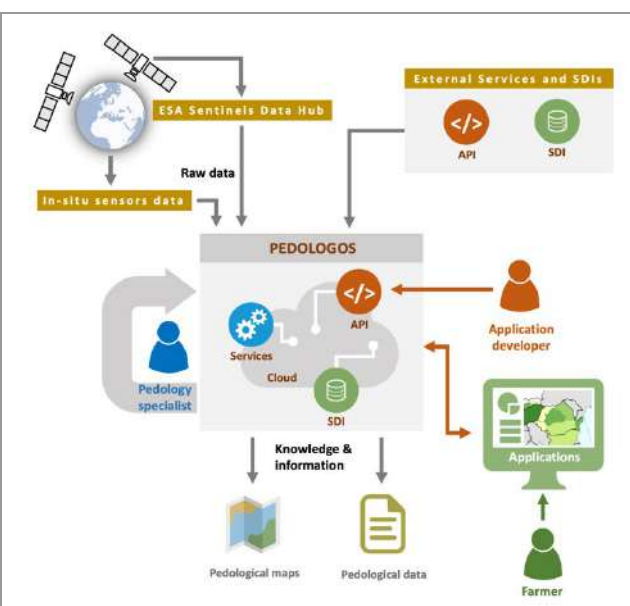
The offer addressed to the economic environment

Research & development	Core research areas: blockchain technologies, energy efficiency, ambient assisted living. Development services in the following domains: ambient assisted living, green computing and systems, intelligent systems, smart factories, bio-inspired distributed computing and systems, service oriented distributed computing and systems, autonomic computing and systems, distributed pervasive systems.
Consulting	Consulting services for development of blockchain-based decentralized systems, ambient assisted living systems, service oriented distributed systems, green systems, intelligent and bio-inspired systems.
Training	Training courses in the following domains: software engineering, information systems integration, web applications development, component-based and service-oriented distributed systems development, programming techniques and programming languages.

COMPUTER GRAPHICS AND INTERACTIVE SYSTEMS LABORATORY

Contact details

Name	Computer Graphics and Interactive Systems Laboratory
Acronym	CGIS
Logo	
Site	http://cgis.utcluj.ro
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Director	Prof. Dr. Eng. Dorian Gorgan
e-mail	dorian.gorgan@cs.utcluj.ro



Areas of expertise

High performance graphical processing and visualization, parallel and distributed processing on cloud infrastructures, interoperability of HPC platforms, interactive application development, software platforms and applications for spatial data processing and visualization, visual analytics, machine learning based satellite data classification, interdisciplinary research in the domains of Earth Sciences and Earth Observations.

Team

Prof.Dr.Eng. Dorian Gorgan, Assoc.Prof.Dr.Eng. Victor Băcu, Assoc.Prof.Dr.Eng. Teodor Ștefănuț, Senior Lect.Dr.Eng. Cornelia Melenti, Senior Lect.Dr.Eng. Mihaela Ordean, Senior Lect.Dr.Eng. Adrian Sabou, Dr.Eng. Cristian Mocan, Assist.Prof.Eng. Constantin Nandra, Drd.Eng. Vlad Colceriu, Drd.Eng. Mihai Bica, Drd.Eng. Denisa Copandean, Drd.Eng. Elena Neacsu, Eng. Razvan Margin

Representative projects

NEARBY – “Visual Analysis of Multidimensional Astrophysics Data for Moving Objects Detection”, STAR 2017, (2017-2019) <http://cgis.utcluj.ro/nearby>
HORUS – “Software Toolbox for Pedological Monitoring of Transylvanian Area based on Sentinel-2 Data”, STAR 2017, (2017-2019) <http://cgis.utcluj.ro/horus/>
BIGEARTH - Flexible processing of big earth data over high performance computing architectures, ROSA STAR project (2013-2016), <http://cgis.utcluj.ro/projects/bigearth>
PECSA - Experimental Computer Services Platform for Scientific and Entrepreneurial Development, PN-II-PT-PCCA project (2014-2017), <http://cgis.utcluj.ro/pecsa>
IASON - Fostering sustainability and uptake of research results through Networking activities in Black Sea & Mediterranean areas, FP7 project, funded by the European Commission (2013 - 2015), <http://www.iason-fp7.eu/>
EnviroGRIDS - Building Capacity for a Black Sea Basin Observation and Assessment System supporting Sustainable Development. FP7 project, funded by the European Commission (2009 - 2013), <http://www.envirogrids.net/>
SEE-GRID-SCI - SEE-GRID infrastructure for regional eScience. FP7 project, funded by the European Commission (2008 - 2010), <http://www.see-grid-sci.eu/>
KEYSTONE - Semantic keyword-based search on structured data sources, COST Action IC1302 (2013-2017), <http://www.keystone-cost.eu/keystone/>
ComplexHPC - Open European Network for High-Performance Computing in Complex Environments, COST Action IC0805 (2009-2013), <http://complexhpc.org/>
mEducator - Multi-type Content Repurposing and Sharing in Medical Education. eContentplus - Digital Content and Cognitive Systems Programme funded by European Commission (2009-2012), <http://www.meducator.net/>
GISHEO – On demand Grid services for high education and training in Earth observation. Funded by European Space Agency through PECS Programme (2008-2010), <http://gisheo.info.uvt.ro/>

Significant results

The most representative 10 publications of the past 5 years:

1. Gorgan D., Vaduvescu O., Stefanut T., Bacu V., Sabou A., Copandean D., Nandra C., Boldea C., Boldea A., Predatu M., Pinter V., Stanica A., “Nearby Platform for Automatic Asteroids Detection and Euronear Surveys”. Proc. 1st NEO

- and Debris Detection Conference, Darmstadt, Germany, 22-24 January 2019, published by the ESA Space Safety Programme Office Ed. T. Flohrer, R. Jehn, F. Schmitz, (2019).
2. Bacu V., Stefanut T., Gorgan D., "Building soil classification maps using HorusApp and Sentinel-2 Products". Proceedings of the 2019 IEEE 15th International Conference on the Intelligent Computer Communication and Processing (ICCP), pp.79-85, (2019).
 3. Nandra C., Gorgan D., "Usability evaluation of a domain-specific language for defining aggregated processing tasks". Proceedings of the 2019 IEEE 15th International Conference on the Intelligent Computer Communication and Processing (ICCP), pp.87-94, (2019).
 4. Gorgan D., Rusu T., Bacu V., Stefanut T., Nandra N., "Soil Classification Techniques in Transylvania Area Based on Satellite Data". *World Soils 2019 Conference*, 2 - 3 July 2019, ESA-ESRIN, Frascati, Italy (2019).
 5. Bica M., Gorgan D., "Data Locality Aware Algorithm for Task Execution on Distributed, Cloud Based Environments". *Advances in Intelligent Systems and Computing book series*, vol. 611, pp.557-566. Springer, Cham, ISBN 978-3-319-61565-3, (2018).
 6. Gorgan D., Stefanut T., Bacu V., Copandean D., Nandra N., Vaduvescu O., "Optical Detection of Asteroids by NEARBY Platform". *Journal of Aeronautics & Aerospace Engineering*, Vol.7, (2018).
 7. Stefanut T., Bacu V., Nandra C., Balazs D., Gorgan D. and Vaduvescu O., "NEARBY Platform: Algorithm for Automated Asteroids Detection in Astronomical Images". Proceedings of the 2018 IEEE 14th International Conference on the Intelligent Computer Communication and Processing (ICCP), pp.365-369, (2018).
 8. Colceriu V.D., Stefanut T., Bacu V., Gorgan D., "Annotation and Position Recall from Low Grade Sensorial Data in the Context of Topological Railway Maps". *Journal of Studies in Informatics and Control, Special Issue on Advanced Services in Heterogeneous Distributed Systems*, Vol.26(4), pp. 469-480, (2017).
 9. Mazzetti P., Roncella R., Mihon D., Bacu V., Lacroix P., Guigoz Y., Ray N., Gregory G., Gorgan D., Nativi S., "Integration of data and computing infrastructures for earth science: an image mosaicking use-case", *Earth Science Informatics*, vol. 9, pp. 325-342, (2016).
 10. Rodila D.D., Ray N., Gorgan D., "Conceptual Model for Environmental Science Applications on Parallel and Distributed Infrastructures", *Journal of Environmental Systems Research*, 4:23, (2015).

Software tools and platforms developed by CGIS Laboratory:

HORUS, HorusApp – platform and application for machine learning based soil classification by using satellite and spatial data processing.

NEARBY – cloud platform for astronomical moving objects detection and tracking.

BIGEARTH – platform to support the flexible description and adaptive processing of massive data over distributed HPC infrastructures.

WorDeL – workflow oriented language for flexible description of parallel and distributed processes.

gSWAT - gSWAT - platform and application allows the user to calibrate and execute the SWAT hydrological models in a flexible and interactive manner by taking advantage of the Grid infrastructure.

gSWATSim – is a collection of Web services supporting the Grid based calibration and execution of the SWAT hydrological models. It provides the SWAT related basic functionality required to develop a remote Web application.

GreenLand – is a platform and application for Grid based satellite image processing and visualization. The processing is described by an interactive graphical editor. The application is connected by standard geospatial services to spatial data repositories.

ESIP – Grid based satellite image processing platform. GreenLand is layered on ESIP and gProcess.

gProcess – Grid oriented task management and execution platform. gProcess is the basic platform for ESIP, GreenLand, and gSWAT.

eGLE – eLearning Platform for Earth Science domain. It supports the development and execution of teaching materials including Grid based processing of satellite images, and connectivity by geospatial Web services.

GreenView – supports the refinement of surface and vegetation parameters in South East Europe region based on satellite images.

eTrace – eLearning platform for developing learning materials by graphical annotations on 3D objects.

MedioGrid – first national Grid infrastructure for research and education (2006).

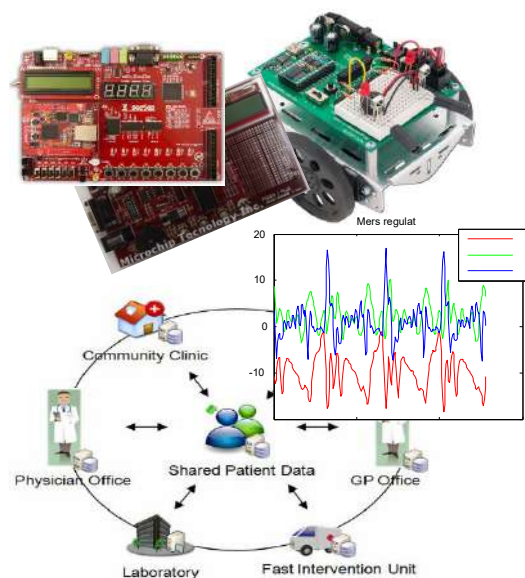
The offer addressed to the economic environment

Research & development in core areas	GPU cluster and Cloud computing High performance processing and visualization Geospatial service oriented architectures
Research & development in applied fields	Development of Earth Science oriented applications Earth Observation big data processing and classification
Consulting	Graphics modelling and simulation User interactive application development methodology High performance computation
Training	User interactive application development methodology Usability evaluation of graphical user interfaces

EMBEDDED AND DEDICATED COMPUTER SYSTEMS LABORATORY

Contact details

Name	Embedded and Dedicated Computer Systems
Acronym	eDCS
Logo	
Site	http://users.utcluj.ro/~sebestyen/eDCS.html http://research.utcluj.ro/tl_files/research/Research%20Domain/Computer%20Science/5_Sebestyen.pdf
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Areas of expertise

Embedded systems, Dedicated digital systems,

Modeling, design and implementation of hardware & software systems adapted for various applications in industrial, medical and security domains.

IoT, IIoT, Industry 4.0, industrial networks, cyber-physical systems

Design of applications in the area of IoT, Industrial IoT and cyber-physical systems

Real-time systems:

Real-time systems modeling and design, scheduling strategies and simulation

eHealth systems:

Design and implementation of distributed medical information systems and remote patient monitoring applications

Real random number generators and Cryptography:

Design and implementation of Real random generators based on the exploitation of physical phenomena known for their intrinsic random nature (eg quantum phenomena).

Team

Prof. Dr. Eng. Gheorghe Sebestyen, Prof. Dr. Eng. Alin Suciu, Assoc. Prof. Dr. Eng. Lucia Vacariu, Assist. Prof. Dr. Eng. Kinga Marton, s.l. Dr. Ciprian Oprisa
PhD students: Eng. Zoltan Czako, Eng. Francisc Muntean, Eng. Simion Tatar

Representative projects

1. Knowledge transfer on Sensor networks and RFID technologies, contract with CIA SA, Cluj, (2018-2019)
2. Anomaly detection in sensor networks, internal grant, 2017-2018
3. CyberWater, "Prototype Cyberinfrastructure-based System for Decision-Making Support in Water Resources Management", PNII PCCA (Joint Applied Research Project), <http://cyberwater.cs.pub.ro/drupal-7.17/> (2012-2015)
4. Jeopard, "Java Environment For Parallel Realtime Development", European FP7 project, http://www.jeopard.org/index.php?option=com_content&view=article&id=53&Itemid=58 (2007-2010)
5. PRO-INOVA, "Educational Program in Innovation Management", POSDRU/21/1.5/G/24239, <http://platinova.utcluj.ro/DetaliuProiect/index.php> (2010-2012)
6. CryptoRand, "A High Performance System for Generation and Testing of Random Number Sequences for Cryptographic Applications", <http://cryptorand.utcluj.ro/> (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. G Kovács, G Sebestyen, A Hangan, "Evaluation metrics for anomaly detection algorithms in time-series", Acta Univ. Sapientiae 11 (2), 113-130, 2019
2. Gheorghe Sebestyen, Anca Hangan, "Anomaly Detection Using System Identification Techniques", ICINCO 2018 - International Conference in Informatics in Control, Automation and Robotics, Porto, Portugal, 2018
3. G. Sebestyén, A. Hangan, G. Kovacs, Z. Czako, "A Platform for Anomaly Detection in Time-Series", SIP'2018, Budapest, 2018
4. 1. K. Marton, L. Pârvu, A. Suci, "The Impact of Post-processing Functions on Random Number Sequences", in Proceedings - 2018 IEEE 17th Roedunet International Conference, DOI: 10.1109/ROEDUNET.2018.8514140, 2018
5. Sebestyen, Gheorghe; Hangan, Anca; Czako, Zoltan; et al., "A Taxonomy and Platform for Anomaly Detection", 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018
6. G. Sebestyen and A. Hangan, "Anomaly detection techniques in cyber-physical systems," Acta Universitatis Sapientiae Informatica, vol. 9, no. 2, pp. 101-118, Dec 2017.
7. K. Marton, A. Zaharia, S. Banescu, and A. Suci, "Randomness Assessment of an Unpredictable Random Number Generator based on Hardware Performance Counters," Romanian Journal of Information Science and Technology, vol. 20, no. 2, pp. 136-160, 2017.
8. H. Sandor and G. Sebestyen-Pal, Optimal Security Design in the Internet of Things (2017 5th International Symposium on Digital Forensic and Security). New York: Ieee, 2017.
9. G. Hajmasan, A. Mondoc, and O. Cret, Dynamic Behavior Evaluation for Malware Detection (2017 5th International Symposium on Digital Forensic and Security). New York: Ieee, 2017.
10. K. Marton, B. Raluca, A. Suci, and Ieee, "Counting Bits in Parallel," in 2017 16th Roedunet Conference: Networking in Education and Research(RoEduNet International Conference, New York: Ieee, 2017.
11. Gheorghe Sebestyen, „Real-time communications, from industrial networks toward IoT (Internet of Things)”, plenary presentation at *ICCC 2015*, Hungary, 2015
12. Gheorghe Sebestyen, Dan Muresan, Anca Hangan, "Road Quality Evaluation with Mobile Devices", *proceedings of ICC 2015*, Hungary 2015
13. Ciprian Oprisa, George Cabau, and Gheorghe Sebestyen Pal. "Semi-automated verdicts assignment for potentially malicious programs", In *IEEE International Conference on Intelligent Computer Communication and Processing (ICCP)*, Cluj-Napoca, Romania, 2015

Tools and platforms developed:

AutomaticAi – Platform for artificial intelligence (AI) processing and anomaly detection – assures automatic selection and tuning of the best AI algorithm for a given classification problem

CARDIONET - Computerized healthcare system designed to provide tracking and management of patients with cardiovascular disease

Platnova - Platform type digital library for the acquisition, storage, processing and retrieval of information contained in patents

RTMultiSim - Integrated simulation and optimization of real-time systems on parallel and distributed structures

CryptoRand - Integrated high performance system for generating and testing sequences of random numbers for cryptographic applications

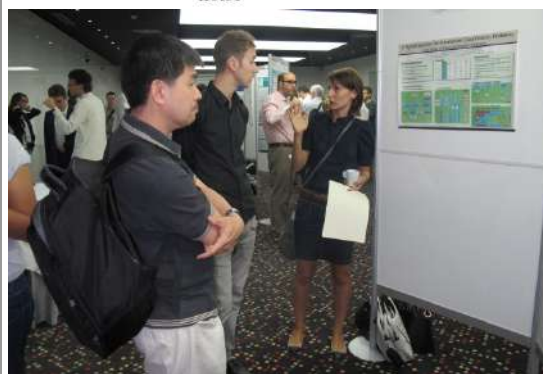
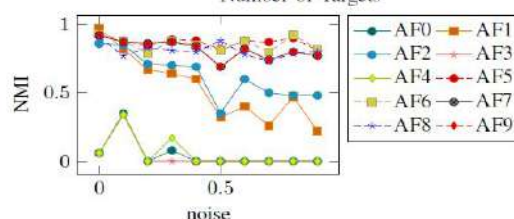
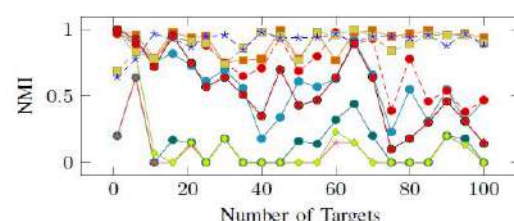
The offer addressed to the economic environment

Research & development	Anomaly detection techniques based on artificial intelligence Security of cyber-physical systems Efficient strategies for scheduling communication and tasks on real-time parallel and distributed architectures; integrated modelling, simulation and optimization of real-time systems. Advanced techniques for generating random numbers with applications in cryptography. Portable medical devices - for continuous monitoring of patients for prophylactic treatment of chronic diseases. Sensor networks for monitoring rivers
Consulting	Cyber-physical Systems, Cyber-Security, IoT, IIoT, Design of dedicated systems based on specialized processors. Development of real-time applications. Cryptography and random number generators Evaluating the quality of a random number generators. Evaluation of algorithms using random number generators Industrial Informatics, industrial networks, According to TRNG design and implementation of user specifications, wireless Sensor Networks
Training	Computer Architecture, Industrial Informatics, Parallel and Distributed Computing, Quality systems, Cryptography.

KNOWLEDGE ENGINEERING GROUP

Contact details

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Areas of expertise

Fundamental theoretical aspects:

Data analytics methods and learning models for natural language understanding, explainable graph analysis, heterogeneous data integration and analysis.

Practical approaches:

Natural language understanding: topic extraction, sentiment analysis, contradiction detection, semantic role labeling, semantic parsing, intent detection and slot filling,

Graph analysis: community detection, functional networks construction from brain signal, functional networks (dynamic) analysis,

Heterogeneous data: (i) IoT: preventive maintenance, failure prediction, user profiling, smart driving (ii) brain signal: artefact detection, burst detection and spike sorting, information coding.

Team

Prof. Dr. Eng. Rodica Potolea, Prof. Dr. Eng. Mihaela Dinsoreanu, Assoc. Prof. Dr. Eng. Camelia Lemnaru.

PhD Students: Cristian Lungu, Octavian Hasna, Florin Macicasan, Vlad Topan, Paul Parau, Timotei Dolean, Lucian Cristea, Ramona Tolas, Raluca Portase, Andrei Mihalca, Dan Toderici, Loredana Dan

Representative projects

"Predictive Maintenance", international project with third parties (Electrolux Italy), 7981/27.03.2019, (2019-2020).

ROBIN - "Robotii si Societatea: Sisteme cognitive pentru Roboti Personali si Vehicule Autonome", PNCDI III, (2018-2020)

"Next generation product service", international project with third parties (company Electrolux Italy), (2014-2017)

SWARA – Sistem mobil de asistare vocala in Reintegrarea Persoanelor cu Afonii Chirurgicale, PCCA-2013-4 No. 6/2014 (2014-2016)

NOKIA, "Context-sensitive recommendation systems", Bilateral grant, (2011-2012)

SEArCH, "Adaptive eLearning Systems using Concept Maps", National research grant funded by CNMP Program 4: Research partnership for priority domains, (2008-2011)

GridMOSI, "Virtual Organization using Grid Technology for High Performance Modeling, Simulation and Optimization", National research grant funded by ANCS, CEEX program, (2005-2008)

ArhiNet, "Integrated System for developing semantically-enhanced archival content", National research grant funded by CNMP Program 4: Research partnership for priority domains, (2007-2010)

FOOD-TRACE, "Integrated IT system for assuring traceability and quality control in food industry", National

research grant funded by ANCS, CEEX program, (2006 - 2008)

IntelPro, "Intelligent system for assisting the therapeutically decision at patients with prostate cancer", National research grant funded by ANCS, CEEX - INFOSOC, (2005-2008)

Significant results

The most representative publications of the past 5 years:

1. Liana-Daniela Palcu, Marius Supuran, Camelia Lemnaru, Mihaela Dinsoreanu, Rodica Potolea and Raul Cristian Muresan, Discovering discriminative nodes for classification with deep graph convolutional methods, in print Lecture Notes in Artificial Intelligence, Springer 2019
2. I. Stan, V. Suci and R. Potolea, "Smart Driving Methodology for Connected Cars," 2019 23rd International Conference on System Theory, Control and Computing (ICSTCC), 2019, pp. 608-613.
3. A. Stoica, T. Kadar, C. Lemnaru, R. Potolea, M. Dinsoreanu: The Impact of Data Challenges on Intent Detection and Slot Filling for the Home Assistant Scenario. ICCP 2019: 41-47
4. Eugen-Richard Ardelean, Alexander Stanciu, Mihaela Dinsoreanu, Rodica Potolea, Camelia Lemnaru, Vasile Vlad Moca: Space Breakdown Method A new approach for density-based clustering. ICCP 2019: 419-425
5. Borsos, Zalan; Lemnaru, Camelia; Potolea, Rodica, Dealing with overlap and imbalance: a new metric and approach PATTERN ANALYSIS AND APPLICATIONS Volume: 21 Issue: 2 Pages: 381-395 Published: MAY 2018
6. Dolean, Samuel; Dinsoreanu, Mihaela; Muresan, Raul Cristian; et al., A Scaled-Correlation Based Approach for Defining and Analyzing Functional Networks, Book Series: Lecture Notes in Artificial Intelligence Volume: 10785 Pages: 80-92 Published: 2018
7. P. Parau, C. Lemnaru, M. Dinsoreanu, and R. Potolea, OPINION LEADER DETECTION (Sentiment Analysis in Social Networks). San Francisco: Morgan Kaufmann Pub Inc, 2017, pp. 157-170.
8. I. Barbantan, M. Porumb, C. Lemnaru, and R. Potolea, "Feature Engineered Relation Extraction - Medical Documents Setting," *International Journal of Web Information Systems*, vol. 12, pp. 336-358, 2016.
9. Hasna Octavian Lucian, Macicasan Florin Cristian, Dinsoreanu Mihaela, Potolea Rodica, "Modeling Sentiment Polarity with Meta-features to Achieve Domain-Independence", *6th (IC3K)*, 2014, Vol. 553, Pp. 212-227,
10. M.Dinsoreanu, R. Potolea, "Towards a Unified Thematic Model for Recommending Context-Sensitive Content", in *Knowledge Discovery, Knowledge Engineering and Knowledge Management, Communications in Computer and Information Science*, vol. 415, 2013, pp. 68-83
11. M.Dinsoreanu, R.Potolea, "A scalable approach for Contradiction Detection driven by Opinion mining", *iiWAS2013*, pp. 7-15

Significant solutions:

End to end explainable graph classification pipeline

A new metric for assessing imbalance and overlap in data

AMR semantic parsing solution

Products and technologies:

1. Specific solutions in the Neuro Science domain (Artefact identification, Burst detection and spike sorting, Functional networks extraction and analysis)
2. Intent detection and slot filling – Eng & Ro languages
3. Topic extraction and representation - identifying the topic polarity in a given document; projecting (very) large (un)structured data to relevant dimensions and providing representation to allow knowledge extraction
4. Community detection- identifying clusters from implicit and/or explicit connections; community detection social data; opinion driven community detection. Contradiction Detection - opinion mining driven contradiction detection
5. User profiling - finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behavior applied to the educational domain
6. Recommendation systems - context sensitive, semantic driven recommendation systems for online advertisement and tourism
7. Medical decision support systems - assisting medical diagnosis in prostate cancer and rheumatoid diseases

The offer addressed to the economic environment

Research & development	Recommendation systems in different areas – developing prototype recommendation systems according to state of the art techniques in the field and up-to-date technologies. User profiling – finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behaviour. Data integration – designing unified data (warehouse) structures to integrate heterogeneous data sources, designing corresponding ETL processes. Decision support systems – extracting knowledge from organizational data, predicting evolutions, trends, identify relationships and correlations. End-to-end data analysis and (deep) machine learning pipelines
Consulting	Consulting, design, research and prototyping ML solutions for multiple industrial and scientific fields.
Training	Data Analysis, Machine Learning, Deep Learning

COMMUNICATIONS NETWORKS AND PROTOCOLS RESEARCH LAB

Contact details

Name	Communications Networks and Protocols Research Lab
Acronym	LabRPC
Logo	
Site	http://cnp.utcluj.ro/ http://research.utcluj.ro/tl_files/research/Research%20Domain/Computer%20Science/Dadarlat_LabRPC.pdf
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Fax	+40-264-591690
Director	Prof. Dr. Eng. Vasile Teodor Dadarlat
e-mail	Vasile.Dadarlat@cs.utcluj.ro



Areas of expertise

Computer and communication networks, Communication protocols

- development of frameworks for efficient data transmissions within hybrid computer networks optimizing the use of available bandwidth; - design and implementation of Quality of Service aware frameworks; - security and virtualization

Wireless Sensor Networks

- development of new methods for routing within sensor networks, efficient use of resources and secure access to WSNs; - development of specific applications (Internet of Things) with WSNs, Sensors-Cloud systems

Grid communications

- grid based applications development (intensive computing, specific management)
- development of smart communication protocols, integration of real-time decision-making algorithms

Software products

- wireless and sensors communications, adaptive routing, secure communications, benchmarking

Team

Prof. Dr. Eng. Vasile Teodor DADARLAT, Assoc. Prof. Dr. Eng. Emil CEBUC, Assoc. Prof. Dr. Eng. Adrian PECULEA, Senior Lecturer Dr Eng. Bogdan IANCU, Eng. Rudolf Kovacs, Eng. Sorin Buzura

Representative projects

Interconectarea rețelelor WSN (Wireless Sensor Network) în agricultura de precizie. Modele hibride de clasificare, recomandare și învățare; Competiția Internă de Granturi de Cercetare, Dezvoltare, Inovare UTCN CICDI 2017-2018, responsabil proiect: S.I. dr. ing. Bogdan IANCU

Brained City: Dezvoltarea Inovativa prin Informatizare a Ecosistemului urban Cluj-Napoca", proiect inovativ al Clusterului ClujIT finantat pe POSCCE/Operatiunea 1.3.3, subproiect **"E-Health WSN Middleware: Middleware pentru adaptarea echipamentelor eterogene medicale si ale pacientilor existente utilizand o infrastructura WSN"** UTCN/AC director: Prof. dr. ing. Vasile-Teodor Dadarlat.

"Analiza si taxonomia solutiilor de compromis intre securitate si calitatea serviciilor pentru comunicatiile IP wireless si mobile", proiect postdoctoral POSDRU/159/1.5/S/137516 perioada: 01.05.2014-31.10.2015, responsabil proiect: S.I. dr. ing. Adrian Peculea

GREEN-VANETS - Improving transportation using Car-2-X communication and multi agent systems, Intern CDI research project at Technical University of Cluj-Napoca, 1 October 2013 - 30 September 2014, member: Senior Lecturer Dr Eng. Bogdan IANCU

QAF - "Quality of Service aware frameworks for networks and middleware", CNCSIS PNII Idei nr. 328, http://www.cs.utcluj.ro/csd/pics/Projects/VDadarlat/en_index.html (2007 – 2010), director project: Prof. dr. ing. Vasile-Teodor Dadarlat

CG-UTCN, Technical University of Cluj-Napoca GRID Center, POS CCE Axa 2; Project 195, Op. 2.2.3, <http://cgutcn.utcluj.ro/index.php> (2009-2011), director proiect: Assoc. Prof. dr. ing. Emil Cebuc

Significant results

The most representative publications of the past 5 years:

1. B. Iancu, I. Illyes, V. Dadarlat, A. Peculea, Pollution Probes Application: the impact of using PVDM messages in VANET infrastructures for environmental monitoring, 2019 IEEE 15th International Conference on Intelligent Computer Communication and Processing, Cluj-Napoca, 2019.
2. R. A. Kovacs, B. Iancu, V. T. Dadarlat, E. Cebuc and S. Buzura, "Extending K-cover genetic algorithm for efficient energy consumption in WSNs," 2019 18th RoEduNet Conference: Networking in Education and Research (RoEduNet), Galati, Romania, 2019, pp. 1-6.doi: 10.1109/ROEDUNET.2019.8909581
3. B. Oniga, S. H. Farr, A. Munteanu and V. Dadarlat, "IoT Infrastructure Secured by TLS Level Authentication and PKI Identity System," 2018 Second World Conference on Smart Trends in Systems, Security and Sustainability (WorldS4), London, 2018, pp. 78-83.
4. A. Bumb, B. Iancu, E. Cebuc, Extending Cooja simulator with real weather and soil data, 17th RoEduNet Conference: Networking in Education and Research Technical University of Cluj-Napoca, September 6, 2018 – September 8, ISSN:2068-1038, pp.40-44,2018, IEEE
5. B. Oniga, V. Dadarlat, E. De Poorter and A. Munteanu, "A secure LoRaWAN sensor network architecture," 2017 IEEE SENSORS, Glasgow, 2017, pp. 1-3.
6. B. Iancu, R. Kovacs, V. Dadarlat, A. Peculea, Interconnecting heterogeneous non-smart medical devices using a wireless sensor networks (WSN) infrastructure, 5th International Conference on Advancements of Medicine and Health Care through Technology - MEDITECH 2016, Oct.2016, Romania
7. Radu, A. Costan, B. Iancu, V. Dadarlat, A. Peculea, Intercloud platform for connecting and managing heterogeneous services with applications for e-health, *RO-LCG Conference*, Cluj-Napoca, Romania, Oct. 2015.
8. Peculea, V. Dadarlat, E. Cebuc, B. Iancu, Test bench for routing optimization algorithms in Proxy Mobile IPv6 environments, *2015 14th RoEduNet International Conference - Networking in Education and Research (NER'2015)*, Craiova, Romania, 24-29 September 2015.
9. Peculea, B. Iancu, V. Dadarlat, E. Cebuc, A. Costan, Framework for testing Proxy Mobile IPv6 functionalities, *Automation, Computers, Applied Mathematics (ACAM) Journal*, Vol. 22:2, ISSN: 1221-437X, pp.243-246, 2015.

Significant solutions:

1. Drafting, development and implementation of a novel end-to-end quality of service sensitive framework for heterogeneous networks with admission control and self-adaptive bandwidth reconfiguration
2. Elaborating and proposing a new method for bandwidth organizing and dynamic allocation of bandwidth between classes in an autonomous system, to assure end-to-end QoS guarantees

Products and technologies:

1. Data Center Room (str. Baritiu 26-28): HVAC system and hosts site grid with 512 core and 12 Terrabytes storage

Patents:

1. B. Iancu, A. Peculea, V. Dadarlat, "QoS sensitive framework for real-time transmission of information in heterogeneous computer networks and dynamic bandwidth allocation method", no. A/10017/2010, 2010
2. A. Peculea, B. Iancu, V. Dadarlat, Cerere de brevet - Metoda de alocare dinamica a latimii de banda si cadru de lucru pentru transmiterea in timp real a informatiilor in retele de calculatoare; Repository No.: A200900659/27.08.2009. Derwent Primary Accession Number: 2011-Q12644

Awards

1. B. Iancu, A. Peculea, V. Dadarlat – Diploma of Honour at the International Exhibition of Research, Innovation and Technological Transfer "Inventica", Iași, 2011
2. B. Iancu, A. Peculea, V. Dadarlat - Excellence Award and Silver Medal at the International Exhibition of Inventions 'ProInvent', Cluj-Napoca, 2011
3. B. Iancu, A. Peculea, V. Dadarlat - Silver Medal at the 3rd European Exhibition of Creativity and Innovation 'Euroinvent', Iași, 2011
4. Peculea, B. Iancu, V. Dadarlat - Excellence Award and Gold Medal at the International Exhibition of Inventions 'ProInvent', Cluj-Napoca, 2010
5. A. Peculea, B. Iancu, V. Dadarlat - Bronze Medal at the International Exhibition of Inventions 'Inventika' București, 2010

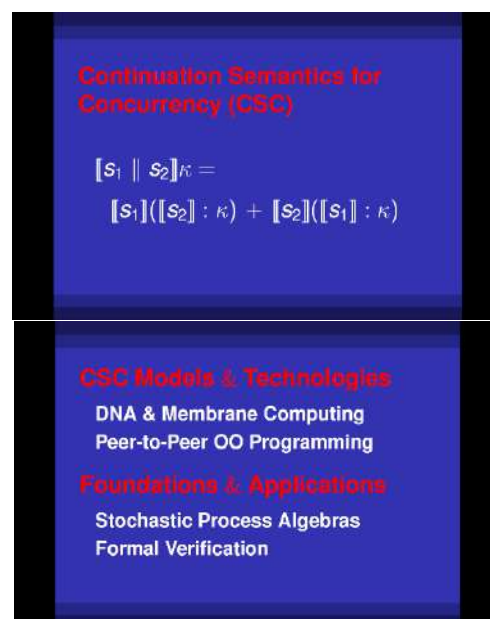
The offer addressed to the economic environment

Research & development	Network administration QoS services implementation Green smart VANETs Wireless and sensors communications in Internet of Things Algorithms for power consumption in WSNs Algorithms for QoS aware routing in hybrid networks Development of applications with high degree of computing requirements
Consulting	Network administration QoS services implementation
Training	CCNA, CCNP, security essentials Advanced issues in computer networks Advanced issues in wireless sensor networks

FOUNDATIONS AND APPLICATIONS OF ADVANCED SOFTWARE TECHNOLOGY - RESEARCH GROUP

Contact details

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Areas of expertise

Software Engineering & Programming Languages:

- Formal Methods, Programming Languages Design and Semantics

Software Solutions for Smart City:

- eBusiness, eAdministration, eHealth, Medical Databases
- Smart Traffic, Urban Traffic Image Processing

Semantic Models and Technologies

- Membrane Computing, DNA Computing
- Global Computing (GC), Image Processing in GC Context

Team

Prof. Dr. Eng. Eneia Nicolae Todoran, Assoc.Prof.Dr. Paulina Mitrea, Eng. Dorin Simina

Representative projects

Next Generation Brained City, “Innovative development through informatization of the Cluj-Napoca urban ecosystem” - POSCCE/Op.1.3.3, no. 13.C01.010, cod SMIS 49752 (2014-2015); sub-projects:

- **ProcessPlayer**, “Platform for the optimization of process flows for and between the public authorities”, collaboration with ARXIA SRL & UBB (Contract POSCCE No.1CLT/800.003/8/29.04.2014 / Subproject SP1)
- “Software services design for intelligent routing in urban road traffic in Smart City context” (Contract POSCCE No.1CLT/800.003/8/29.04.2014 / Subproject SF1)

SemNat, “Semantic models and technologies for natural computing” - CAPABILITIES, Module III, Greece-Romania bilateral collaboration project, no. 582/16.07.2012 (2012-2014)

BETTY, “Behavioral Types for Reliable Large-Scale Software Systems”, ICT COST Action IC1201, http://www.cost.eu/domains_actions/ict/Actions/IC1201 Management Committee members for Romania: Prof.Dr. Gabriel Ciobanu, Prof.Dr. Eneia Nicolae Todoran (2012-2016)

DFA@eInclusion, “Design for All for e-inclusion”, FP7 project no. 033838, (2008-2010)

“Distributed System for Early Prevention, Monitoring and Treatment of the Cardio toxicity Induced by Chemotherapy and Radiotherapy in Oncologic Patients”, PNII/IDEAS Project no. 1340/2009; (2008-2010)

GlobalComp, “Models, semantics, logics and technologies for global computing”, ANCS, CNMP-PC, no. 11052/18.09.2007; (2007-2010).

Significant results

The most representative publications of the past 5 years:

1. G. Ciobanu, E.N. Todoran, "A Semantic Investigation of Spiking Neural P Systems", *Lecture Notes in Computer Science*, vol. 11399, pp. 108-130, Springer, 2019.
2. E.N. Todoran, "Continuation-based Metric Semantics for Concurrency", *Proc. IEEE ICCP 2015*, pp. 551-559, 2019.
3. E.N. Todoran, "Towards Performance Evaluation Programming", *Proc. IEEE SYNASC 2018*, pp. 302-309, 2018.
4. G. Ciobanu, E.N. Todoran, "Denotational semantics of membrane systems by using complete metric spaces", *Theoretical Computer Science*, vol. 701, pp. 85-108, Nov 2017.
5. E.N. Todoran, N. Papaspyrou, "Concurrency Semantics in Continuation-Passing Style", *Fundamenta Informaticae*, vol. 153, no. 1-2, pp. 125-146, 2017.
6. E.N. Todoran, "An Approach to Performance Evaluation Programming", *Proc. IEEE SYNASC 2017*, pp. 320-329, 2017.
7. D. Mitrea, S. Nedeveschi, Paulina Mitrea, et al, *The role of the cooccurrence matrix based on complex extended microstructures in discovering the cirrhosis severity grades within US images* - 10th International Congress on Image and Signal Processing, BioMedical Engineering and Informatics, CISP-BMEI 2017, pp.1-6, Shanghai, China, October 14-16, 2017. IEEE 2017
8. G. Ciobanu, E. N. Todoran, "Correct Metric Semantics for a Language Inspired by DNA Computing", *Concurrency and Computation: Practice and Experience*, vol. 28(11), pp. 3042-3060, Wiley, 2016.
9. G. Ciobanu, E. N. Todoran, "Continuation Passing Semantics for Membrane Systems", *Lecture Notes in Computer Science*, vol. 10105, pp. 165-176, 2016.
10. G. Ciobanu, E.N. Todoran, "Continuation Semantics for Concurrency with Multiple Channels Communication", *Proc. ICFEM 2015, Lecture Notes in Computer Science*, vol. 9407, pp. 400-416, 2015.
11. E.N. Todoran, P. Mitrea, "Semantic investigation of a control-flow subset of BPMN 2.0", *Proc. IEEE ICCP 2015*, pp. 483-490, 2015.
12. I. Chifor, P. Mitrea, et al, "Mathematical methods for assessing the prognostic of fixed partial dentures resulting from evaluating a group of dental patients", *Computational and Mathematical Methods in Medicine*, vol. 2014, article ID 984901, <http://dx.doi.org/10.1155/2014/984901>, 2014.
13. S. Brad, P. Mitrea, "Functional and strategic aligned clusters towards more united economies and sustainable development", *JCI 2015 Proceedings*, ISBN print: 978-3-8487-2429-1, ISBN online: 978-3-8452-6588-9, DOI: [10.5771/9783845265889-126](https://doi.org/10.5771/9783845265889-126)
14. A.I. Mitrea, S. Nedeveschi, D. Mitrea, P. Mitrea, "Diseased tissue area detection and delimitation by fusion between finite difference methods and textural analysis", *Proc. AQTR 2014*, pp. 1-5, 2014.
15. E.N. Todoran, D. Simina, et al, "Mobile Objects and Modern Communication Abstractions: Design Issues and Denotational Semantics", *Proc. IEEE ISPD 2011*, pp. 191-198, 2011.

Significant solutions:

Continuation semantics for concurrency, Denotational semantics for models of natural (membrane, DNA) computing, Denotational semantics for multiparty interaction, Denotational semantics for models of global computing, Performance Evaluation Programming – a programming paradigm supporting performance analysis and formal verification of concurrent systems using dependent types and model checking techniques

Products and technologies:

Prototype interpreter for mobile objects with multiparty interaction in peer to peer systems
 Prototype interpreter for a language supporting performance evaluation programming
 Prototype interpreter for a control flow subset of BPMN 2.0
 Prototypes for medical image processing in global computing context
 Communication prototypes for smart sensor networks

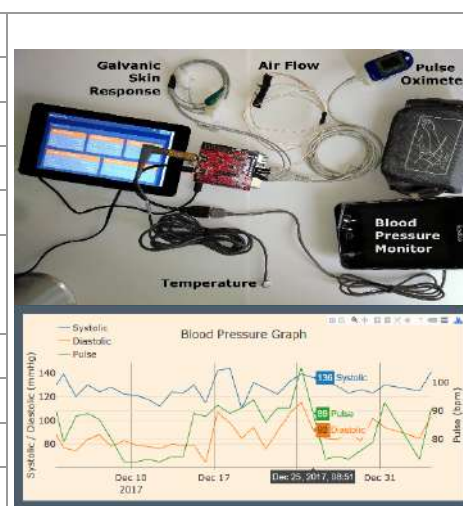
The offer addressed to the economic environment

Research & development	Formal design of reliable distributed software systems and programming languages
Consulting	Formal design of reliable distributed software systems and programming languages
Training	Software Engineering: software development paradigms, UML class diagrams and OO analysis, modeling interaction and behavior, architecting and designing software, software testing techniques and strategies, PRISM probabilistic model checking Advanced Topics in Software Engineering and Programming Languages: formal methods, denotational and operational semantics, stochastic process algebras, type systems

INTELLIGENT EMBEDDED SYSTEMS

Contact details

Name	Intelligent Embedded Systems
Acronym	IES
Logo	
Site	http://ece.ubm.ro/ies/index.php
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e-mail	stefan.oniga@cunbm.utcluj.ro



Areas of expertise

IES laboratory research topics are both fundamental (basic) and applied researches. The main topics for the theoretical research are learning systems, machine learning and for the applied research are wearable computing, mobile robotics, neural networks hardware implementation and ambient intelligent systems development.

Main research topics

- Implementation of Intelligent embedded systems with learning capacity and adaptive behaviour using field programmable gate areas (FPGA)
- Hardware implementation of artificial neural networks in FPGA circuits
- Assistive robots and automated guided vehicles (AGV)
- Activity and health status monitoring platform development
- e-Health and Ambient assisted living systems
- Human computer interfaces
- Intelligent sensors devices, adaptive interfaces with hardware implemented artificial neural networks

Team

Prof. Dr. Eng. Oniga Ștefan, Assist. Prof. Dr. Eng. Buchman Attila, Assist. Prof. Dr. Orha Ioan, Assist. Prof. Dr. Lung Claudiu, Assist. Prof. Dr. Sabou Sebastian, PhD. Students: Alexan Anca, Alexan Alexandru, Pap Iuliu, Vancea Alexandru, Pop Adrian.

Representative projects

Human Activity Recognition (HAR) and Physiological Parameters Monitoring Systems, 2018-2020
 Theoretical and experimental contributions in the field of orientation and navigation of intelligent systems, 2017
 Solutions regarding Intelligent Embedded Systems for Active and Assisted Living, 2016
 Electromagnetic field simulation of capacitive touch sensors, 2015
 Human activity recognition and physiological parameters monitoring systems, 2015
 Intelligent embedded systems with learning capability and adaptive behaviour, 2013
 "Research regarding the implementation of a neural network used to process signals generated by the muscular and nervous system." CNCSIS Contract No. 171/02.10.2007, TD-11.
 Electronic Nose, "Contributions regarding the study, the synthesis and the implementation of certain applications using systems with intelligent sensors" CNCSIS Contract No. 602/2007, code TD-277.
 Sensorial system for hand gesture recognition using artificial neural networks, 2002-2005

Significant results

The most representative publications of the past 5 years

1. J Suto, S Oniga, Efficiency Investigation from Shallow to Deep Neural Network Techniques in Human Activity Recognition, Cognitive Systems Research, Volume 54, May 2019, Pages 37-49, (IF: 1.425)
2. Suto, Jozsef; Oniga, Ștefan, Efficiency investigation of artificial neural networks in human activity recognition JOURNAL OF AMBIENT INTELLIGENCE AND HUMANIZED COMPUTING Volume: 9 Issue: 4 Special Issue: SI Pages: 1049-1060 Published: AUG 2018, (IF: 1.423)
3. J. Suto, S. Oniga, C. Lung, I. Orha, Comparison of offline and real-time human activity recognition results using machine learning techniques, Neural Computing and Applications, March 2018 (IF: 4.213)
4. Alexan, Alexandru; Alexan, Anca; Oniga, Ștefan; et al., Assisted living personal tracker framework

- 2018 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR)
Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
5. Suto, Jozsef; Oniga, Stefan, Music Stimuli Recognition in Electroencephalogram Signal
ELEKTRONIKA IR ELEKTROTECHNIKA Volume: 24 Issue: 4 Published: 2018
 6. Pap, Iuliu Alexandru; Oniga, Stefan; Orha, Ioan; et al., IoT-Based eHealth Data Acquisition System
2018 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR)
Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
 7. Suto, Jozsef; Oniga, Stefan; Sitar, Petrica Pop, Music Stimuli Recognition from Electroencephalogram Signal with
Machine Learning Conference: 7th International Conference on Computers Communications and Control (ICCCC)
Location: Oradea, ROMANIA Date: MAY 08-12, 2018, Pages: 260-264 Published: 2018
 8. Suto, J.; Oniga, S.; Sitar, P. Pop, Feature Analysis to Human Activity Recognition
INTERNATIONAL JOURNAL OF COMPUTERS COMMUNICATIONS & CONTROL Volume: 12 Issue: 1 Pages:
116-130 Published: FEB 2017
 9. Suto, Jozsef; Oniga, Stefan; Sitar, Petrica Pop, Comparison of Wrapper and Filter Feature Selection Algorithms on
Human Activity Recognition Conference: 6th International Conference on Computers Communications and Control
(ICCCC) Location: Oradea, ROMANIA Date: MAY 10-14, 2016 Pages: 124-129 Published: 2016
 10. S. Oniga and J. Suto, "Activity Recognition in Adaptive Assistive Systems Using Artificial Neural Networks,"
Elektronika Ir Elektrotechnika, vol. 22, pp. 68-72, 2016.
 11. Oniga Stefan, Jozsef Suto, "Optimal Recognition Method of Human Activities Using Artificial Neural Networks"
MEASUREMENT SCIENCE REVIEW, Vol. 15, Issue 6, Pp.323-327, Published: DEC 2015
 12. Orha, I.; Oniga, S., Activity Recognition using an e-Textile Data Acquisition System
Conference: 21st IEEE International Symposium for Design and Technology in Electronic Packaging (SIITME)
Location: Brasov, ROMANIA Date: OCT 22-25, 2015
Book Series: International Symposium for Design and Technology in Electronic Packaging Pages: 335-339
Published: 2015
 13. Sabou Sebastian, Oniga Stefan, Lung Claudiu, "Magnetic sensors in inertial navigation system", *20th IEEE
International Symposium on Design and Technology in Electronic Packaging (SIITME)*, Bucharest, ROMANIA, Oct
23-26, 2014, Pp. 211-214, Published: 2014
 14. Oniga, Stefan; Pop-Sitar, Petrica, Application Possibilities of Hardware Implemented Hybrid Neural Networks to
Support Independent Life of Elderly People, Conference: 8th International Conference on Hybrid Artificial Intelligent
Systems (HAIS) Location: Salamanca, SPAIN Date: SEP 11-13, 2013, HYBRID ARTIFICIAL INTELLIGENT
SYSTEMS Book Series: Lecture Notes in Computer Science Volume: 8073 Pages: 520-529 Published: 2013
 15. Orha I., Oniga S., "Study regarding the optimal sensors placement on the body for human activity recognition", *20th
IEEE International Symposium on Design and Technology in Electronic Packaging (SIITME)*, Bucharest, ROMANIA,
OCT 23-26, 2014, Pp. 203-206, Published: 2014
 16. Orha, I.; Oniga, S., Automated system for evaluating health status
Conference: IEEE 19th International Symposium for Design and Technology in Electronic Packaging (SIITME)
Location: Galati, ROMANIA Date: OCT 24-27, 2013 Book Series: International Symposium for Design and
Technology in Electronic Packaging Pages: 219-222 Published: 2013

Oniga Stefan – AGEPI Medal - International Fair of Inventions and Practical Ideas "INVEST-INVENT SIR 21" – Gesture recognition system.

Oniga Stefan, Pap Iuliu, Diploma of excellence of the Society of Inventors from Romania, for: "E-Health platform for measurement and monitoring physiological parameters" at the Maramures Inventors Salon, 2019.

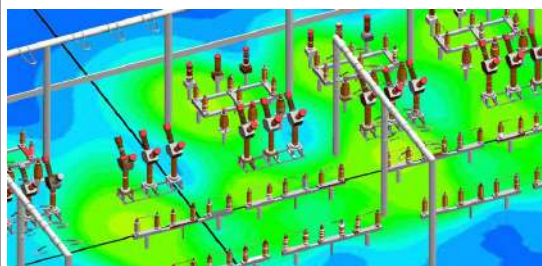
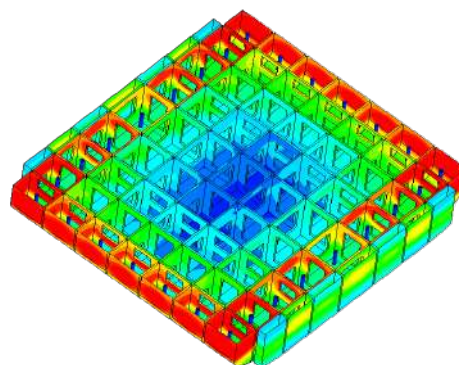
The offer addressed to the economic environment

Research & development	Hardware implementation of artificial neural networks in FPGA circuits. Development of neural network's specific blocks for rapid prototyping of application specific neural networks Intelligent sensors network Adaptive interfaces with learning capabilities able to adapt to the input signals changes Development of an intelligent platform (with learning capabilities and adaptive behaviour) for health condition monitoring of elderly or persons with disabilities, using wearable wireless sensor Mobile applications
Consulting	Embedded systems with microcontrollers and PLDs Data acquisition systems
Training	Design with microcontrollers Design with FPGA circuits

NUMERICAL MODELLING AND ELECTROMAGNETIC COMPATIBILITY RESEARCH LABORATORY

Contact details

Name	Numerical Modelling and Electromagnetic Compatibility Research Laboratory
Acronym	NUMELEC
Logo	
Site	http://ethm.utcluj.ro/numelec
Address	26-28 G. Baritiu str., Room 16A & Calea Dorobantilor str. Building C, Cluj-Napoca, Romania
Faculty Department	Faculty of Electrical Engineering Electrotechnics and Measurements Department
Telephone	+40 264 401244 / +40 722 560560
Fax	+40 264 592903
Director	Prof. Dr. Eng. Calin Munteanu
e-mail	Calin.Munteanu@ethm.utcluj.ro



Areas of expertise

Numerical modelling and optimal design of electromagnetic devices.

Numerical modelling of the electromagnetic field behaviour in complex systems. Time-varying electromagnetic fields. High-frequency electromagnetic fields analysis and waves propagation. Optimal design of the electromagnetic devices and systems. Optimization algorithms in electro magnetics. Evolutionary algorithms for the optimization of the electromagnetic devices

Electromagnetic compatibility

Pre-compliance and compliance tests for conducted and radiated disturbances (emissions and susceptibility) according to the IEC 61000 standards. Analysis of the electromagnetic interferences generated by HV lines on neighbourhood metallic structures. Computation and measurements of the electric and magnetic field values in vicinity of power lines and high voltage substations for compliance with the EMC EU Directive.

Electrochemical systems and cathodic protection

Manufacturing techniques using the electrochemical process; Software for simulation of the electrochemical processes; Mitigation of the electromagnetic interference effects of HVAC and HV power transmission lines on pipeline networks; Optimal design of the cathodic protection systems.

Team

Prof. Calin MUNTEANU, Prof. Vasile TOPA, Assoc. Prof. Marius PURCAR, Assoc. Prof. Laura GRINDEI, Assoc. Prof. Adina GIURGIUMAN (RACASAN), Assoc. Prof. Claudia PACURAR (RACASAN), Lecturer Claudia CONSTANTINESCU (HEBEDEAN), PhD stud. Sergiu ANDREICA, PhD stud. Marian GLIGA, PhD stud. Adrian BOJITA

Representative projects

iDev40 - „Integrated Development 4.0”, ECSEL Call H2020-ECSEL-2017-1-IA-TWO STAGE 6/1.1.3.H/26.11.2019.

Trade-IT - ”Innovative Technologies for Advanced Materials Recovery from IT and Telecommunication Waste”, PN-III-P1-1.2-PCCDI2017-0652, 2017.

Set4CIP - „Multiscale Multigrid Simulator of Electro-Thermo-Mechanical Processes from Power Integrated Circuits”, - PN-III-P2-2.1-BG-2016-0388, 2016.

CEMIVA - “Coupled analysis electromagnetic interference / vibration for the development of electric actuators dedicated to automotive applications with low emissions”, PN II – PT – PCCA – 2013 – 4 – 1019, 2014.

“Measurements of electric and magnetic field in 220 / 110 kV Turnu Severin Est substation”, Research contract with industrial partner ENERGOBIT SA, no. 36526/2019.

“Computing services, analysis, numerical modeling and experimental measurements of electromagnetic field values in locations proposed by the beneficiary” Research contract with industrial partner CEPROM SA, no. 52/2018.

“Measurements of electric and magnetic field in 220 / 110 kV Campia Turzii substation”, Research contract with industrial partner ENERGOBIT SA, no. 55/2017.

Significant results

The most representative publications of the past 5 years:

1. Bojita A., Purcar M., Boianceanu C., Topa V., "Efficient Computational Model Mesh of Thermo-Mechanical Phenomena in the Metal System of Power ICs", 25th THERMINIC International Workshop, LECCO, Italy, 2019.
2. Florea C.I., Bostan C., Simon D., Topa V., Purcar M., "Extraction of Equivalent Mechanical Properties for Power ICs Metallization", 25th THERMINIC International Workshop, LECCO, Italy, 2019.
3. Constantinescu C., Munteanu C., Pacurar C., Racasan A., Gliga M., Andreica S., "High Frequency Analysis of Bowtie Antennas", 11th International Symposium on Advanced Topics in Electrical Engineering, ATEE 2019, Bucharest, Romania, DOI 10.1109/ATEE.2019.8724972, WOS: 000475904500129, 2019.
4. Pacurar C., Topa V., Giurgiuman A., Munteanu C., Constantinescu C., Andreica S., Gliga M., "Modelling and Analysis of the Halbach Array Magnets", 11th International Symposium on Advanced Topics in Electrical Engineering, ATEE 2019, Bucharest, Romania, DOI 10.1109/ATEE.2019.8724977, WOS:000475904500134, 2019.
5. Bojita A., Purcar M., Boianceanu C., Florea C., Simon D., & Topa V. "A Simple Metal-Semiconductor Substructure Model for the Thermal Induced Fatigue Simulation in Power Integrated Circuits", *Lecture Notes in Mechanical Engineering*, DOI:10.1007/978-981-13-2273-0_3, 2019.
6. Constantinescu C., Munteanu C., Păcurar C., Răcășan A., "Influence of the Patch Antenna Feeding on their Parameters", Proc. of the 2018 International Conference and Exposition on Electrical and Power Engineering, EPE 2018, pp. 235-240, Iasi, Romania, ISBN: 978-1-5386-5062-2, ISSN: 2471-6855, WOS: 000458752200044, 2018
7. Bojita A., Boianceanu C., Purcar M., Florea C., Simon D. and Pleșa C., "A simple metal-semiconductor substructure for the advanced thermo-mechanical numerical modeling of the power integrated circuits", *Journal of Microelectronics Reliability*, Elsevier, Volume 87, pages 142-150, August 2018, <https://doi.org/10.1016/j.microrel.2018.06.013>.
8. Constantinescu C., Munteanu C., Pacurar C. et al., "Influence of the Patch Antenna Feeding on their Parameters", International Conference and Exposition on Electrical and Power Engineering (EPE) Book Series: International Conference and Exposition on Electrical and Power Engineering Pages: 235-240, 2018.
9. Gliga M., Racasan A., Munteanu C. "The Influence of Ferrite on the Spiral Inductors Inductance used for the Design of Wireless Power Systems", 7th International Conference On Modern Power Systems (MPS), 2017.
10. Racasan A., Munteanu C., Topa V. et al., "Analysis and Improvement Techniques for the Transfer Function of a Planar Low - Pass Filter", *Environmental Engineering and Management Journal*, Vol. 15, Issue 12, Pp. 2579-2586, 2016.
11. Paljanos A., Miclaus S., Munteanu C., "Occupational Exposure of Personnel Operating Military Radio Equipment: Measurements and Simulation", *Electromagnetic Biology and Medicine*, Vol.34, Issue 3, Pp.221-227, 2015.
12. Hebedean C., Munteanu C., Racasan A., et al., "The Influence of Parameters on the Parasitic Capacitance Values in a Planar Transformer", 9th International Symposium on Advanced Topics in Electrical Engineering (ATEE), Bucharest, Romania Pp. 838-843, 2015.

Significant solutions:

3D mathematical model of Laplace equation with nonlinear boundary conditions for electrochemical applications using the boundary element method (BEM) and finite element method (FEM); Mathematical and numerical model based on "Level Set Method" for shape optimization; Mathematical and numerical model based on "Level Set Method" and Nodal displacement method (NDM) for moving boundary simulation in electrochemical applications of electro-corrosion and electrodeposition.

Products and technologies:

Software package for the full 3D numerical analysis of the electromagnetic interferences between HV lines and pipelines and the optimal design of the cathodic protection systems arrangement; Software package for the numerical computation of the electric and magnetic field values in the vicinity of power lines and inside substations and the optimal design of conductor arrangements for the field mitigation.

International Patents:

Van Den Bossche B. J. W.; Purcar M. I., International Patent Number: WO2008010090-A2; NL1032174-C2; WO2008010090-A3; EP2044242-A2; S2009288954-A1

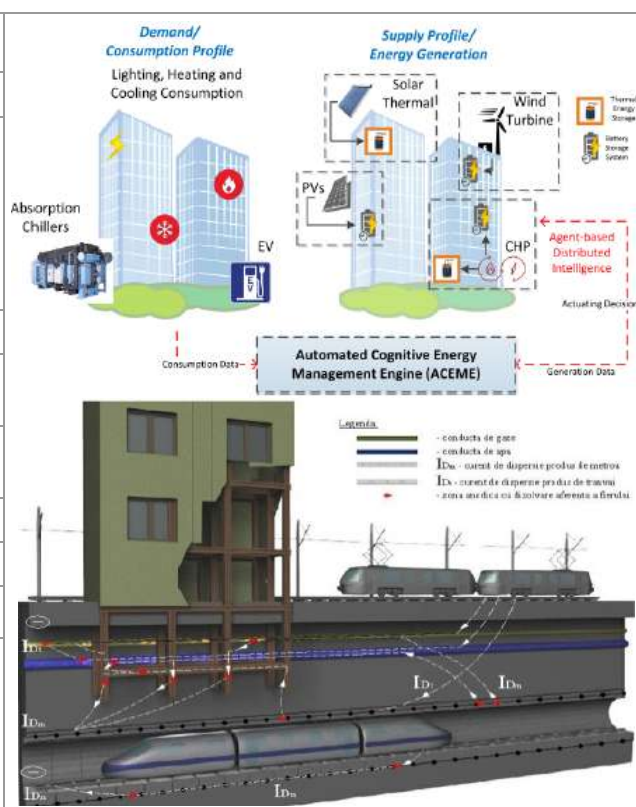
The offer addressed to the economic environment

Research & development	Numerical methods applied in the modelling of the electric and electrochemical process; Optimal design of the electromagnetic devices; CAD in electrical engineering; EMC in electrical and electronics engineering Analysis and optimal design of complex electromagnetic device structures; EMC analysis and mitigation solutions by measurements and numerical modelling;
Consulting	EMC tests according to IEEE 61000 standards series for compliance with the EMC Directive and CE marking; Compliance with 2004/40/EC Directive regarding the human exposure to electromagnetic fields; Manufacturing techniques using the electrochemical process; Mitigation of the inductive and resistive effects of HVAC and HV power transmission lines on pipeline networks; Investigation of fault conditions: 1-phase and 3-phase short circuits discharge current to soil that can lead to coating stress and bridge potentials pipe-soil.
Training	Training and postgraduate education in modelling and simulation of electromagnetic and electrochemical problems and process based on the specific software in the research center. EMC solutions in order to avoid compliance tests failure.

NUMERICAL METHODS RESEARCH LABORATORY

Contact details

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Acronym	NMRL (LCMN)
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Director	Prof. dr. eng. math. Dan Doru MICU
Email	lcmn@et.utcluj.ro Dan.Micu@ethm.utcluj.ro



Areas of expertise

Energy Engineering; Energy Efficiency in Buildings & Industry; Energy analytics numerical tools; Energy Forecasting; Cognitive and artificial intelligence energy management techniques; Energy islands – energy cooperation; Sustainability and Climate Changes; Electromagnetic field numerical analysis; Electromagnetic interferences

Team

Prof. Dan Doru Micu, Dr. Laura Darabant, Dr. Denisa Stet, Dr. Andrei Ceclan, Dr. Levente Czumbil, Dr. Mihaela Cretu, Dr. Silviu Stefanescu, Dr. Cosmin Darab, Dr. Aurel Botezan, Dr. Stefan Cirstea, Dr. Adrian Holhos, Dr. Razvan Radu, Eng. Alexandru Muresan, Eng. Dacian Jurj, Eng. Bogdan Bargauan, Eng. Timea Farkas, Stud. George Berciu

Representative projects

RE-COGnition – "Renewable Cogeneration and Storage Technologies Integration for Energy Autonomous Buildings", Horizon 2020 (2019-2021) <https://re-cognition-project.eu/>
SMEmpower - "A holistic framework for Empowering SME's capacity to increase their energy efficiency", Horizon 2020 (2019-2021) <https://smempower.com/>
DR-BoB - "Demand Response in Blocks of Buildings", Horizon 2020 (2016-2019) www.dr-bob.eu
GEAR-at-SME-"Generate Energy Efficient Acting and Results at Small & Medium Enterprises", Horizon2020 (2020-2022)
MEnS - "Meeting the Energy Professionals Skills", Horizon 2020 (2015-2017) www.mens-nzeb.eu
EmPower Efficiency - "Enhancing the Transfer of Research and Development Methods in Energy-related Clusters from Norway to Romania" - EEA (2017-2018) <http://creesc.ro/en/proiecte/enhancing-rd-methods-energy-related-clusters/>

Significant results

The most representative publications of the past 5 years:

1. A.M. Măgurean, L. Czumbil, D.L. Manea, Dan D. Micu: „Artificial Intelligence based Prediction Model for the Long-Term Heat Flux Losses through Ground Applied to Large Non-Residential Buildings”, *Procedia Manufacturing*, vol. 32, pp. 434-441, 2019

2. **M. Crețu, L. Czumbil, B. Bărgăuan, D. Stet, A. Ceclan, A. Polycarpou, R. Rizzo, Dan D. Micu:** „Modeling and Forecasting Energy Demand in TUCN Buildings”, *International Conference on Clean Electrical Power*, Otranto, Italy, July 2-4, **2019**.
3. Y. Zhu, V. A. Rakov, M. D. Tran, W. Lyu, **Dan D. Micu:** „A Modeling Study of Narrow Electric Field Signatures Produced by Lightning Strikes to Tall Towers”, *Journal of Geophysical Research: Atmospheres*, vol.123/18, pp. 260-277, **2018**.
4. M. Ruba, F. Jurca, **L. Czumbil, Dan D. Micu, C. Marțiș, A. Polycarpou, R. Rizzo:** „Synchronous Reluctance Machine Geometry Optimisation through a GA based Technique”, *IET Electric Power Applications*, vol. 12/3, pp. 431-438, **2018**.
5. **B. Bargauan, M. Cretu, A. Ceclan, L. Darabant, Dan D. Micu, D. Stet, L. Czumbil:** „Energy Management System for the Demand Response in TUCN Buildings”, *53rd Int. Power Engineering Conference*, Glasgow, UK, Sep. 4-7, **2018**.
6. **L. Darabant, L. Czumbil:** „Modeling the symmetrization of single phase receivers using OrCAD”, *10th International Conference and Exposition on Electrical and Power Engineering*, Iasi, Romania, October 18-19, **2018**.
7. **A. Ceclan, Dan D. Micu, D. Stet, L. Czumbil, P. Muresan, B. Bargauan:** „Urban Energy Management - Cluj-Napoca Approach”, *7th International Conference on Modern Power Systems*, Cluj-Napoca, Romania, June 6-9, **2017**.
8. **C. Darab, A. Turcu, S. Stefanescu, A. Botezan, C. Pica:** „Robust Control of MPPT of a PV Cell”, *International Conference on Electromechanical and Power Systems*, Chisinau, Rep. Moldova, October 11-13, **2017**.
9. G. Peppas, T. Tsovilis, E. Pyrgioti, **Dan D. Micu, I. Gonos,** „Lightning Protection of Pipeline Systems”, *International Conference on Lightning Protection*, Lisbon. Portugal, 25-28 Sept. 2016.
10. **Dan D. Micu, S. Braicu, L. Czumbil, D. Stet:** „Load Flow and Short-Circuit Analysis in a Romanian Retrofitted Substation”, *51st International Universities Power Engineering Conference*, Coimbra, Portugal, Sep. 06-09, **2016**.
11. M. Nassereddine, A. Hellany, **Dan D. Micu:** „Utilities Investments into Residential Properties: PV Solar System with Energy Storage”, *51st International Universities Power Engineering Conference*, Coimbra, Portugal, Sep. 06-09, **2016**.
12. **L. Czumbil, Dan D. Micu, C. Munteanu, D. Stet:** „Optimal Design of the Pipeline Right-of-Way Nearby High Voltage Transmission Lines using Genetic Algorithms”, *50th International Universities Power Engineering Conference*, Stoke on Trent, UK, Sep. 01-04, **2015**.

Remarkable results achieved in the projects in the last 5 years – products/technologies adopted by companies

Energy Management advanced tools for local communities, energy cooperatives and energy islands; Optimal energy efficiency solutions for buildings and industry; Power flow and grid reconfiguration numerical analysis; Evaluation, Analysis and Forecasting of power losses in power systems; Development of a hybrid method for computing the effect of inductive, capacitive, conductive couplings on metallic gas pipelines; Development of artificial intelligence techniques to compute the induced voltages and currents in the metallic gas pipelines; Transient overvoltage analysis in GIS substations; Ground resistances testing for industrial structures and substations; Localization of the underground cable paths and cable faults.

Awards:

1. **Best European Energy Service Project**, awarded by *EU Commission, Brussels, 2019*.
<https://www.buildup.eu/en/news/european-energy-service-award-ceremony-com-investment-forum-winners-are>
2. **Eastern & Central Europe Region Institutional Energy Management Award**, awarded by *Association of Energy Engineers, New York, USA, 2018*. <https://www.aeecenter.org/recognizing-individuals-and-organizations-contributions-energy-industry-ae-regional-awards-ceremony>
3. **Romanian Energy Award – Special Jury Award**, awarded by *Energynomics, Bucharest, 2015*.
<https://instalnews.ro/evenimente/castigatorii-galei-premiilor-de-excelenta-in-energie-romanian-energy-awards-2015>

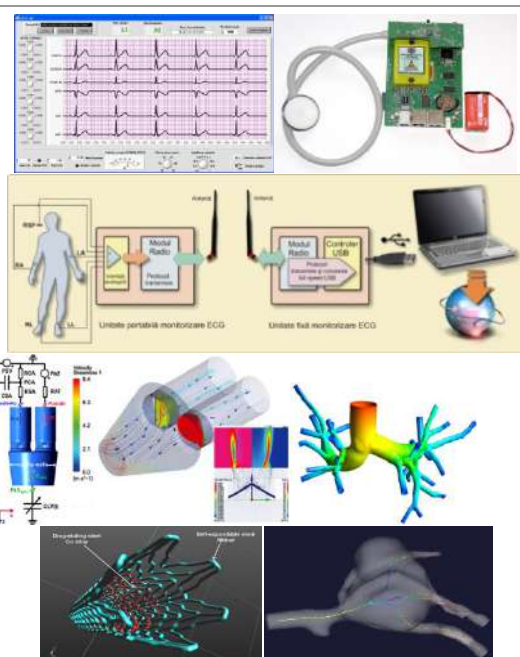
The offer addressed to the economic environment

Research & development	Energy Sustainability Engineering; Energy Consumption/Generation profiling and forecasting; Energy optimisation at building and local communities level; Transient overvoltage analysis in power systems; Optimal right of way evaluation of gas streams, as related to possible AC interferences; Grounding system analysis and design for GIS Substations; Lightning protection of infrastructures; Investigations through numerical analysis and <i>in situ</i> evaluations of AC/DC interferences; Electromagnetic inverse problems
Energy Consulting	Energy evaluation, solutions and methodologies regarding the efficient use of energy; Investigation of electromagnetic interference problems; Power quality evaluations, diagnosis and solutions for industry.
Applied engineering services	Energy audit for industrial/residential consumers; Energy consumption profile; Power loss evaluation and identification in power systems; Energy quality measurements, filtering solutions; Measurements/testing of: quantity and quality energy indicators; Grounding system analysis and design for GIS Substations.
Training	Design of energy efficient systems and nZEB Buildings; Numerical analysis and computational geometry applied in engineering problems; Support and applied techniques regarding the practical implementation of case study numerical interferences, lightning protection, optimal right of way; Energy audits

MEDICAL ENGINEERING RESEARCH GROUP

Contact details

Name	Medical Engineering
Acronym	ME
Logo	
Site	www.im.utcluj.ro
Address	26-28 G. Baritiu Str., 400027, Cluj-Napoca, Romania
Faculty Department	Faculty of Electrical Engineering, Electrotechnics and Measurements Department
Telephone	+40 264 401482, +40 264 402379
Fax	+40 264 594548
Director	Prof. Dr. Eng. Roman Nicolae Marius
e-mail	Marius.Roman@ethm.utcluj.ro



Areas of expertise

Laboratory of **Biomedical instrumentation, Applied medical electronics, Clinical engineering, Digital biosignal processing**
 Laboratory of **Biomedical Signal Processing, Biomedical Measurements, Biomedical Data Transmission, Medical Physics, Physiological modelling, Reverse engineering of cardiovascular devices, Medical Image Analysis**

Team

Prof. Dr. Eng. Radu Vasile Ciupa, Prof. Dr. Eng. Nicolae Marius Roman, Prof. Dr. Eng. Dan Rafiroiu, Prof. Dr. Eng. Mihai Munteanu, Assoc. Prof. Dr. Eng. Simona Vlad, Lecturer Dr. Eng. Anca Nicu, Lecturer Dr. Eng. Angela Lungu, Assoc. Prof. Med. Elena Gligor, Assoc. Prof. Dr. Med. Adrian Iancu, Senior Researcher Dr. Eng. Mircea V. Pusca, Senior Researcher Dr. Eng. Stefan Gergely, Dr. Eng. Vasile Pompas, Prof. Dr. Eng. Math, Dan Doru Micu, Drd. Eng. Ciprian Mugurel Fort, Drd. Eng. Pop Kun Dorel

Representative projects

“**COST Action MyWAVE CA17115**”, www.cost.eu/COST_Actions/ca/CA17115?management (2018-2023)
 “**Scaun Rulant Pentru Persoane cu Dizabilități Locomotorii**”, (2019-2021)
 “**Burse doctorale si postdoctorale pentru cercetare de excelenta**”, POSDRU/159/1.5/S/134378 UTCN, (2014-2015)
 “**VIPRO Platform**”, PN-II-PT-PCCA-2013-4-2009, (2013-2016)
 “**Advancing University Education in Biomedical Engineering and Health Management in Kyrgyzstan**”, KyrMedu
 MeDDiCA, “**Medical Devices Design in Cardiovascular Applications**”, European FP7 project, www.meddica.eu
 “**Sensors and equipment for the quality control of various food supplies**”, PN II, (2007-2013)
 “**Complex architecture for monitoring and medical data transmission**”, Exploratory research project, (2009-2012)
 SPINSTIM, “**Functional stimulation of the spinal cord**”, Romanian-Austrian bilateral contract, (2009-2011)
 “**Neural magnetic stimulation**”, PNII-IDEI, (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Munteanu M.S., Magda A., Ciorap R., Rusu C. and Vladareanu L. – “EOG Signal processing algorithm used in eye movement detection”, Proceedings of Modern Power System Conference 2019
2. Farago P., Băbțan A.-M., Galatus R., Groza R., Roman N.M., Feurdean C.N., Ilea A. „*A Side-Polished Fluorescent Fiber Sensor for the Detection of Blood in the Saliva*”, IFMBE Proceedings, volume 71, pp. 23-28, 2018, Springer International Publishing, ISBN 978-981-13-6206-4, ISSN 1680-0737
3. Iudean, D., Laze, P., Munteanu, R., **Munteanu, M.**, Mercea, V. – “Pilot -study of a low-cost iontophoresiss device” 2019 7th E-Health and Bioengineering Conference, EHB 2019, Iasi, Romania
4. Mureșan V., Roman N.M., Coloși T., Abrudean M., Stan O.P., Bunta O. „*Numerical Simulation of the Temperature Propagation in Superposed Biological Media with Applications in Dental Treatment*”, IFMBE Proceedings, volume 71, pp. 123-130, 2018, Springer International Publishing, ISBN 978-981-13-6206-4, ISSN 1680-0737

5. Ancău D., Roman N.M., Ancău M., „Evaluating a Method of Offline Detection of P₃ Waves”, IFMBE Proceedings, volume 71, pp. 139-143, 2018, Springer International Publishing, ISBN 978-981-13-6206-4, ISSN 1680-0737
6. Pop-Coman P., Roman N.M., Steopan M., Ispas V., Bugnar S., „Voice Controlled Wheelchair for People With Disabilities”, IFMBE Proceedings, volume 71, pp. 255-260, 2018, Springer International Publishing, ISBN 978-981-13-6206-4, ISSN 1680-0737
7. Holonec R., Vlad S., Roman A.I., Rápolti L. “Monitoring of Obstructive Sleep Apnea Using Virtual Instrumentation Techniques”, 6th International Conference on Advancements of Medicine and Health Care through Technology; 17–20 October 2018, *IFMBE Proceedings*, vol 71 (2019), ISBN 978-981-13-6206-4, pp. 85-90. Springer, Singapore
8. Holonec R., Vlad S., Rapolti L. “Application for Detection of Epileptic Seizures”, 6th International Conference on Advancements of Medicine and Health Care through Technology; 17–20 October 2018, Cluj-Napoca, Romania. *IFMBE Proceedings*, vol 71 (2019), ISBN 978-981-13-6206-4, pp. 91-96. Springer, Singapore
9. Fort C.M., Ciupe A.M., Vlad S., „An ECG Front-End Device based on ADS1298 Converter”, Int. Conf. on Advancements of Medicine and Health Care through Technology; 12th-15th October 2016 Cluj-Napoca, Romania, *IFMBE Proceedings*, Vol. 59 (2017), ISBN 978-3-319-52874-8, pp. 99-102
10. C. M. Forț, S. Gergely and A. O. Berar “Development of Wireless Biomedical Data Transmission and Real Time Monitoring System” International Conference on Advancements of Medicine and Health Care through Technology; 12th - 15th October 2016, Cluj-Napoca, Romania IFMBE, vol.59, DOI: 10.1007/978-3-319-52875-5 pag.327-330
11. Forț C. M., Roman N. M., and Gergely S. “Development of Bluetooth Enabled Pediatric Temperature Monitoring Device” International Conference on Advancements of Medicine and Health Care through Technology; 17–20 October 2018, Cluj-Napoca, Romania, IFMBE, volume 71 DOI:10.1007/978-981-13-6207-1 pag.221-226,
12. Gergely S. and Fort C.M. “Integrated computing unit for autonomous solar tracker with concentrated power” 3th Bilateral meeting on green energy (12th ICPIM2019)
13. Kun R. Pop, Munteanu M., Rafiroiu D., “Development of a Complex Acquisition and Storage System of Medical Data used in a Clinical Environment” International Conference on Advancements of Medicine and Health Care through Technology, MEDITECH 2016 Book Series: IFMBE Proceedings Volume: 59 Pages: 223-227 Published: 2017
14. Ignat M.C., Farago P., Hintea S., Roman M.N., Vlad S., „A Single-Character Refreshable Braille Display with FPGA Control”, Int. Conf. on Advancements of Medicine and Health Care through Technology; 12th-15th October 2016 Cluj-Napoca, Romania, *IFMBE Proceedings*, Vol. 59 (2017), ISBN 978-3-319-52874-8, pp. 63-66
15. Iancu A., Rafiroiu D., Marc M., “Is Coronary Wedge Pressure a Technique to Identify High-Risk Patients Who May Benefit From Alternative Treatment in Acute Myocardial Infarction? Is this the next step?” *JACC: Cardiovascular Interventions*, vol. 9, no. 1, 2016, pp: 104-105.
16. D'Avenio G., Wang G., Rafiroiu D., De Angelis G., Grigioni M., “PIV and CFD Insight into the Hinge and Near-Hinge Flow Fields of Bileaflet Mechanical Heart Valves”, XIV MEDITERRANEAN CONFERENCE ON MEDICAL AND BIOLOGICAL ENGINEERING AND COMPUTING 2016, Book Series: IFMBE Proceedings Vol. 57 Pge.688-693
17. Vlad S., Demea S., Demea H., Holonec R., “Neural network classifier for glaucoma diagnosis”, Proceedings of E-Health and Bioengineering Conference (EHB), 2015, Iasi, Romania, 19-21st November 2015, DOI: 10.1109/EHB.2015.7391596
18. Corneliu Lungoci, Daniel Moga, Vlad Muresan, Dorin Petreus, Nicoleta Stroia, Rozica Moga, Mihai Munteanu, Iulian Raus, Valentin Muntean, Aurel Ion Mironiuc – „Hyperthermic Intraperitoneal Chemotherapy Approach Based on Cyber-Physical System Paradigm”, în *Journal of Control Engineering and Applied Informatics*, vol. 17, no. 3, 2015
19. M. Cretu, A. Darabant, and R. V. Ciupa, "Magnetic Stimulation of the Spinal Cord: Evaluating the Characteristics of an Appropriate Stimulator," *Artificial Organs*, vol. 39, pp. 841-848, Oct 2015.

Significant solutions:

High efficiency solution for medical telemetry ECG. Proved method in pathological PCG analysis.

Efficient mathematical algorithms used in biomedical signal processing.

A data read algorithm based on ZACwire, the protocol for temperature precision sensor TSic 306

Development of portable biomedical instrumentation.

Smart solutions and low cost systems for medical and biomedical signal processing and transmission;

Smart solutions to assess the patient rehabilitation in post-traumatic periods;

High accuracy reconstruction of the 3D geometry of vessels, cavities and cardiovascular devices;

Development of a multiscale CFD-FSI double-valve model of the left ventricle to study the valve-valve interaction;

Experimental and computational study of the hemolytic and cavitation effects of bileaflet mechanical heart valves;

Computational analysis of thrombus absorption efficiency for different commercial catheter designs;

Computational assessment of high frequency electromagnetic (cell phone) field effects on implanted carotid stents;

Products and technologies:

Low consumption battery powered DSP devices for ECG and PCG signal analysis

The offer addressed to the economic environment

Research & development	Datronix Computer Ltd., Cluj-Napoca, www.datronix.ro National Institute for Research and Development of Isotopic and Molecular Technologies www.itim-cj.ro Military Emergency Hospital Dr. Constantin Papilian, Cluj-Napoca, www.smucluj.ro County Emergency Hospital Bistrita-Nasaud, http://spital.bistrita.ro/
Consulting	Consulting in the areas of medical signal measurements, medical signal processing and data transmission, medical image processing, FDA regulations of cardiovascular devices.
Training	CFD-FSI analysis, Multiphysics and multiscale modelling, Computational methods for cardiovascular devices design, Computational methods for electromagnetic dosimetry

RESEARCH LABORATORY AND SUSTAINABLE DEVELOPMENT ÎN ELECTRONICS AND POWER ELECTRONICS

Contact details

Name	Research Laboratory and Sustainable Development in Electronics and Power Electronics
Acronym	RLSDEPE
Logo	
Site	http://epe.utcluj.ro
Address	Observatorului Str., No. 2, Rooms 9B and 12B, Cluj-Napoca, Romania
Faculty Department	Faculty of Electrical Engineering Electrical Machines and Drives Department
Telephone	+40 264 202828
Director	Assoc. Prof. Ph.D. Eng. Petre Dorel Teodosescu
Founder	Prof. Ph.D. Eng. Richard Marschalko
e-mail	Petre.Teodosescu@emd.utcluj.ro



Areas of expertise

**DC and AC high efficiency converters;
PWM and PFM converters control strategies ;
High power factor and/or power conditioning converters;
Power electronics for high efficiency lighting systems;
High frequency, high power density converters for motor drive and renewable energy.**

Team

Assoc. Prof. Ph.D. Eng. Petre-Dorel Teodosescu, Lect. Ph.D. Eng. Mircea Bojan, Lect. Ph.D. Eng. Călin Mărginean, Assist. Eng. Norbert Csaba Szekely, Assist. Eng. Vasile Mihai Suciu, Assist. Eng. Sorin Ionuț Salcu, Eng. Lucian Nicolae Pintilie, Eng. Mihai Adrian Iuoraș, Eng. Alexandru Mădălin Păcuraru.

Representative projects

MICROINV – "High-power density and high efficiency micro-inverters for renewable energy sources"; Action: POC-A1-A1.2.3-G-2-15 Knowledge Transfer Partnerships, (2017-2021);
CIA_CLIM - "Smart buildings adaptable to the effects of climate change" - PNIII-P1-1.2 PCCDI 2018, (2018-2020);
IEDPFC – "Innovative Electronic Device for Power Factor Correction", PN-II-PT-PCCA-2013-4-0914, (2014-2017);
"Influence of DC-Link capacitor aging on the PWM converters operation", Mobility and Environment: Researches in the fields of motor vehicle industry, energetics and environment in the Middle - and west -Transdanubian Regions of Hungary, by European Union and co-financed by the European Regional Development Fund" (2010-2013);
"Research on the Ecological Energy Conversion Methods with the help of PWM AC- to - DC Converters", CNCIS, (2004-2006).

Significant results

The most representative publications of the past 5 years:

1. Teodosescu, P.D.; Szekely, N.C.; Bojan, M.: - "Flexible System for Practical, Hands-On Power Electronics Teaching", MPS 2019 - International Conference – 8th Edition International Conference on Modern Power Systems, 21-23 May 2019, Cluj-Napoca, Romania, DOI: 10.1109/MPS.2019.8759702; ISBN 978-1-7281-0750-9;
2. M. Chirca, M. Dranca, P. Teodosescu and S. Breban, "Limited-Angle Electromechanical Actuator for Micro Wind Turbines Overspeed Protection," 2019 11th International Symposium on Advanced Topics in Electrical Engineering (ATEE), Bucharest, Romania, 2019, pp. 1-6.
3. V. M. Suciu, S. I. Salcu, L. N. Pintilie, P. D. Teodosescu and Z. Mathe, "Theoretical efficiency analysis of a buck-boost converter for wide voltage range operation," 2018 10th International Conference on Electronics, Computers and Artificial Intelligence (ECAI), Iasi, Romania, 2018, pp. 1-4., doi: 10.1109/ECAI.2018.8679063;

4. Szekely, N.C.; Bojan, M.; Salcu, S.I.; Teodosescu, P.D.: - "LED performance analysis under various current waveforms", ECAI 2018 - International Conference – 10th Edition Electronics, Computers and Artificial Intelligence, 28 June -30 June, 2018, Iași, România, DOI: 10.1109/ECAI.2018.8678988; ISBN 978-1-5386-4901-5;
5. Teodosescu Petre Dorel, Szekely Norbert Csaba, Sabau Madalina Sabina and Bojan Mircea, Analysis of a Resonant AC-AC LED Driver, Optoelectronics, Advanced Device Structures, Edited by Sergei Pyshkin, Published: July 12th 2017, ISBN: 978-953-51-3370-4, DOI: 10.5772/65136;
6. Gros, Ioana-Cornelia; Popa, Dan-Cristian; Teodosescu, Petre Dorel; et al., A Survey on Green Energy Harvesting Applications Using Linear Electric Generators Conference: 7th International Conference on Modern Power Systems (MPS) Location: Cluj Napoca, ROMANIA Date: JUN 06-09, 2017;
7. Chirca, Mihai; Oprea, Claudiu; Teodosescu, Petre-Dorel; et al., Optimal Design of a Radial Flux Spoke-Type Interior Rotor Permanent Magnet Generator for Micro-Wind Turbine Applications Conference: International Conference on Applied and Theoretical Electricity (ICATE) Location: Craiova, ROMANIA Date: OCT 06-08, 2016, Book Series: International Conference on Applied and Theoretical Electricity Published: 2016;
8. Tiberiu Rusu, Petre Dorel Teodosescu, Adrian-Cornel Pop, Practical implementation of a half-bridge SRM converter for low power applications The 18th National Conference on Electrical Drives "CNAE 2016", ACTA ELECTROTECHNICA, Volume 57, Number 3-4, 2016, Special Issue, ISSN 2344-5637, pp. 473-477;
9. Petre Teodosescu, Madalina Sabau, Norbert Szekely, Mircea Bojan, Richard Marschalko, Theoretical Analysis of the Commutation Frequency Range for a PWM AC - to -DC Converter with Current Hysteresis Modulation, The 18th National Conference on Electrical Drives "CNAE 2016", ACTA ELECTROTECHNICA, Volume 57, Number 3-4, 2016, Special Issue, ISSN 2344-5637, pp. 490-496;
10. Sabau, M.S, Szekely N.C, Teodosescu PD, "Electronic device for LED lighting Systems", *The official Catalogue of the ~Cadet Inova~ Exhibition, The Scientific Bulletin Addendum*, No.1, 2016, "Nicolae Balcescu" Land Forces Academy Publishing House, pp 133-135;
11. Teodosescu, Petre-Dorel; Bojan, Mircea; Vese, Ioana-Cornelia; et al., RESEARCH CONCERNING UNIFIED ELECTRONIC LIGHTING DEVICES PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE Volume: 16 Issue: 2 Pages: 226-234 Published: APR-JUN 2015;
12. Teodosescu, P. D.; Bojan, M.; Marschalko, R., Resonant LED driver with inherent constant current and power factor correction, ELECTRONICS LETTERS Volume: 50 Issue: 15 Pages: 1087-1088 Published: JUL 17 2014
13. Teodosescu P.D., Negrea S.T., Bojan M., Marschalko R., "Local Grid Power Quality Improvements by the use of a High Power Factor LED Device", *49th International Universities Power Engineering Conference (UPEC)*, ClujNapoca, ROMANIA, Sep 02-05, 2014.

Patents:

1. RO131166-B1 – Electro-mechanical actuator with electronic control device, 30 Aug 2018 (Romanian);
2. EP3121952-B1 - Operating method of switched reluctance motor, 05 Dec 2018 (European);
3. RO131169-B1 - Electronic device for led lighting systems, 28 Jun 2019 (Romanian);
4. EP3300462-B1 - Capacitor direct current (DC)-link arrangement, 11 Dec 2019 (European).
5. A201900915 – Patent Application – Interleaved Buck-Boost electronic converter
6. A201900916 – Patent Application – DC Micro-grid and its control method

Significant solutions:

1. Introducing the new concepts of Line Conditioning Strategies - Simple Line Conditioning, Active Line Conditioning, Complex Line Conditioning and Complex Power Factor Corrections – with the help of PWM AC- to - DC Converters.
2. Development and practical implementation of several methods for Active Line Conditioning and Complex Power Factor Corrections strategies.
3. Development and practical implementation of new electronic converters for motor control, renewable energy and LED lighting applications.

The offer addressed to the economic environment

Research & development	RLSDEPE can cover fundamental research and development activities regarding electronics and power electronic domain, thus the mathematical analyses, software simulations, practical implementation and testing for different AC/DC power converters for small to medium power applications. The research activities can cover domains as: Energetics (power conditioning converters, uninterruptible power supplies, renewable energy converters and control strategies), Automotive (main power traction and battery charge converters, auxiliary converters for ventilation, trajectory control, electronic lighting, etc.), Lighting (High Efficiency LED drivers), converters for general motor control applications.
Consulting	The experience of the RLSDEPE members in the field of Electronics and Power Electronics could offer to the private sector technical consulting, documentation and feasibility studies. The practical implementation services are one of the strongest assets regarding RLSDEPE, thus the Laboratory can offer services regarding fundamental and theoretical research, concept studies, simulations, modelling and practical experimentations.
Training	RLSDEPE, through the experience of his members could coordinate theoretical and/or applicative training services in the field of Electronics, Power Electronics, Energetics Power Electronics Systems, CAD Electronics Circuits Modelling and Simulation, Development, Testing and Technical Services of Electronic Equipment.

CENTER OF APPLIED RESEARCHES IN ELECTRICAL ENGINEERING FOR SUSTAINABLE DEVELOPMENT

Contact details

Name	Center of Applied Researches in Electrical Engineering for Sustainable Development	<i>GreenMot Lab</i> with a testbench for testing electrical machines up to 4 phases, 125kW and 12,000r/min	
Acronym	CCAIEDD		
Logo		Permanent magnet synchronous machine of 20kW and 26,000r/min	
Site	http://memm.utcluj.ro/ccaiedd/en/index.html	150V and 200A power converter	
Address	2 Observatorului str., 400489 Cluj-Napoca, Romania		
Faculty Department	Faculty of Electrical Engineering Electrical Machines and Drives Department		
Telephone	+40 264 401827		
Fax	+40 264 593117		
Director	Prof. Dr. Eng. Loránd Szabó		
e-mail	Lorand.Szabo@emd.utcluj.ro		

Areas of expertise

Design, modeling and optimization of electrical machines & drives for energy efficient applications in industrial, automotive and renewable energy fields
Control of electric and electromechanical systems
Condition monitoring, fault tolerance and diagnosis of electromechanical systems
DSP, microcontroller and FPGA programming
Hardware-in-the-loop (HiL) simulation in hybrid-electric vehicles

Team

Prof. Dr. Loránd Szabó, Prof. Emer. Dr. Ioan-Adrian Viorel, Prof. Emer. Dr. Vasile Iancu, Prof. Dr. Horia Hedeşiu, Prof. Dr. Claudia Marţiş, Assoc. Prof. Dr. Csaba Szász, Assoc. Prof. Dr. Daniel Fodorean, Assoc. Prof. Dr. Dan-Cristian Popa, Assoc. Prof. Dr. Florin Jurca, Assoc. Prof. Dr. Ştefan Breban, Lecturer Dr. Claudiu Oprea, Lecturer Dr. Mircea Ruba. Postdoc researcher: Dr. Áron Popp, Ph.D. students: Florin Pop Pigleşan, Radu Andrei Marţiş, Sorina Ciornei, Andreea-Mădălina Nicorici, Răzvan Inţe, Raul Nemeş, Sorin Iulian Cosman, Claudia Pop, Cristina Moldovan, Adriana Tintelecan, Iulia Văscan.

Representative projects

URBIVEL – Advanced technologies for intelligent urban electric vehicles, project co-financed by the European Regional Development Fund through Competitiveness Operational Program 2014-2020 (2016-2021). Director: Prof. Dr. Claudia Marţiş. <https://urbivel.utcluj.ro>.
INTERACT – European industrial doctorate on next generation for sustainable automotive electrical actuation, H2020-MSCA-ITN-2017 (2018-2021). Director: Prof. Dr. Claudia Marţiş. <https://interact.utcluj.ro>.
Electromagnetic modeling, simulation and optimization of induction machines for automotive industry. Beneficiary: Ohio State University (USA). Director: Assoc. Prof. Dr. Dan-Cristian Popa (2018-2019).
Zero airgap induction motor. Beneficiary: Ohio State University (USA). Director: Assoc. Prof. Dr. Dan-Cristian Popa (2018-2019).
PANDA – Powerful Advanced H-Level. Digitalization Architecture for models of electrified vehicles and their components, H2020-LC-GV-2018 (2018-2021). Partner coordinator: Prof. Dr. Claudia Marţiş. <https://project-panda.eu>.
SWTOMP – Small Wind Turbines Optimization and Market Promotion, ERANet-LAC – Network of the European Union, Latin America and the Caribbean Countries on Joint Innovation and Research Activities, (2017-2019). Partner coordinator: Prof. Dr. Loránd Szabó. <https://memm.utcluj.ro/SWTOMP>.
SMILE-EV – Smart Conductive Charging Station, Fixed and Mobile, for Electric Vehicles, PN III – PCCDI (2018-2021). Partner coordinator: Assoc. Prof. Dr. Daniel Fodorean. <http://www.smile-ev.usv.ro>.
EXTWIG – Experimental validation of a VAWT with counter-rotating rotors, PN III – PCCDI (2017-2018). Partner coordinator: Assoc. Prof. Dr. Ştefan Breban. http://www.comoti.ro/ro/Proiect_64%20PED.htm.
ESPESA – Strengthening the Research Potential of CAREESD in the Field of Electromechanical Systems and Power Electronics for Sustainable Applications, H2020-TWINN-2015 - Twinning Coordination and support actions

(2016-2018). Director: Prof. Dr. Claudia Martiș. <https://cordis.europa.eu/project/id/692224>.

ELIMPUS – Efficient Lightweight Electro-Magnetic Propulsion System for Electric Vehicles, Young Team - TE PNII

(2015-2017). Director: Assoc. Prof. Dr. Daniel Fodorean. <https://elimpus.utcluj.ro>.

Significant results

The most representative publications of the past 5 years:

1. L. Szabó, **A survey on modular variable reluctance generators for small wind turbines**, IEEE Transactions on Industry Applications, vol. 55, no. 3, pp. 2548-2557, 2019.
2. C.V. Pop, D. Fodorean, C. Husar, C. Irimia, **Structural behavior evaluation of an in-wheel motor based on numerical and experimental approach**, Electrical Engineering, 2019, DOI: 10.1007/s00202-019-00774-0.
3. R.O. Nemeș, S.M. Ciornei, M. Ruba, C. Martiș, **Real-time simulation of scaled propulsion unit for light electric vehicles**, Electrical Engineering, 2019, DOI: 10.1007/s00202-019-00773-1.
4. Ș.D. Cîrstea, C.S. Martiș, A. Cîrstea, A. Constantinescu-Dobra, M.T. Fülöp, **Current situation and future perspectives of the Romanian renewable energy**, Energies, vol. 11, no. 12, p. 3289, 2018.
5. S. Ciceo, C.T. Faria, J. Gyselinck, C. Martiș, **Multi-attribute, system-level design process for automotive powertrain electric drives: an integrated approach**, SAE International Journal of Alternative Powertrains, vol. 7, no. 2, pp. 117-128, 2018.
6. M. Ruba, F. Jurca, L. Czumbil, D.D. Micu, C. Martiș, A. Polycarpou, et al., **Synchronous reluctance machine geometry optimisation through a genetic algorithm based technique**, IET Electric Power Applications, vol. 12, no. 3, pp. 431-438, 2017.
7. D. Fodorean, L. Idoumghar, M. Bréviillers, P. Minciunescu, C. Irimia, **Hybrid differential evolution algorithm employed for the optimum design of a high-speed PMSM used for EV propulsion**, IEEE Transactions on Industrial Electronics, vol. 64, no. 12, pp. 9824-9833, 2017.
8. A. Dziechciarz, C. Martiș, **Simplified model of synchronous reluctance machine with optimized flux barriers**, Electrical Engineering, vol. 99, no. 4, pp. 1207-1216, 2017.
9. P. Dúbravka, P. Rafajdus, P. Makys, L. Szabó, **Control of switched reluctance motor by current profiling under normal and open phase operating condition**, IET Electric Power Applications, vol. 11, no. 4, pp. 548-556, 2017.
10. A. Câmpăanu, R. Munteanu, V. Iancu, **About dynamic stability of high power synchronous machine. A review**, Revue Roumaine des Sciences Techniques - Serie Électrotechnique et Énergétique vol. 62, no. 1, pp. 8-13, 2017.
11. D. Fodorean, M. Sarrazin, C.S. Martiș, J. Anthonis, H. Van der Auweraer, **Electromagnetic and structural analysis for a surface mounted PMSM used for light-EV**, IEEE Transactions on Industry Applications, vol. 52, no. 4 (July-August 2016), pp. 2892-2899, 2016.
12. L. Frosini, C. Harlișca, L. Szabó, **Induction machine bearing faults detection by means of statistical processing of the stray flux measurement**, IEEE Transactions on Industrial Electronics, vol. 62, no. 3, pp. 1846-1854, 2015.
13. M. Diko, P. Rafajdus, P. Makys, P. Dúbravka, L. Szabó, M. Ruba, **A novel concept of short-flux path switched reluctance motor for electrical vehicles**, Advances in Electrical and Electronic Engineering, vol. 13, no. 3, pp. 206-211, 2015.

Significant solutions:

Prototypes and laboratory models of special electrical machines; static converters; fault detection and fault tolerant systems; electrical machines MiL and HiL testing and evaluation procedures, etc.

Products and technologies:

Microcontroller based boards for motor control, energy management and position detection based on resolvers, DSP development boards for motor control and diverse applications, FPGA-based development boards for motor control and diverse applications, energy management: on board on light electric vehicles and hybrid power sources, HiL testing platforms for electric vehicle propulsion and auxiliaries systems.

Patents:

Ș. Breban, P.-D. Teodosescu, A.-V. Neag, M. Chirca, **Electronically controlled electromagnetic actuator**, patent no. RO131166/2018.

Ș. Breban, M. Dranca, I. Malael, **Airborne wind power generation system**, patent proposal no. A00673/2019.

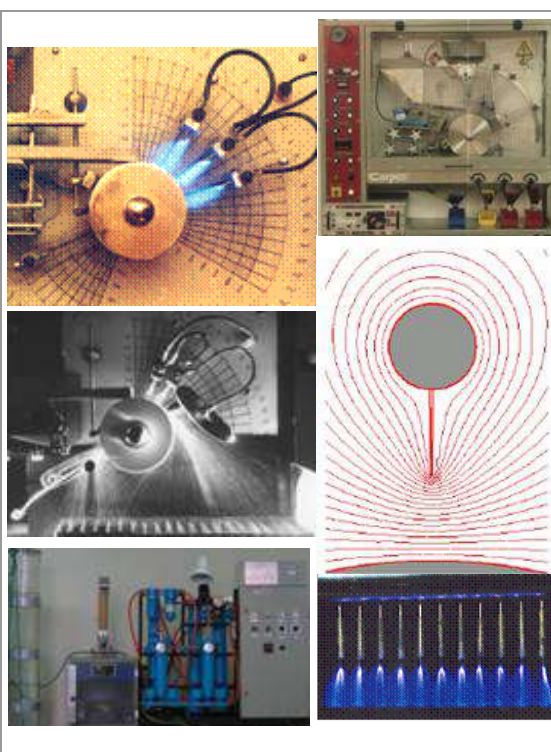
The offer addressed to the economic environment

Research & development	Electrical machines design and optimization Electrical drives and control based on microcontrollers, DSPs and FPGA devices Electromechanical systems for smart, green and integrated transportation Secure, clean and efficient renewable energy generation and storage systems Energy management on hybrid electrical power sources Offering advanced technical solutions for industrial clients in all our research fields. Seeking for research & development partners (both from industry and academia) in all the fields of expertise of the center.
Consulting	Offering consultancy services for companies in all the fields of expertise of the center. Offering applied engineering services for companies in all our fields of expertise.
Training	Offering training for under and post graduate students, Ph.D. students, engineers working in research and industry in all the fields of expertise of the Center.

HIGH INTENSITY ELECTRIC FIELDS LABORATORY

Contact details

Name	High Intensity Electric Fields Laboratory
Acronym	LCEI
Logo	
Site	http://users.utcluj.ro/~lcei/index_ro.html
Address	Headquarters: 26-28 G. Baritiu St., room 365 Research lab.: 103-105 Bd Muncii, room C201
Faculty Department	Faculty of Electrical Engineering Electrotechnics and Measurements Department
Telephone	+40 264 401429, +40 264 401678
Fax	+40 264 592055
Director	Prof. Dr. Eng. Adrian Samuila
e-mail	Adrian.Samuila@ethm.utcluj.ro



Areas of expertise

Equipment and technologies for electrostatic separation
 Modelling of electrostatic processes
 Ozonizing technologies for liquids
 Biological effects of high intensity electric fields.
 Consulting and technology transfer in these fields

Team

Prof. Adrian Samuila, Prof. Roman Morar, Prof. Alexandru Iuga, Prof. Lucien Dascalescu (Univ. Poitiers), Prof. Vasile Neamtu, Assoc. Prof. Ilie Suarasan, Assist. Prof. Sorin Budu, dr. Laur Calin, dr. Mihai Bilici, ing. Andrei Catinean.

Representative projects

“Program for promoting of electroseparation and ozonizing modern electrostatic technologies, training of human resources for research and infrastructure consolidation of the High-Intensity Electric Fields Laboratory”, Major Grant, World Banc, Romanian Government, (2000-2002)
 “Experimental researches on ozone influence in rehabilitation of wastewater from public sewerage networks”, Grant CNCSIS, (2001-2003)
 “Researches on developing electrostatic separation technology of muscovite”, Grant CNCSIS, (2005-2006)
 “Optimization of innovative methods of electrostatic separation applied in the industry of recycling materials”, (2005-2006)
 “Quality Improvement of quartz sands by electrostatic separation in high intensity electric field”, Grant CNCSIS, (2005-2007)
 “Fluidized bed tribocharging of multi-component mixtures of recyclable plastic materials”, Grant CNCSIS, (2005-2007)
 “Recovery technologies of metals and plastics from wastes of informatics and telecommunications equipment”, Project CEEEX, (2005-2007)
 “Electrostatic procedures for the recovery of copper and plastic materials from micronized waste” Project BRANCUSI 88 BM (2017-2018)
 “Optimized technologies with reduced impact on the environment for the advanced recovery of waste materials IT equipment” Project 84PCCDI - 01/03/2018 TRADE-IT (2018 – 2020)

Significant results

The most representative publications of the past 5 years:

1. M. Bilici, A. Catinean, L. Călin, A. Samuila. *The Effect of Charged Granules Agglomerations on the Electric Field Distribution of a Tribo-aero-electrostatic Separator*. 11th International Symposium on Advanced Topics in Electrical Engineering (ATEE). Bucharest, Romania, 2019, pp. 1-6, DOI: [10.1109/ATEE.2019.8724939](https://doi.org/10.1109/ATEE.2019.8724939)
2. Adrian Samuila, Lucian Dascalescu, Laur Calin, Mihai Bilici, Andrei Catinean. Recent Researches in Electrostatic Separation Technologies for the Recycling of Waste Electric and Electronic Equipment. TIM 19 Physics Conference, 29-31 May, Timisoara, Romania, pp. 1-10.
3. L. Calin, A. Catinean, M. Bilici, L. Dascalescu, A. Samuila. *Electrostatic separation of HIPS/ABS and HIPS/ABS-PC plastic mixtures from IT equipment using fluidized bed tribocharging*. International Conference on Sustainable Solid Waste Management, 26-29 June 2019, Heraklion, Greece, pp. 1-12.
4. Laur Călin, Andrei Călinean, Mihai Bilici, Adrian Samuila. *Recovery of Zinc and Brass from Spent Alkaline and Zinc-Carbon Batteries* The 17th International Waste Management and Landfill Symposium, 30.09.2019 - 04.10.2019, Santa Margherita di Pula, Cagliari, Italy, pp. 1-14.
5. L. Calin, M. Bilici, A. Samuila. *Improvement of the Fluidized Bed Tribocharging Device for Electrostatic Separation of Plastics from Electronic Medical Waste*. 6th International Conference on Advancements of Medicine and Health Care through Technology; 17-20 October 2018, Cluj-Napoca, Romania. IFMBE Proceedings, volume 71, pp 341-346.
6. Iuga, A., Samuila, A., Morar, R., Bilici, M., Dascalescu, L. *Tribocharging techniques for the electrostatic separation of granular plastics from waste electric and electronic equipment*. Particulate Science and Technology, Volume 34 (1), 2016, pp. 45-54. ISSN:0272-6351.
7. Buda, G., Samuila, A., Bilici, M., Atroune, S., Dascalescu, L. *Set Point Identification and Robustness Testing of a Triboelectrostatic Separation Process*. IEEE Transactions on Industry Application, Vol. 51(2), 2015, pp. 1153-1160.
8. Adrian Samuila, Mihai Bilici, Lucian Dascalescu. *Recycling of PS/PVC Granular Waste Using a Fluidized-Bed Two-Insulated-Rolls-Type Tribo-Aero-Electrostatic Separator*. The 9th International Symposium on Advanced Topics in Electrical Engineering, Bucurest, 2015, pp. 254-259
9. Younes, M., Younes, H., Sayah, M., Bilici, A., Samuila, L., Dascalescu, L. "Effect of spark discharges on the trajectories of insulating particles in roll-type corona-electrostatic separators. Experimental and numerical study", in *Journal of Electrostatics*, vol. 71, no. 1, 2013, pp. 84-91
10. G. Buda, A. Samuila, S. Atroune, M. Bilici, L. Dascalescu, "Set point identification of a tribocharging process for mixed granular solids", in *Journal of electrostatics*, vol.7, no. 3, 2013, pp. 407-412
11. Al Hajjar Nadim, Pitu Flaviu, Nicodim FiŃ, Pitu Florina, Popa Calin, Suarăsan Ilie, Eموke Pall. Effect of aqueous ozone solution on pancreatic cells. *Journal of Cell and Animal Biology* Vol. 6(2), pp. 25-28, 30 January, 2012.
12. Al Hajjar Nadim, Flaviu Pitu, Eموke Pall, Florina Pitu, Ilie Suarasan, Calin. Popa and Nicodim FiŃa. n vitro effect of ozonated saline on microorganisms involved in pancreatic and peripancreatic necrosis infection in severe acute pancreatitis. *African Journal of Microbiology Research* Vol. 6(3), pp. 611-616, 23 January, 2012
13. A. Iuga, A. Samuila, V. Neamtu, R. Morar, R. Beleca, S. Das, L. Dascalescu, "Removal of Metallic Particles from Acrylonitrile Butadiene Styrene Wastes Using Electrostatic Separation Methods", in *IEEE Transactions on Industry Application*, vol. 47, no. 1, 2011, pp. 322-330
14. L. Dascalescu, M. Bilici, C. Dragan, A. Samuila, Y. Ramdani, A. Tilmatine, "Robust Design and Capability Evaluation of a Tribo-aerodynamic Charging Process for Fine Particle" in *IEEE Transactions on Industry Application*, vol. 47, no. 3, 2011, pp. 1086-1092
15. C. Dragan, O. Fati, M. Radu, L. Calin, A. Samuila, L. Dascalescu, "Tribocharging of Mixed Granular Plastics in a Fluidized-Bed Device", in *IEEE Transactions on Industry Application*, vol. 47, no. 4, 2011, pp. 1922-1928

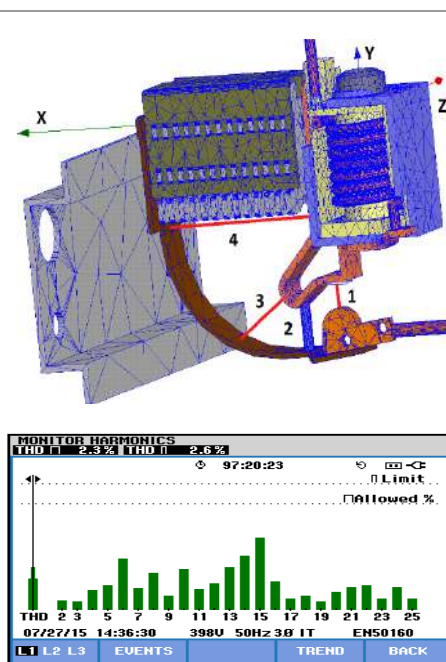
The offer addressed to the economic environment

Research & development	HIEFL is equipped with installations for electrostatic separations of granular materials, unique on a national scale and competitive on an international scale: ELSEP and ILES-1 roll carrier corona-electrostatic separators, SEP-1 plate type electrostatic separator, ILES-2 and TESS free fall separators, insulated rolls tribo-aero-electrostatic separator, free-fall corona electrostatic separator, ELSMOD roll carrier pilot separator. The list of the research equipment of HIEFL includes: regulated high-voltage supplies (0-100)kV, electromagnetic vibratory feeders for granular materials, tribocharging devices, experimental installation for liquids treatment (5 grams ozone/hour), Keithley digital electrometer, (30-100)kV resistive dividers, electrostatic kilo-voltmeter, laboratory ozone-meter, RETSCH SM300 cutting mill, TestPoint software, Modde -user-friendly software for the design of experiments, Superficial Charge Simulation Program.
Consulting & Training	Fundamental and applied research by projects, grants, programs in the domains: equipment and technologies for electrostatic separation, modelling of electrostatic processes, ozonizing technologies for liquids, biological effects of electric fields. Master and Doctoral studies in Electrostatics. Research and Development of experimental devices and industrial equipment using high-intensity electric fields. Promotion of new technologies in high intensity electric fields and orientation of research to medium and long term needs of the society. Scientific cooperation & integration in European Research Area. Quality in university education and scientific research.

POWER QUALITY AND ENERGY EFFICIENCY

Contact details

Name	Power Quality and Energy Efficiency
Acronym	CEE
Logo	
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Faculty Department	Faculty of Engineering Electrical, Electronic and Computer Engineering Department
Telephone	+40 264 202 975
Fax	+40 262 276 153
Director	Assoc. Prof. Dr. Eng. Liviu Neamt
e-mail	liviu.neamt@cunbm.utcluj.ro



Areas of expertise

Modern computer aided design, analysis and optimization of electrical equipment, based on Finite Element Method.
 Energy efficiency through power circulation improvement, enhanced technologies and renewable energies integration;
 Photovoltaic potential estimation;
 Monitoring, analysis and improvement of power quality;
 Measurement, testing and diagnosis in electrical installations;
 Measurement of non-ionising electromagnetic radiation in order to assess electromagnetic fields for the purpose of comparison against limits for human exposure

Team

Assoc. Prof. Dr. Eng. Liviu Neamt, Assoc. Prof. Dr. Eng. Olivian Chiver, Assoc. Prof. Dr. Eng. Mircea Horgos, Prof. Dr. Eng. Liviu Emil Petrean, Assoc. Prof. Dr. Eng. Zoltan Erdei, Assist. Prof. Dr. Eng. Eleonora Pop, Assist. Prof. Dr. Eng. Mihaela Stet, Assist. Prof. Dr. Eng. Cristian Barz.

Representative projects

“Assisted technology for electrical installation testing” - PN-III-P2-2.1-CI-2018-1296, 2018
“Assisted technology for designing, building and verifying earthing installations” - PN-III-P2-2.1-CI-2018-1293, 2018
“Electromagnetic field simulation of capacitive touch sensors”. Electrolux, Italy, 2015;
“Investigation of the circumstances and causes of the LV electrical equipment failure due to HV commutation at CEFD Solaris 56 MWp Ciuperceni”, Bester Generacion, Spain, 2015;
“Consulting services and earthing system testing on overhead power line 400 KV Gădălin – Cluj Est”, Emsens, 2014;
“Technical analysis of the power quality at UACE Dumbrăvița”, 2014.

Significant results

The most representative publications of the past 5 years:

1. Chiver, Olivian; Neamt, Liviu; Cristian, Barz; et al; *Study on the End Winding Inductance of Three-Phase Windings in Two Layers*, Tehnički vjesnik 26 (5), 1510-1514, 2019.
2. A. V. Hotea, R. Adrian Tirnovan and L. Neamt, *The Effects of Short Circuits at Medium Voltage Transformers*, 54th International Universities Power Engineering Conference (UPEC), Bucharest, Romania, pp. 1-3, 2019.
3. L. Neamt, H. Balan, O. Chiver and A. Hotea, *Considerations about Fault Loop Impedance Measurement in TN Low-Voltage Network*, 8th International Conference on Modern Power Systems (MPS), Cluj Napoca, Romania, pp. 1-4, 2019.
4. L. Neamt, H. Balan, O. Chiver and A. Hotea, *Considerations about Substation Grounding System Design*, 8th International Conference on Modern Power Systems (MPS), Cluj Napoca, Romania, pp. 1-4, 2019.
5. Neamt, Liviu; Petrean, Liviu; Chiver, Olivian; et al; *Some Considerations about Overvoltages During and After the Disconnection of a Photovoltaic Park*, 24th IEEE International Symposium on Design and Technology in Electronic Packaging (SIITME), Iasi, 239-242, 2018.

6. Chiver, Olivian; Neamt, Liviu; Cristian, Barz; et al., *Study on the Autonomous Asynchronous Generator*, 2018 International Conference and Exposition on Electrical and Power Engineering, EPE Iasi, 863-866, 2018.
7. Chiver, Olivian; Neamt, Liviu; Matei, Oliviu; et al., *Utilization of Finite Elements Programs and Matlab Simulink in the Study of a Special Electrical Motor*, International Journal of Advanced Computer Science and Applications, 8(4), 317-323, 2017,
8. Neamt, Liviu; Matei, Oliviu; Chiver, Olivian, *Finite Element Method Combined with Neural Networks for Power System Grounding Investigation*, International Journal of Advanced Computer Science and Applications, 8(2), 187-192, 2017,
9. Chiver, O.; Neamt, L.; Pop, E.; et al., *Single-phase PM synchronous motor simulation with Matlab/Simulink*, International Conference on Applied Sciences (ICAS2016), Book Series: IOP Conference Series-Materials Science and Engineering, Volume: 163, 2017.
10. Neamt, Liviu; Chiver, Olivian; Erdei, Zoltan; et al, *Considerations about Medium Voltage SF6 Switch Disconnecter Framework Design based on 3D Electrostatic FEA*, IEEE 16th International Conference on Environment and Electrical Engineering (EEEIC), Florence, 2016.
11. Chiver, Olivian; Neamt, Liviu; Pop, Eleonora; et al, *Identification of parameters of single-phase PM synchronous Motor*, IEEE 16th International Conference on Environment and Electrical Engineering (EEEIC, Florence, 2016.
12. Balan, H.; Neamt, L.; Buzdugan, M. I.; et al., *Fault current limiter with solid-state circuit breakers*, Conference: International Conference on Innovative Ideas in Science (IIS), Baia Mare, 2015, Book Series: IOP Conference Series-Materials Science and Engineering, Volume: 144, 2016.
13. Neamt, Liviu; Matei, Oliviu; Chiver, Olivian, "Optimised Methodology for Stepper Motor Simulation", *IEEE 15th International Conference on Environment and Electrical Engineering Rome*, pp: 1078-1082, 2015,
14. Neamt Liviu; Chiver Olivian; Bartis Madalin, "Capacitive Touch Sensors Sensibility For Different Ground Hatch And Shield Electrode Structures", *The 9th International Symposium on Advanced Topics in Electrical Engineering*, Bucharest, pp. 123-127, 2015.
15. Chiver, Olivian; Neamt, Liviu; Matei, Oliviu, "Comparative study on sudden short-circuit currents of a synchronous generator", *IEEE 15th International Conference on Environment and Electrical Engineering Rome*, pp: 1688-1693, 2015.

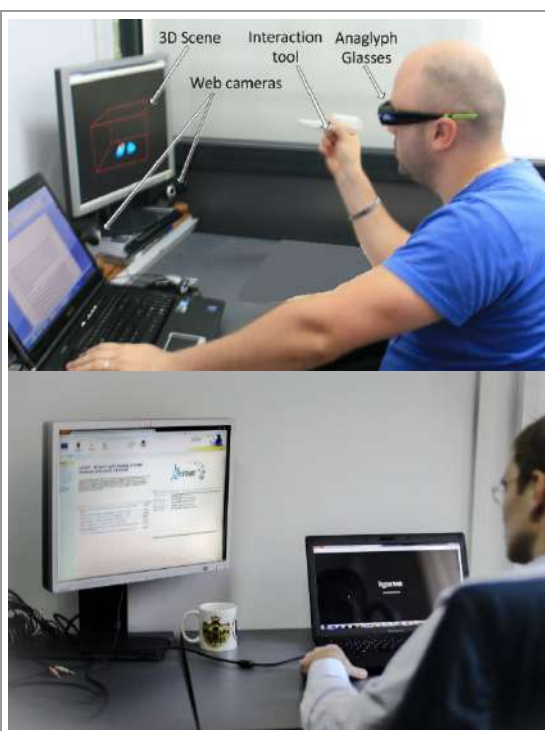
The offer addressed to the economic environment

Research & development	Electrical equipment analysis and optimization, based on Finite Element Method; Energy efficiency and better power quality trough power circulation improvement, based on computer assisted simulation; Development of enhanced technologies in energy conversion; Development of new testing and diagnosis methods in electrical installations.
Consulting	Audit, energy efficiency and power quality; Renewable sources potential estimation for feasibility studies; Renewable energy conversion systems integration; Measurement, testing and diagnosis in electrical installations, data processing and results interpreting. Measurement of non-ionising electromagnetic radiation in order to assess electromagnetic fields for the purpose of comparison against limits for human exposure.
Training	Romanian Energy Regulatory Authority certified courses for electricians, project supervising, experts, Romanian Energy Regulatory Authority certified courses for: energy auditors and managers; Measurement, testing and diagnosis in electrical installations using modern equipment and techniques; Renewable energies integration. Energy efficiency and power quality at consumers.

MULTIMEDIA TECHNOLOGIES AND TELECOMMUNICATIONS RESEARCH CENTRE

Contact details

Name	Multimedia Technologies and Telecommunications Research Centre
Acronym	CTMTC
Logo	
Site	http://ctmtc.utcluj.ro
Address	15 C-tin Daicoviciu street, room 431, 400020, Cluj-Napoca, Romania
Faculty Department	Faculty of Electronics, Telecommunication and Information Technology Communications Department
Telephone	+40 264 401317
Fax	+40 264 401317
Director	Prof. Dr. Eng. Aurel VLAICU
e-mail	Aurel.Vlaicu@com.utcluj.ro



Areas of expertise

Main Field: Information and communications technologies

Key words: e-learning, e-health, e-business, e-government, e-citizen, e-content, digital television HD / 3D, new Media, web services, multimedia databases, 3D video coding & compression, collaborative cloud, artificial intelligence, cognitive systems, trainable systems, intelligent interfaces, multimodal analysis and integration, image processing and analysis, artificial vision.

Team

Prof. Dr. Eng. Aurel Vlaicu, Assoc. Prof. Dr. Eng. Bogdan Orza, Assist. Dr. Eng. Șerban Meza, PhD. Stud. Aurelia Ciupe, PhD Stud. Alexandru Popa, Prof. Dr. Eng. Mircea Giurgiu, Dr. Eng. Adriana Stan, Assoc. Prof. Dr. Eng. Mihaela Gordan, Assist. Dr. Eng. Camelia Florea, Assist. Dr. Eng. Mihaela Caslariu, Assoc. Prof. Dr. Eng. Zsolt Polgar, Prof. Dr. Eng. Vasile Bota, Assist. Dr. Eng. Mihaly Varga, Prof. Dr. Eng. Virgil Dobrotă, Assoc. Prof. Dr. Eng. Daniel Zinca, Assist. Dr. Eng. Bogdan Rus, Assist. Dr. Eng. Tudor Blaga

Representative projects

VINIVITIS – “Complex, Integrated System for the Technological Optimisation and Superior Valorisation of Vineyard Sub-products”, PCCDI 2018 (2018-2020)
DIONASYS - “Declarative and Interoperable Overlay Network. Applications to Systems of Systems”, CHIST-ERA (2015-2017)
UCONNECT - “Implementation of Ubiquitous Connectivity for Public Transport, FP7 project, 2012-2014.
4WARD – “Architecture and Design for the Future Internet”, FP7-ICT-2007-1 No. 216041, 2008-2010
Wi-QoST: “Traffic and QoS Management in Wireless Multimedia Networks”, 2004-2008
CODIV “Enhanced Wireless Communication Systems Employing COoperative DIversity”, FP7, 2008-2010.
COST IC 1004 “Cooperative Radio Communications for Green Smart Environments”
COST 2100 “Pervasive Mobile & Ambient Wireless Communications”, 2007-2010;
Simple4All – “Speech synthesis that improves through adaptive learning” FP7 project, (2011-2014), www.simple4all.org,
Sound2Sense – “Making sense of speech sounds”, FP6 project (2007-2011), www.sound2sense.eu,
EU eContentPlus - “KeyToNature” (2008-2010), www.keytonature.eu
EU eTEN “EUROWEX – Online platform using digital signature for the management of university activities” (2006-2008), www.eurowex.org
“Image Processing, Information Engineering & Interdisciplinary Knowledge Exchange”, CEEPUS Network CII-AT-0042-05-0910,
Text2Speech – „Development of software services for text to speech synthesis in Romanian language” PNII INOVARE (2008-2010),
COMODICI – „Sistem de Control și Monitorizare la Distanță a Clădirilor Inteligente”, CEEX project (2006-2008)
SIMIMED – „Sistem integrat de management a informațiilor medicale utilizând standardul HL7”, PNII project (2007-2010)
INVITE – „Platformă Inteligentă Colaborativă pentru Dezvoltarea și Susținerea Mecanismelor Intreprinderilor

"Virtuale", PNII project – 12119 (2008-2011)

Significant results

The most representative publications of the past 5 years:

1. Meza, Radu Mihai; Meza, Serban Nicolae, A Triadic Formal Concept Analysis Approach to Analyzing Online Hate Speech in Facebook Comments BRAIN-BROAD RESEARCH IN ARTIFICIAL INTELLIGENCE AND NEUROSCIENCE Volume: 10 Issue: 1 Pages: 73-81 Published: JAN-FEB 2019
2. Diop, Abdou Khadre; Meza, Serban; Gordan, Mihaela; et al., LDA Based Classification of Video Surveillance Sequences Using Motion Information 20TH INTERNATIONAL CONFERENCE ON ADVANCED COMMUNICATION TECHNOLOGY (ICACT) Book Series: International Conference on Advanced Communication Technology Pages: 499-502 Published: 2018
3. L. Cremene, N. Gasko, M. Cremene, M. Suci, A. Vlaicu, and D. Dumitrescu, "Scarce-resource capacity sharing in cognitive radio environments: a new game theoretical model," Telecommunication Systems, vol. 66, no. 2, pp. 331-342, Oct 2017.
4. Gordan, Mihaela; Meza, Serban; Cislariu, Mihaela; et al., A Fuzzy Logic Approach for the Fast Approximate Computation of Image Transforms from Block JPEG DCT Coefficients PROCEEDING OF 2016 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR) Book Series: IEEE International Conference on Automation Quality and Testing Robotics Pages: 359-364 Published: 2016
5. Ciupe, Aurelia; Florea, Camelia; Orza, Bogdan; et al., A Bag of Words Model for Improving Automatic Stress Classification PROCEEDINGS OF THE SECOND INTERNATIONAL AFRO-EUROPEAN CONFERENCE FOR INDUSTRIAL ADVANCEMENT (AECIA 2015) Book Series: Advances in Intelligent Systems and Computing Volume: 427 Pages: 339-349 Published: 2016
6. Ciupe, Aurelia; Orza, Bogdan; Florea, Camelia; et al., Skill-Oriented Priority Scheduling for Solving the Resource Constrained Project Scheduling Problem 2015 IEEE 11TH INTERNATIONAL CONFERENCE ON INTELLIGENT COMPUTER COMMUNICATION AND PROCESSING (ICCP) Book Series: IEEE International Conference on Intelligent Computer Communication and Processing ICCP Pages: 85-92 Published: 2015
7. Ciupe, A.; Meza, S.; Vlaicu, A., DidaTec LMS as a Framework for Task Assignment Through Blended Learning Techniques International Conference on Social Media in Academia - Research and Teaching (SMART) Timisoara, ROMANIA SEP 18-21, 2014 SMART 2014 - SOCIAL MEDIA IN ACADEMIA: RESEARCH AND TEACHING Pages: 407-415 Published: 2015
8. Florea, Camelia, Gordan, Mihaela, Vlaicu, Aurel, et al., "Computationally Efficient Formulation of Sparse Color Image Recovery in the JPEG Compressed Domain", Journal Of Mathematical Imaging And Vision, Vol.49, Issue:1, Pp. 173-190, 2014
9. Moldovan, Roxana, Orza, Bogdan, Vlaicu Aurel, et al., "Advanced Human-Computer Interaction in External Resource Annotation", IEEE 19th International Conference on Automation, Quality and Testing, Robotics, Cluj Napoca, Romania, May 22-24, 2014
10. Z. I. Kiss, Z. A. Polgar, M. Giurgiu, and V. Dobrota, "Network coding based resource efficient congestion control for video streaming", Telecommunication Systems, vol. 55, pp. 499-512, Apr 2014.
11. Danciu, Marius, Gordan Mihaela, Florea Camelia, et al., "A Hybrid 3D Learning-and-Interaction-based Segmentation Approach Applied on CT Liver Volumes", Radioengineering, Vol.22, Issue 1, Special Issue: SI, Pp.100-113, Apr 2013

Products

www.didatec.ro – Learning content management system based on Microsoft technologies

www.e-start.ro – collaborative tool based on Moodle and Adobe Technologies

www.simac.utcluj.ro - SIMAC – sistem integrat de evaluare a activitatilor didactice, de cercetare si manageriale

The offer addressed to the economic environment

Research & development	text to speech synthesis, automatic speech recognition, Interactive Voice Response Systems, collaborative cloud systems for project management, data and network security, unified communication solutions, digital transmission systems: evaluation, design and optimization, Computational intelligence based image processing and analysis systems, color image enhancement and restoration for cultural heritage applications, 3D perception using stereoscopic techniques, Integrated platforms and services for innovative applications in eHealth, eGovernment, eBusiness, eMedia, eLearning and eLiving,
Consulting	Multimedia applications in the context of the mobile social web, cloud computing Education management and the use of IT&C for teaching in different blended-learning or e-learning scenarios: virtual collaboration tools, serious games, on-line social learning. Integrated platforms and electronic services for innovative applications in eHealth, eGovernment, eBusiness, eMedia, eLearning and eLiving.
Training	Audio-video systems engineering, video signal editing and processing, Complex acquisition and processing of visual information for augmented 3D reality, systems and application for processing / editing / rendering 3D video. Bi-modal (audio & video) and multimodal methods for image and video analysis

SPEECH PROCESSING RESEARCH GROUP

Contact details

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Site	http://speech.utcluj.ro
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Director	Prof. Dr. Eng. Mircea.Giurgiu
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Areas of expertise

Speech Processing:

- Automatic Speech Recognition (ASR): HMM-based speech recognition, Deep Neural Networks recognition;
- Text to Speech Synthesis (TTS): Voice Cloning, Speaking Style Transplantation;
- Speaker diarization, Emotion and speaking style automatic recognition;
- Online audio digital repositories: Web based interfaces, Metadata descriptors;
- Speech Coding at low bit rate for applications in telecommunications: RPE-LTP, CELP, MPEG, SPEEX;
- Secure authentication using voice, Interactive Voice Response Systems.

Text Processing:

- Sentiment analysis using dimensional and categorical models;
- Unsupervised sentence polarity prediction;
- Natural Language Processing using machine learning techniques;

Team

Prof. Dr. Eng. Mircea Giurgiu, Sl.dr. Eng. Adriana Stan.
External collaborators: drd. Maria Nutu, drd. Beata Lorincz.

Representative projects

ReTeRom – “Resources and technologies for developing human-machine interfaces in Romanian”, PCCDI 2018 – 2020, <http://speech.utcluj.ro/sintero>
SWARA – “Mobile System for Rehabilitative Vocal Assistance of Surgical Aphonia” PN-II-PCCA, 2014-2017, <http://speech.utcluj.ro/swara>
Simple4All – “Speech synthesis that improves through adaptive learning” (EC-FP7, 2011-2014), <http://simple4all.org>
Sound2Sense – “Making sense of speech sounds” (EC-FP6, 2007-2011), <http://www.sound2sense.eu>
Text2Speech – “Development of software services for text to speech synthesis in Romanian language” (PN II INOVARE, 2008-2010);
KeyToNature – (EC - eContent Plus, 2008-2010), <http://www.key2nature.eu>
EUROWEX – “Online platform using digital signature for the management of university activities” (EC – eTEN Trans European e-Services in the Public Interest, 2006-2008), <http://www.eurowex.org>
Pool2Business – “Project Organisation Online” (EC–EACEA-LLP, 2008-2010), <http://www.pool2business.eu/>

Significant results

The most representative publications of the past 5 years:

1. Beata Lorincz, Maria Nutu, Adriana Stan, "Romanian Part of Speech Tagging using LSTM Networks", In Proceedings of the IEEE 15th International Conference on Intelligent Computer Communication and Processing, Cluj-Napoca, Romania, 2019.
2. Maria Nutu, Beata Lorincz, Adriana Stan, "Deep Learning for Automatic Diacritics Restoration in Romanian", In Proceedings of the IEEE 15th International Conference on Intelligent Computer Communication and Processing, Cluj-Napoca, Romania, 2019.
3. David A. Braude, Matthew P. Aylett, Caoimhin Laoide-Kemp, Simone Ashby, Kristen M. Scott, Brian O Raghallaigh, Anna Braudo, Alex Brouwer, Adriana Stan, "All Together Now: The Living Audio Dataset", In Proceedings of Interspeech, Graz, Austria, 2019
4. Adriana Stan, "Input Encoding for Sequence-to-Sequence Learning of Romanian Grapheme-to-Phoneme Conversion", In Proceedings of the 10th IEEE International Conference on Speech Technology and Human-Computer Dialogue (SpeD), Timisoara, Romania, 2019.
5. Stan, Adriana; Dinescu, Florina; Tiple, Cristina; et al., The SWARA Speech Corpus: A Large Parallel Romanian Read Speech Dataset International Conference on Speech Technology and Human-Computer Dialogue (SpeD), published 2017
6. Stan, Adriana; Valentini-Botinhao, Cassia; Orza, Bogdan; et al., BLIND SPEECH SEGMENTATION USING SPECTROGRAM IMAGE-BASED FEATURES AND MEL CEPSTRAL COEFFICIENTS 2016 IEEE WORKSHOP ON SPOKEN LANGUAGE TECHNOLOGY (SLT 2016) Pages: 597-602 Published: 2016
7. Moldovan, Alexandru; Stan, Adriana; Giurgiu, Mircea, Improving Sentence-level Alignment of Speech with Imperfect Transcripts using Utterance Concatenation and VAD 2016 IEEE 12TH INTERNATIONAL CONFERENCE ON INTELLIGENT COMPUTER COMMUNICATION AND PROCESSING (ICCP) Book Series: IEEE International Conference on Intelligent Computer Communication and Processing ICCP Pages: 171-174 Published: 2016
8. Adriana Stan, Yoshitaka Mamiya, Junichi Yamagishi, Peter Bell, Oliver Watts, Rob Clark, Simon King, "ALISA: "An automatic lightly supervised speech segmentation and alignment tool", In *Computer Speech and Language*, vol. 35, pp. 116-133, 2016
9. Adriana Stan, Cassia Valentini-Botinhao, Mircea Giurgiu, Simon King, "Phonetic Segmentation of Speech using STEP and t-SNE", In *Proc. of the 8th International Conference on Speech Technology and Human-Computer Dialogue (SpeD)*, Bucuresti, Romania, 2015.
10. József Domokos, Adriana Stan, Mircea Giurgiu, "An Approach to Lexical Stress Detection from Transcribed Continuous Speech Using Acoustic Features", In *Proc. 22nd Telecommunications Forum*, Belgrade, Serbia, 2014.
11. O. Watts, S. Gangireddy, J. Yamagishi, S. King, S. Renals, A. Stan, M. Giurgiu, "Neural Net Word Representations for Phrase-Break Prediction Without a Part of Speech Tagger", In *Proc. IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)*, Florence, Italy, 2014.

Significant solutions:

Voice cloning in TTS using small amount of speech data, Automatic alignment of speech and text data, Improve the speech synthesis by improved speaker similarity, Accent prediction in text using only speech data, Text processing using Finite State Transducers, Statistical language modeling for speech recognition and text to speech synthesis, Blind speech denoising and dereverberation, Automatic speech segmentation at syllable level, Unsupervised and language independent syllabification using statistical methods, Broadcast news speaker diarization and speech music discrimination, Emotion and speaking style recognition from audiobook data; Sentiment polarity prediction using categorical and dimensional models, Polarity prediction using Vector Space Models,

Products and technologies:

1. ALISA - A lightly supervised speech segmentation and alignment tool;
2. TUNDRA - A corpus of 14 European languages collected from audiobooks;
3. NORMA - Statistical machine translation-based text NORMALization tool;
4. DEXTER - Speaker recognition and diarization in audio-video talk shows;
5. AUDIOOR - AUDIO Online Repository, a web based repository of audio and text resources;
6. DeREVERB - Blind speech enhancement and DeREVERBeration tool;
7. SENTIMENT - Sentence polarity predictor for SENTIMENT analysis;
8. TextPREDICT - Fast Text input PREDICTion on mobile devices.

The offer addressed to the economic environment

Research & development	Text to speech synthesis integrated in specific solutions for telecommunications, Automatic speech recognition and assistive technologies for human computer interface, Interactive Voice Response Systems, Online multimedia repositories using intelligent indexing and content searching.
Consulting	Multimedia technologies, data modelling, data mining, advanced methods for signal processing, eLearning solutions, project management, data security.
Training	Speech Processing, Statistical methods for data processing, Microprocessor-based systems.

ITEC – EMBEDDED GROUP

Contact details

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Acronym	ITEC - Embedded
Logo	
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Faculty Department	The Faculty of Electronics, Telecommunications and Information Technology Applied Electronics Department
Telephone	0264-401469
Fax	0264-594806
Director	Prof. Dr. Eng. Dan PITICA
e-mail	dan.pitica@ael.utcluj.ro



Areas of expertise

Embedded systems for Automotive

- **Circuit design:** modeling, simulation and cross-simulation of electronic circuits (analog, digital, power, RF/EMI) using: Multisim, Pspice, Matlab, Pcad;
- **System design:** modeling and simulation for electro-mechanical systems: power devices, actuators, mechatronics; using: Matlab, Simulink, LabVIEW;
- **HW Application design:** fast-prototype design, PCB design for mass production, BOM/AVL design, DfT and testability for embedded applications, power supplies, interface/signal conditioning boards;
- **SW Application design:** embedded control applications for OS and non-OS targets, broad range of targets (from small 8bit up to TriCore), V-model development for SW, SW re-use;
- **TW Application design:** testing and design of testing systems: SW and HW testing process, HiL and SiL, design of test-cases for SW;
- **Training services:** LabVIEW trainings, Embedded Systems trainings, TW and HiL operation;

Power systems

- design, simulation and testing of power supplies with power factor correction
- PLC (Power Line Communication) for energy measurements equipment
- inductive heating technologies

SCADA systems

- control for automotive systems
- heating/oven control
- control systems for electrical motors
- data loggers for power industrial control, medical apps

Certifications

LabVIEW Certified Developer, FMEA Specialist, Zuken Sch & PCB, Mentor Graphics PI & SI

Team

Prof. Dr. Eng. Dan Pitica, Prof. Dr. Eng. Ciascai Ioan, Assoc. Prof. Dr. Eng. Gabriel Chindriș; Prof. Dr. Eng. Ovidiu Pop, Assoc. Prof. Dr. Eng. Liviu Viman, Assoc. Prof. Dr. Eng. Septimiu Pop, Lect. Dr. Eng. Vlad Bande, Lect. Dr. Eng. Mihai Dărăban, Lect. Dr. Eng. Raul Fizeșan, Lect. Dr. Eng. Rajmond Jánó, Lect. Dr. Eng. Adrian Tăut, Lect. Dr. Eng. Ionel Baciuc, Assist. Dr. Eng. Alexandra Fodor, PhD student Eng. Marius Taut; PhD student Eng. Adelina Ilies; PhD student Eng. Elena Mirela Stetco, Eng. Aurelia Haragus;

Representative projects

“Test environment development for ECU/TCU software for Continental AG, Germany” – director Assoc. Prof. Gabriel Chindriș, PhD;
 “Development and maintenance of a SIL/HIL testing model for automotive ECU/TCU for Continental AG, Germany”

– director Assoc.Prof. Gabriel Chindriș, PhD;

“**Induction Cooking Project**”, research project no. 3/5.03.2008, Diehl-AKO Stiftung&Co.Kg Germany – director lect. eng Ovidiu Pop, PhD;

“**Stop/Start System for double clutch TCU**” - Continental AG, Germany – director Assoc.Prof. Gabriel Chindriș, PhD;

“**Embedded Data Logger for Heart Rate**” – Blatand GmbH, Germany - director Assoc.Prof. Gabriel Chindriș, PhD;

Significant results

The most representative publications of the past 5 years:

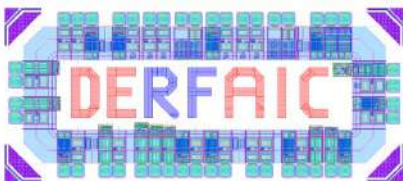
1. Alexandra Fodor, Gabriel Chindris, Rajmond Jano, and Dan Pitica, Thermal Modelling and Simulation Techniques for Multicore Processors, 42nd International Spring Seminar on Electronics Technology, ISSE 2019, Wroclaw, Poland, ISBN 978-83-7493-070-3
2. Marius Alexandru Taut, Gabriel Chindris, and Dan Pitica, Real-Time System with Integrated PID Algorithm used for DC Motor Control, 42nd International Spring Seminar on Electronics Technology, ISSE 2019, Wroclaw, Poland, ISBN 978-83-7493-070-3
3. Adelina Ioana Ilies, Ioan Ciascai, and Dan Pitică, Methods for Reusing Li-ion Cells from Discarded Battery Packs, 42nd International Spring Seminar on Electronics Technology, ISSE 2019, Wroclaw, Poland, ISBN 978-83-7493-070-3
4. Mihai Alexandru Ilie, Elena-Mirela Stetco, Liviu Viman and Dan Pitica, AC Coupled Instrumentation Amplifier with Gytrators, 42nd International Spring Seminar on Electronics Technology, ISSE 2019, Wroclaw, Poland, ISBN 978-83-7493-070-3
5. Adelina Ioana Ilies, Dan Pitica, Gabriel Chindris, Alexandra Fodor, Test Bench for Electrical and Performance Evaluation of Lithium-Ion Batteries, 2019 IEEE 25th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-7281-3330-0
6. V. Bande, S. S. Pop, Triaxial Vibrating – Wire Transducer Implementation and Measurements, 2019 IEEE 25th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-7281-3330-0
7. S. Pop, V. Bande, Digital Processing Method used to Improve the Frequency Measurement Accuracy for Vibrating-Wire Transducers, 2019 IEEE 25th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-7281-3330-0
8. M.A. Dăbâcan, L. Viman, and V. Bande, New Laboratory Concept Used with the Data Acquisition System Fundamentals Course, 2019 IEEE 25th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-7281-3330-0
9. R. G. Voinea, L. Viman and D. Pitica, Enhanced Stack-up for EMC, SI and PI in Mixed-Signal Systems, 2019 IEEE 25th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-7281-3330-0
10. M. A. Taut, G. Chindris, and D. Pitică, PID Algorithm used for DC Motor Control, 2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-5386-5577-1
11. I. M. Alexandru, A. Grama, L. Viman and D. Pitica, FFT Radix2 Core implemented on FPGA with DSP48 slices, 2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-5386-5577-1
12. R. Fizesan, and O. Pop, PI timing measurements in high speed flash memory embedded systems, 2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-5386-5577-1
13. Marius Alexandru Taut, Gabriel Chindris, Adrian Catalin Taut, and Dan Pitica, Model-in-the-Loop for Determining the Speed and Position of a DC Motor, 41st International Spring Seminar on Electronics Technology (ISSE), Zlatibor, Serbia, ISBN: 978-1-5386-5731-7, ISSN: 2161-2536
14. Adrian Taut, Gabriel Chindris, Mihai Daraban, Marius Taut, Resonant Power Converters used for Wireless Power Transfer, 41st International Spring Seminar on Electronics Technology (ISSE), Zlatibor, Serbia, ISBN: 978-1-5386-5731-7, ISSN: 2161-2536
15. Elena Mirela Stetco, Ovidiu Aurel Pop, Alin Grama, Doris Csipkes, Design, Modelling and Simulation of a Fifth Order Low-Pass Gm-C Filter, 2018 41st International Spring Seminar on Electronics Technology (ISSE), Zlatibor, Serbia, ISBN: 978-1-5386-5731-7, ISSN: 2161-2536, DOI: 10.1109/ISSE.2018.8443770, WOS:000449866600091
16. Elena-Mirela Stetco; Ovidiu Aurel Pop; Alin Grama; Doris Csipkes; Emilian Ceuca, Design and Simulation of a Sixth Order Band-Pass Gm-C Filter, 2018 IEEE 24th International Symposium for Design and Technology in Electronic Packaging (SIITME), ISBN: 978-1-5386-5577-1, DOI: 10.1109/SIITME.2018.8599271
17. Daraban, Mihai; Chindris, Gabriel; Taut, Adrian; et al., Uncertainty Budget for Hardware-In-the-Loop Test System 41st International Spring Seminar on Electronics Technology (ISSE) Location: Zlatibor, SERBIA Date: MAY 16-20, 2018, Book Series: International Spring Seminar on Electronics Technology ISSE Published: 2018

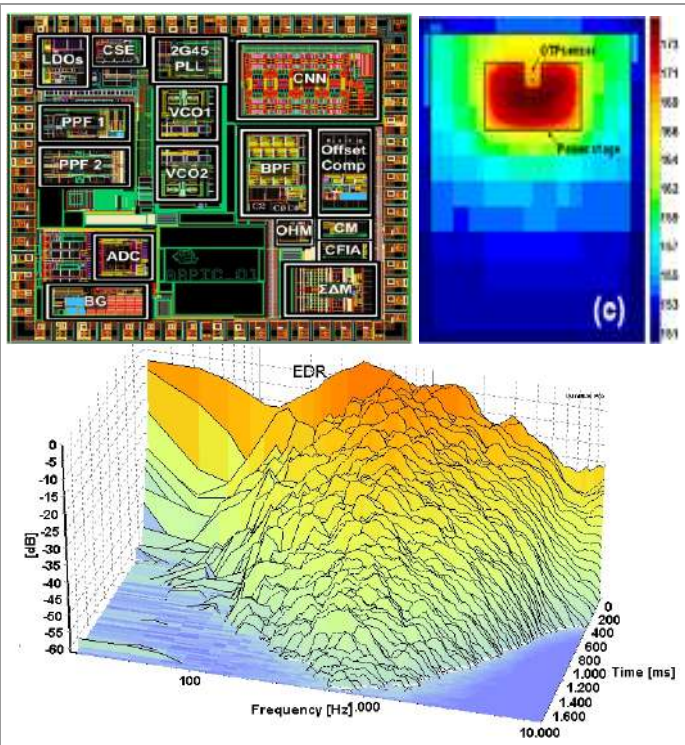
The offer addressed to the economic environment

Research & development	Calculus, design, simulation and analysis of power electronics circuits; Numerical methods of analysis; Control algorithms; Transducers physics; Electronic materials; Software, hardware and testware for embedded systems; Real-time measurements; Power electronics; Power dam SCADA systems; Applied electronics for white-goods;
Consulting	Electronics circuits and devices modeling and simulation; IP and patent analysis; Test equipment proof-of-concept; Design for technological transfer (DFx); EMI/EMC in PCB; PCB/PWB design; Software for embedded; Measurement, analysis and simulation for electronics; Real-time systems calibration; Design of electronics systems;
Training	LabVIEW training; Training for modeling and simulation; Training for embedded and real-time systems; Training for PCB design; Training for measurements, analysis and testing;

DIGITALLY ENHANCED ANALOG AND RF INTEGRATED CIRCUITS

Contact details

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Director	Prof. Dr. Marina Topa
e-mail	Marina.Topa@bel.utcluj.ro



Areas of expertise

Design of RF, Analog and Mixed-Signal Integrated Circuits

- Reconfigurable and programmable analog circuits; Analog Front-Ends for sensors
- High performance Power Management circuitry, including Energy harvesting and conversion
- Digitally-intensive frequency synthesizers and Low-power radio transceivers

Circuit and Signal Theory and Applications

- Systematic and optimized design of analog and digital circuits
- System modelling and analysis; Feedback theory & stability

Electronic circuits and systems for acoustics

- Optimized synthesis of acoustic equalizers; Analysis and improvement of the acoustic behaviour of enclosures

Methodologies for optimized design and testing of electronic circuits and systems

- Robustness optimization; Multivariate performance analysis for application verification. Yield analysis

Algorithms and techniques for compensating effects of non-idealities inherent to analog circuits & systems

- Compensation of IQ mismatch in integrated radio receivers; Reduction and compensation of DC offsets

Team

Prof. Dr. Marina Topa, Assoc. Prof. Dr. Marius Neag, Assoc. Prof. Dr. Botond-Sandor Kirei, Lecturer Dr. Ioana Sărăcuț, Lecturer Dr. Erwin Szopos, Lecturer Dr. Raul Onet, Assist. Prof. Dr. Călin Fărcaș, Dr. Ingrid Kovacs, Dr. Cosmin Sorin Pleșa, 10 PhD and Master students

Representative projects

Dezvoltare integrată 4.0, POC 72/1/2, Componenta 1: RO-ECSEL - Crearea de sinergie cu acțiunile de CDI ale programului cadru ORIZONT 2020 al Uniunii Europene și alte programe CDI internaționale (2020-2021)

Parteneriate pentru transfer de cunoștințe și tehnologie în vederea dezvoltării de circuite integrate specializate pentru creșterea eficienței energetice a noilor generații de vehicule, POC 2014, Ctr. 19/01.09.2016 (2016-2021)

NAPOSIP – “New Approaches to Analyzing and Designing High Frequency Sintetizers Performance for Modern Communication Systems”, PNIII 43 BG/2016 (2016-2018), <https://naposip.utcluj.ro/node/1>

“Analog Front-End for Automotive Sensors”, Consultancy Contract, 2015-2017

“New Methodologies for multivariate performance analysis”, Consultancy Contract, 2014-2016

“Digital compensation of I/Q mismatches in wide-band radio receivers”, POSDRU Postdoc Project, 2010-2013

“Frequency synthesizer for UWB transceiver tailored to location applications”, Consultancy Contract, 2013

“Design of analog blocks within the baseband of a radio transceiver for geological sensor, able to operate in harsh environments”, Consultancy Contract, 2010-2011

“New approaches in the design of multi-standard integrated radio receivers for digital radio and mobile TV: from system architecture to novel topologies and circuit solutions”, CNCSIS PCE-Idei, (2008-2011)

Significant results

Representative publications in the last 5 years:

1. P. Miresan, R. Onet, M. Neag, M.D. Topa, C. Chira – “Design options for implementing in standard CMOS drivers for MEMS body biasing”, *Microelectronics Journal*, vol. 97 (2020) 104705
2. Cosmin-Sorin Plesa, M. Neag, C. Boianeanu - “Design of Over-Temperature Protection for Switched-Capacitor DC-DC Converter Based on Electro-Thermal Simulations”, *Romanian Journal of Information Science and Technology*, Volume 22, Number 2, 2019, pages 144–157
3. C.S. Plesa, B. Dimitriu, M. Neag,– Design Options for Thermal Shutdown Circuitry with Hysteresis Width Independent on the Activation Temperature, *Advances in Electrical and Computer Engineering* Volume 19, No. 1, 2019, pp. 57-62
4. B.S.Kirei, V.I.M. Chereja, S.Hintea, M.D.Țopa, “PAELib: A VHDL Library for Area and Power Dissipation Estimation of CMOS Logic Circuits”, *Advances in Electrical and Computer Engineering*, Volume 19, Number 1, pp. 9-16, 2019
5. I. Kovacs, M. Neag - “New dual-loop topology for ring VCOs based on latched delay cells”, *Proceedings of 2018 IEEE International Symposium on Circuits and Systems (ISCAS 2018)*, Florenta, 27-30 May 2018, pp. 1-5
6. C.S. Plesa, M. Neag, L. Radoias – Design Options for Thermal Shutdown Circuitry with Hysteresis Width Independent on the Activation Temperature, *Advances in Electrical and Computer Engineering*, Vol. 17, Number 1, 2017, pp. 69-74
7. I. Kovacs, M.D.Țopa, A. Buzo, G.Pelz, “Integrated Circuits’ Characterization for Non-normal Data in Semiconductor QualityAnalysis”, *Proc. IEEE European Test Symposium (ETS)*, Lymasol, Cyprus, 22-26 May, 2017
8. C.-S. Plesa, M. Neag, C. Boianeanu and A. Negoita; – “Design methodology for over-temperature and over-current protection of an LDO voltage regulator by using electro-thermal simulations”, *Microelectronics Reliability*, Volume 79, December 2017, pages 509-516
9. E. Szopos, M. Neag, I. Sărăcuț, V. Popescu and M. D. Țopa, “Synthesis Tool Based on Genetic Algorithm for FIR Filters with User-Defined Magnitude Characteristics”, *Circuits, Systems and Signal Processing*, vol. 35, Issue 1, pp 253-279, January 2016, Springer, DOI: 10.1007/s00034-015-0054-0
10. C. Contan, B. S. Kirei and M. D. Topa, "Error-dependent step-size control of adaptive normalized least-mean-square filters used for nonlinear acoustic echo cancellation", *Signal Image and Video Processing*, vol. 10, pp. 511-518, 2016
11. M. Neag, R. Onet, I. Kovacs, P. Martari, „Comparative Analysis of Simulation-Based Methods for Deriving the Phase-and Gain- Margins of Feedback Circuits with OpAmps”, *IEEE Transactions on Circuits and Systems I - Regular Papers*, vol 62, issue 3, March 2015, pp. 625-634, DOI: 10.1109/TCSI.2014.2370151
12. R. Onet, M. Neag, I. Kovacs, M.D. Topa, S. Rodriguez, A. Rusu, "Compact Variable Gain Amplifier for a Multistandard WLAN/WiMAX/LTE Receiver", in *IEEE Trans. Circuits and Systems I*: vol. 61, no.1, 2014, pp. 247-257

Patents:

D. Petreus, M. Neag, B. Morley – Improved MPPT control for PWM-based DC-DC converters with average current control, Republic of Ireland, 2010, IES20100461 (A2), WO2012010613 (A1)
M. Neag, M. McCullagh, G. Marow, M. McLaughlin, I. Kovács - Frequency Comparator and Early-Late Detector, US patent 2015, US20160191035

Product realized for industrial beneficiaries:

1. Low dropout voltage regulators with fast response to load transients: 3 test-chips designed and integrated in a custom CMOS technology for Infineon Technologies Romania
2. Low power Switched-Capacitor DC-DC Converter for automotive applications: integrated circuit (IC) designed and implemented in a custom CMOS technology for Infineon Technologies Romania
3. High-Voltage LDO for automotive applications: IC designed for Infineon Technologies Romania, in mass production
4. Analog Front-End for automotive sensors - Integrated circuit designed in a 0.18um CMOS technology, produced as a test-chip for Melexis Technologies NV, Belgium
5. Frequency synthesizer integrated within an UWB transceiver produced in 90nm technology, for Anacores Ltd., Castlebar, Republic of Ireland
6. Integrated transceiver for geological explorations – chip mass produced in a CMOS 0.35um technology, for Silansys Semiconductor Ltd., din Dublin, Republic of Ireland, currently used in industrial exploration of oil deposits
7. Smart solar charger for Li-Ion batteries and supercapacitors, with a novel analog-digital MPPT algorithm – demo board realized for Anacores Ltd., Castlebar, Republic of Ireland

The offer addressed to the economic environment

Research & development	Development of adaptive filter theory, with applications in the processing of non-stationary signals by non-linear systems Extensions of the classical feedback theory, with applications in the stability analysis Analysis and design of electronic systems and circuits using advanced modelling and optimization methods Adaptive filters for signal processing and system analysis, with applications in acoustics Electronic systems and circuits for harvesting power from un-conventional energy sources
Consulting	Analysis and design of analog, RF and mixed-signal integrated circuits Analysis and design of digital systems, including FPGA and/or ASIC implementation Top-level verification of digital systems using SystemVerilog and SystemC Analysis and design of electro-acoustic systems – echo cancellation, reverberation control, signal separation, equalization etc.
Training	Design of analog, RF and mixed-signal integrated circuits using the industry-standard software package Virtuoso – Cadence: Schematic Editor, ADE, Layout Editor, Assura

SIGNAL PROCESSING GROUP

Contact details

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Acronym	SPG
Logo	
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Faculty Department	Faculty of Electronics, Telecommunications and Information Technology Bases of Electronics Department
Telephone	+40 264 401804
Fax	+40 264 592055
Director	Prof. Dr. Eng. Corneliu Rusu
e-mail	Corneliu.Rusu@bel.utcluj.ro



RTSP 2015

<https://sp.utcluj.ro/RTSP2015/HomeRTSP2015.htm>


RTSP 2017

<https://sp.utcluj.ro/RTSP2017/HomeRTSP2017.htm>

Areas of expertise

Adaptive filters for data echo cancellation – A family of stochastic gradient algorithms and their behaviour in the data echo cancellation work platform have been studied. The cost function adaptation algorithms use an error exponent update strategy based on an absolute error mapping, which is updating at every step. Performances similar to standard variable step-size methods have been obtained.

Signal reconstruction and phase retrieval – The phase retrieval problem is to reconstruct a signal given the modulus of its Fourier transform. This problem is associated with various applications including antenna design, filter design, image reconstruction. Recent research results relate phase retrieval to properties of zero-phase sequences or trigonometric polynomials.

Extracting a digital elevation model from a colour-coded relief scanned map – The focus of the project is in extracting a digital elevation model (DEM) from a colour-coded relief scanned map. The map is pre-processed in order to remove the dithering effect that appears during the printing process. For the pre-processing we propose a WHMM based algorithm, which preserves better the thin edges than the vector median filtering.

Exploration of singing voice individuality – The human voice is the result of a complex biological mechanism. It carries out information about our thoughts, feelings, and state of health. This great amount of information of different types can be extracted and interpreted. A new research domain is the acoustic configuration of the vocal sounds in singing. The singing voice analysis is useful for training singers in a professional manner.

Audio based solutions for detecting intruders in wild areas – The motivation of such an application is related to protection of large wildlife regions, such as forests, lakes, and other natural reservations. The sounds of interest are represented by humans, engines, birds and animals. In order to simulate various environmental situations, different types of noisy environments have been considered. Both low complexity and standard audio classification methods are delivered. Standard audio classification methods prove to be more robust, but at an expense of significantly increased complexity. Since low complexity systems are more feasible for monitoring remote areas, the complexity issue is analyzed and solutions are proposed.

Team

Prof. Dr. Eng. Corneliu RUSU, Assoc. Prof. Dr. Eng. Lăcrimioara GRAMA, Dr. Eng. Alexandru LODIN
Phd. students: Anamaria ICHIM, Andrei CIUPARU, Harald BĂRZAN

Representative

projects

SASID – “Smart Acoustic Sensor for Intruder Detection”, PN-III-P2-2.1-PED-2016-1608, (2017-2018), <https://sp.utcluj.ro/SASID2017/HomePage.html>

ROXAC – “Improving contextual awareness of a robot through the analysis of acoustic information”, PN-III-P2-2.1-BG-2016-0378, <https://sp.utcluj.ro/ROXAC2016/HomePage.html>

PAV3M – “Intelligent management system, monitoring and maintenance of pavements and roads using modern imagistic techniques”, PCCA (2014-2016), <http://193.231.19.17/PAV3M/>

RTSP 2015, “International Workshop on Recent Trends on Signal Processing”
<http://sp.utcluj.ro/RTSP2015/HomeRTSP2015.html> (2015)

SpeD, “The 7th International Conference on Speech Technology and Human-Computer Dialogue”,
<http://www.sped2013.ro/> (2013)

SPAMEC, “Signal Processing and Applied Mathematics for Electronics and Communication”, ANCS,
<http://sp.utcluj.ro/SPAMEC/HomeSPAMEC2011.html> (2012)

SPSWC, “Signal Processing Systems for Wireless Communications”, CNCSIS,
<http://sp.utcluj.ro/SPSWC/HomeSPSWC2008.html> (2008)

“Adaptive Reconstruction of Signals for Compressive Sampling of Acoustic Sensors Arrays”, PN-ID,
http://sp.utcluj.ro/PN_ID_162_2008/HomePage.html (2008)

Significant results

The most representative publications of the past 5 years:

1. L. Grama, C. Rusu, "Extending Assisted Audio Capabilities of TIAGo Service Robot," International Conference on Speech Technology and Human Computer Dialog (SpeD 2019), 10-12 Oct. 2019, Timisoara, Romania, pp. 1-8, DOI: 10.1109/SPED.2019.8906635
2. A. Lodin, L. Grama, C. Rusu, "Python Implementation of the State-Space Method to Convert Analog Filters Described by a Netlist to Digital Filters," 6th International Symposium on Electrical and Electronics Engineering (ISEEE 2019), 18-20 Oct. 2019, Galati, Romania
3. C. Popescu, L. Grama, C. Rusu, "Automatic Text Summarization by Mean-absolute Constrained Convex Optimization," 41st International Conference on Telecommunications and Signal Processing (TSP 2018), pp. 706-709, July 4-6, 2018, Athens, Greece, DOI: 10.1109/TSP.2018.8441416, WOS: 000454845100158
4. L. Grama, C. Rusu, "Adding audio capabilities to TIAGo service robot," 13th International Symposium on Electronics and Telecommunications (ISETC 2018), pp. 263-266, November 8-9, 2018, Timișoara, Romania, DOI: 10.1109/ISETC.2018.8583897, WOS: 000463031500059
5. A. Lodin, L. Grama, C. Rusu, "From bulky analog active filters to digital filters," 13th International Symposium on Electronics and Telecommunications (ISETC 2018), pp. 271-274, November 8-9, 2018, Timișoara, Romania, DOI: 10.1109/ISETC.2018.8583912, WOS: 000463031500061
6. L. Grama, C. Rusu, "Choosing an Accurate number of Mel Frequency Cepstral Coefficients for Audio Classification Purpose," 10th International Symposium on Image and Signal Processing and Analysis (ISPA 2017), pp. 225-230, Sept. 18-20, 2017, Ljubljana, Slovenia, DOI: 10.1109/ISPA.2017.8073600, WOS: 000442428600042
7. C. Rusu, L. Grama, "Recent Developments in Acoustical Signal Classification for Monitoring," (invited paper) 5th International Symposium on Electrical and Electronics Engineering (ISEEE 2017), pp. 1-10, Oct. 20-22, 2017, Galati, Romania, DOI: 10.1109/ISEEE.2017.8170705; WOS: 000428234400081
8. E. Buhus, L. Grama, C. Serbu, "A Facial Recognition Application Based on Incremental Supervised Learning," 13th International Conference on Intelligent Computer Communication and Processing (ICCP 2017), pp. 279-286, Sept. 7-9, 2017, Cluj-Napoca, Romania, DOI: 10.1109/ICCP.2017.8117017; WOS: 000417426600034
9. L. Grama, C. Rusu, "Audio signal classification using Linear Predictive Coding and Random Forests," International Conference on Speech Technology and Human-Computer Dialogue (SpeD 2017), pp. 1-9, July 6-9, 2017, Bucharest, Romania, DOI: 10.1109/SPED.2017.7990431; WOS: 000425849600006
10. L. Grama, L. Tuns, C. Rusu, "On the Optimization of SVM Kernel Parameters for Improving Audio Classification Accuracy," 14th International Conference on Engineering of Modern Electric Systems (EMES 2017), pp. 224-227, June 1-2, 2017, Oradea, Romania, DOI: 10.1109/EMES.2017.7980420, WOS: 000427085200053

See http://www.sp.utcluj.ro/SPGroup/SPG_Pub_Database.html for SPG publications.

The offer addressed to the economic environment

Research & development	Signal Processing Group makes research - in the core areas: signal reconstruction, adaptive filtering, compressive sampling, acoustic sensors, processing of signals obtained from specific sensors or from medical devices. - in the applied fields: sensor arrays, image processing, security and protection, intruder detection and forensics.
Consulting	Signal Processing Group provides consulting in the areas of digital signal and image processing, digital filtering, optical signal processing, computer analysis and synthesis of circuits, algorithms for signal processing, numerical methods, medical electronics, sensors and devices, wireless networks.
Training	Digital signal processing, digital filter design, adaptive filtering, signal modeling, mathematical methods for signal processing, applied statistics, optical processing and storage of information, Fourier optics.

INTEGRATED CIRCUITS AND SYSTEMS GROUP

Contact details

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Director	Prof. Dr. Eng. Sorin Hintea
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Areas of expertise

Design of mixed analog/digital circuits for telecommunication systems

The study and the development of some analog adaptive circuits, aimed for the practical realization of the “software defined radio” concept. The emphasis was the development of some reconfigurable filter architectures with programmable parameters, and their digital control with evolutionary methods.

Design of low-power programmable analog/mixed-signal circuits for biomedical applications

The development of some analog programmable circuits, aiming for bio-potential monitoring, bio-sensing and electro-stimulation of the human tissue. The emphasis was signal acquisition (amplification and artefact removal), signal processing (determination of the ECG or EMG morphology) and correlation of the physiological measurements.

Application of computational intelligence / deep learning techniques

Development and implementations of applications based of computational intelligence / deep learning techniques: analysis and design of some analog circuits; modelling (function fitting, pattern recognition, prediction); control applications; deep neural network implemented in Python.

Optoelectronics and photonics with optical communications

Applications with optical distributed sensors; Modelling and simulation of the special optical fibres (LMA, rare earth doped fibres); applications with optical biosensors based on plasmonic effect and fluorescence; optical integrated circuits modelling and simulation; photonic point-of care platforms with VR/AR capabilities; wearable devices based on embedded systems.

Advanced design techniques of analog and digital integrated circuits

The design of complex electronic circuit structures under the Mentor Graphics and Cadence design environment: reconfigurable circuits with applications in auditory prosthesis, transmission of the biomedical parameters over an electromagnetic link, radiofrequency receptors, low-power integrated circuits.

Team

Prof. Dr. Eng. Sorin Hintea, Prof. Dr. Eng. Gabriel Oltean, Assoc. Prof. Dr. Eng. Ramona Galatus, Assist Prof. Dr. Eng. Gabor Csipkes, Assist Prof. Dr. Eng. Paul Farago, Assist Prof Eng. Lorant Szolga, Asist prof Emilia Sipos, Asist prof Laura Ivanciu, Assoc. Prof. Dr. Doris Csipkes, Asist prof Robert Groza, Asist prof Albert Fazakas, Assoc. Prof. Dr. Eng. Mihaela Cirlugea, Teacher Assistant, PhD student Adriana Potarniche

Representative projects

ERANET-„ Innovative Technological Approaches for validation of Salivary AGEs as novel biomarkers in evaluation of risk factors in diet-related diseases”, UMF Cluj, <https://salivages.wordpress.com/team/> (2018-2021)
DAM-FU – “Intelligent hydro-dams behavior monitoring system through information fusion”, PN-III-CERC-CO-PTE-2016, 2016-2018.

nSensOFWater – “Nano-Enabled Optical Fiber Biosensor Device with Smartphone Interface for Fast and Selective Detection of Antibiotics in Water”, PN-III-P2-2.1-PED-2016-0172, (2017-2018),

<http://www.bel.utcluj.ro/~galatusr/PED67UEFISCDI.html>

“Design of a portable biomedical monitoring system with intelligent parameter control”, CICDI-2017, 2000/12.07.2017 (2017-2018)

StableNextSo – “Stable Next-Generation Photovoltaics: Unraveling degradation mechanisms of Organic Solar Cells by complementary characterization techniques” FP7-COST MP1307 (I), (2014-2018) link:

<https://www.cost.eu/actions/MP1307>

PARTING -“Design of some integrated circuits for biomedical applications using evolutionary computation techniques” POSDRU/159/1.5/S/137516 „Parteneriat interuniversitar pentru excelenta in inginerie - PARTING”

“Design of analog reconfigurable circuits using evolutionary algorithms for fourth generation mobile communication terminals” (IDEI 657/2009-2011)

INTEREVISS – “Serviciu interactiv, in timp real pentru cresterea sigurantei publice in aglomerari urbane”, PN-II-PT-PCCA-2013-4, 2014 (2014-2016).

“European Network for High Performance Integrated Microwave Photonics”, HORIZON2020-COST-CA16220 (4 Oct 2017-3 Oct 2021), Link: <https://www.cost.eu/actions/CA16220>

“Advanced Fibre Laser and Coherent Source as tools for Society, Manufacturing and Lifescience”, (10 Dec 2014-9 Dec 2018), HORIZON2020- COST-MP 1401 Link: <https://www.cost.eu/actions/MP1401> ,

“Innovative methods in radiotherapy and radiosurgery using synchrotron radiation”, HORIZON 2020-COST-TD1205- (21 May 2013-20 May 2017), Link: <https://www.cost.eu/actions/TD1205/>

Significant results

The most representative publications of the past 5 years (2019-2015):

1. **Farago, P., Galatus, R., Hintea, et al**, An Intra-Oral Optical Sensor for the Real-Time Identification and Assessment of Wine Intake, SENSORS, Volume: 19 Issue: 21, Article Number: 4719, DOI: 10.3390/s19214719, NOV 2019
2. **R. Galatus, P. Farago, et al**, Distributed fluorescent optical fiber proximity sensor Towards a proof of concept, Spectrochimica Acta Part A-Molecular and Biomolecular Spectroscopy, vol. 198, pp. 7-18, 2018, ISSN: 1386-1425.
3. **P. Farago, R. Groza, S. Hintea**, High precision activity tracker based on the correlation of accelerometer and EMG data. 2019 42ND TSP Conference, JUL 01-03, 2019, Budapest, Hungary, pp. 428-431, ISBN:978-1-7281-1864-2
4. **P. Farago, R. Groza, L. Ivanciu, S. Hintea**, A Correlation-based Biometric Identification Technique for ECG, PPG and EMG. 2019 42ND TSP Conference, JUL 01-03, 2019, Budapest, Hungary, pp.716-719, ISBN:978-1-7281-1864-2
5. **Gabriel Oltean**, Victor Oltean, Horea Alin Balea, Method for Rapid Development of Arduino-based Applications Enclosing ANN, 45th Annual Conference of the IEEE Industrial Electronics Society, IEEE, Lisbon, Portugal, 14-17 Oct, 2019;
6. **Gabriel Oltean**, Camelia Florea, Radu Orghidan, Victor Oltean, Towards Real Time Vehicle Counting using YOLO-Tiny and Fast Motion Estimation , 25th International Symposium SIITME, IEEE, Cluj-Napoca, Romania, 23-26 October, 2019;
7. **Oltean, G, Ivanciu, Laura**, Implementation of a Fuzzy Logic-Based Embedded System for Temperature Control, IEEE 40th International ISSE2017, DOI: 10.1109/ISSE.2017.8001006, 10-14 May, Sofia, Bulgaria, 2017
8. **Oltean, G, Ivanciu, Laura**, Gordan, Mihaela, Stoian, I., Kovacs, I., Predictive model for the horizontal displacement of a dam using autoregressive neural network, IEEE 21st International Conference INES 2017, Larnaca, Cipru, 20-23 octombrie, Electronic ISBN: 978-1-4799-7678-2 2017, 2017;
9. **Blidar, A., Feier, B., Tertis, M., Galatus, R., Cristea, C.**, Electrochemical surface plasmon resonance (EC-SPR) aptasensor for ampicillin detection, Anal Bioanal Chem (2019) 411: 1053. Doi: 10.1007/s00216-018-1533-5 (Impact factor= 3.28)
10. **N Cennamo, F. Mattiello, R. Galatus, et al**, Plasmonic sensing in D-shaped POFs with Fluorescent optical fibers as light sources, IEEE Transactions on Instrumentation & Measurement, Issue 4, April 2018, pp 754 - 759
11. **C Cristea, M Tertis, R. Galatus** -"Magnetic Nanoparticles for Antibiotics Detection, Nanomaterials 2017, 7(6), 119;
12. **Cecilia Cristea, Florin Graur, R. Galatus, et al**, Nanobiomaterials for Cancer Diagnosis and Therapy, INTERNATIONAL BOOKS- CHAPTER in "Nanobiomaterials: Applications in Drug Delivery, CRC Press, 2017
13. **Szolga, L. A.; Galatus, R.; Oltean, G.; et al.**, Intrusion Detection System Based on Plastic Optical Fiber 2017 IEEE 23RD INTERNATIONAL SYMPOSIUM SIITME Pages: 403-408 Published: 2017

Diploma of Excellence and Medal Inventica 2019 - **Faragó Paul, Gălătuș Ramona-Voichița, Groza Robert-Gheorghe**, The XXIII International Exhibition of inventics „Inventica 2019”, 26-28 June 2019, Iași, Romania.

Diploma and Silver Medal - **Faragó Paul, Gălătuș Ramona-Voichița, Groza Robert-Gheorghe**, Salonul Internațional de Invenții și Inovații "TRAIAN VUIA" Timișoara, 12-14 iunie, 2019, Romania.

The offer addressed to the economic environment

Research & development	Analog, digital and mixed-signal VLSI integrated circuit design methods; Analysis, synthesis and design techniques for current-mode analog VLSI circuits; Evolutionary techniques used in the synthesis of VLSI electronic circuits; Application development with HDL languages (Verilog, VHDL); Design and implementation of digital systems with FPGAs; Application of computational intelligence / deep learning techniques; Synthesis of some analog digital and mixed signal integrated circuits up to mask layer, using the Mentor Graphics and Cadence VLSI design environment;
Consulting	Analog, digital and mixed-signal design, non-conventional design techniques: neural networks, deep neural networks, fuzzy systems, genetic algorithms; optical sensors and optoelectronic systems; electronic and optoelectronic systems for biomedical applications
Training	The Integrated Circuits and Systems Group offers instruction/training in the following domains: computer aided design of analog and digital circuits; computational intelligence / deep learning techniques; photonic sensors and biosensors, optoelectronic systems; electronic systems for medical applications.

RENEWABLE ENERGIES GROUP

Contact details

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Areas of expertise

Renewable Energy

- Develop new ways to improve energy harvesting and storing for microgrids.

Switched Mode Power Supplies(SMPS) and Power Electronics

- Study and develop new topologies in the field of SMPS.

Digital Control

- Study and develop new non-linear algorithms that can be used in the field of power supplies/grid tied inverters.

System Modelling and Simulations

- Develop macro-models for the switched mode power converters in order to improve simulation times.

Embedded Systems

- Develop systems with microcontrollers in C/C++ and assembly for different types of applications: low cost, time constrained, wireless, industrial and sensing.

Team

Prof. Dr. Eng. Dorin Petreus, Assoc. Prof. Dr. Eng. Niculaie Palaghiță, Assoc. Prof. Dr. Eng. Cristian Fărcaș, Lecturer Dr. Eng. Toma Pătrău, Lecturer Dr. Eng. Radu Etz, Lecturer Dr. Eng. Ionuț Ciocan, Assist. Dr. Eng. Lazar Eniko, Dr. Eng. Dan Filip, Eng. Andreea Ignat, Eng. Radu Joian, Eng. Izsak Ferencz, Eng. Gherman Tudor, Eng. Petri Anamaria, Eng. Ciascai Alexandru.

Representative projects

MVDC-ERS - "Flexible medium voltage DC electric railway systems", H2020-S2RJU-OC-2018, (2018-2021)
MICROINV - "Microinverters with high power density and high efficiency for renewable energies" POC-A1-A1.2.3-G-2-15.
REMSIS, "Renewable energy management system used for small isolated communities", <http://remsis.utcluj.ro/>, (2013-2016)
MICROCCP, "Miniaturized Equipment with Capacitively Coupled Plasma Microtorch and Analytical Technologies for Simultaneous Elemental Determination used in Environment and Foods control", <http://www.chem.ubbcluj.ro/~edarvasi/Proiect/index.html> (2012-2015)
INNOWECS, "Innovative wind energy conversion micro-system with direct-driven electric generator for residential uses", <http://innowecs.utcluj.ro/> (2012-2015)
ATM32, "Four cells galvanic bath", PNII-IN-CI, (2014)
ATM41, "Medical equipment for magnetic therapy with low frequency pulsed magnetic field", 20CI-PN2-IN-CI, (2012)
"Intelligent System for Battery Charging Based on Optimized Algorithms for Maximum Power Tracking in Solar Installations", <http://solar.utcluj.ro/rezultate-en.html> (2007-2009)

FLUOROSPEC, “Optoelectronic Equipment and Innovative Method of High Precision and Sensitivity Based on Non-conventional Fluorescence Spectrometry for Testing and Control of Some Environmental Agents”, PNCDII, (2008-2010) TRANS-SUPERCAP, “Energy Optimized Electrical Systems for Land Transport using Batteries and Supercapacitors”, PNII-P4, (2007-2009)

Significant results

The most representative publications of the past 5 years:

1. Petreus, D.; Etz, R.; Patarau, T.; et al., An islanded microgrid energy management controller validated by using hardware-in-the-loop emulators INTERNATIONAL JOURNAL OF ELECTRICAL POWER & ENERGY SYSTEMS Volume: 106 Pages: 346-357 Published: MAR 2019
2. Lazar, Eniko; Petreus, Dorin; Etz, Radu; et al., Software Solution for a Renewable Energy Microgrid Emulator ADVANCES IN ELECTRICAL AND COMPUTER ENGINEERING Volume: 18 Issue: 1 Pages: 89-94 Published: 2018
3. Unguresan, Paula V.; Porumb, Raluca A.; Petreus, Dorin; et al., Orientation of Facades for Active Solar Energy Applications in Different Climatic Conditions JOURNAL OF ENERGY ENGINEERING Volume: 143 Issue: 6 Article Number: 04017059 Published: DEC 2017
4. Neamtu, Marius Ovidiu; Balan, Mugur; Petreus, Dorin; et al., CONSIDERATIONS ON A GEOTHERMAL ELECTRIC POWER GENERATOR BASED ON ORGANIC RANKINE CYCLE AS A PART OF A SMART-GRID REVUE ROUMAINE DES SCIENCES TECHNIQUES-SERIE ELECTROTECHNIQUE ET ENERGETIQUE Volume: 62 Issue: 4 Pages: 431-435 Published: OCT-DEC 2017
5. D. Petreus, S. Daraban, M. Cirstea, “Modular Hybrid Energy Concept Employing a Novel Control Structure Based on a Simple Analog System”, *Advances in Electrical and Computer Engineering*, Vol. 16, No. 2, pp. 3-10, 2016 DOI:10.4316/AECE.2016.02001.
6. Petreus Dorin, Patarau Toma, Etz Radu, Lazar Eniko, “Supplying a Renewable Energy Single Phase Microgrid from a Biomass Generator Using a Three Phase Induction Machine”, *10th International Conference on Compatibility, Power Electronics and Power Engineering CPE-POWERENG2016*, Bydgoszcz, Polonia, 29.06.2016 – 01.07.2016, pp. 208-213. DOI: 10.1109/CPE.2016.7544186.
7. Etz, R., Petreus, D., Frentiu, T., Patarau, T., Orian, C. “An Indirect Method and Equipment for Temperature Monitoring and Control”, *Advances in electrical and computer engineering*. AECE, Issue 4, 2015.
8. Dorin Petreus, Radu Etz, Toma Patarau, Cristian Orian, “Microgrid concept based on distributed renewable generators for a greenhouse”, *Acta Technica Napocensis*, vol. 56, no. 2 2015, pp. 31-36.

Significant solutions:

Power supplies with power factor correction, grid tied inverters, UPS, low/high power battery chargers from photovoltaic panels, maximum power point tracking algorithms, power optimizers for improving energy harvesting, bidirectional converters, battery equalizers, digital control applied in switched mode power supplies (DSPs, FPGA), class E amplifier for plasma generator, hybrid storage system using supercapacitors and battery packs, battery inverters, low power induction generators, energy management algorithms used in renewable energy microgrids, algorithms for sizing microgrids with renewable energies.

Products and technologies:

1. Design and implementation of switched mode power supplies/inverters; 2. Embedded programming for DSPs (dsPIC and TMS328F28/F24) and microcontrollers (Microchip, TI, Atmega, 8051) with industrial applications; 3. Design and implementation of systems for energy harvesting (photovoltaics, wind energy, geothermal and biomass); 4. Power optimizers (Distributed maximum power point tracking systems)/microinverters for energy harvesting; 5. Design and implementation of battery/supercapacitor chargers; 6. Implementation of analog/digital control; 7. Implementation of electronic systems to be used for chemical/medical experiments (plasma generator, magneto therapy, electrotherapy).

Patents: International

D. Petreus, M. Neag, B. Morley – “Improved MPPT-Control for PWM-based DC-DC converters with average current control”, international no. WO 2012/010613 A1, January 26, 2012.

Patents: National

1. BIPOLAR CURRENT PULSE AMPLIFIER IN HYBRID BRIDGE WITH SYMMETRICAL CONTROL, Patent(s) no. RO128681-A2; RO128681-B1, 2018
2. Low power plasma generator at low atmospheric pressure - OSIM Bucharest: Patent no. 128077/2016
3. Medical equipment for magnetic therapy with low frequency pulsed magnetic field: OSIM Bucharest: A/10009/2010/ 13 July 2010 (pending);
4. Electrostimulator with digital control for hydrotherapy: OSIM Bucharest: A/00372 , 19.05.2014 (pending)
5. Method and electronic temperature control device for a metallic filament through indirect measurement: OSIM Bucharest: A/00732/2014, 02.10.2014 (pending)

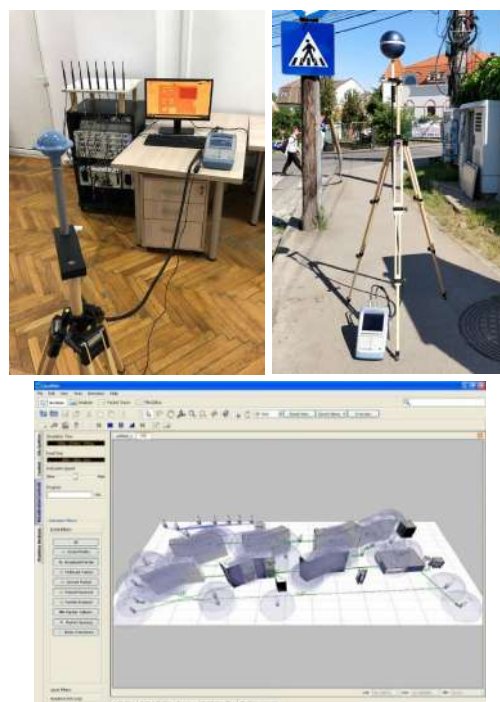
The offer addressed to the economic environment

Research & development	Supporting local industry to be more competitively on the market by using applied research.
Consulting	Consultancy and applied research for the industrial or academic environment, according to the skills of the laboratory members: high efficient power supplies, digital control, embedded programming, system modeling and simulation and renewable energy.
Training	Specialized courses according to the skills of the laboratory members: high efficient power supplies, digital control, embedded programming, system modeling and simulation and renewable energy.

CELLULAR AND WIRELESS COMMUNICATIONS RESEARCH LABORATORY

Contact details

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Areas of expertise

Radio network performance, implementation and related services for fixed, mobile and satellite systems:

- radio network planning (satellite, cellular, local, and sensors) and behavior analysis (QoS and QoE) using professional tools (QualNet, EXata, ICS Telecom EV/HTZ communications);

Electromagnetic waves propagation and radio channel characterization:

- radio channel modelling (Matlab), smart antenna arrays / MIMO systems (direction finding and beamforming), RF and microwave propagation, EM field modelling and simulation (AWR Microwave Office); ionospheric propagation monitoring;

Environmental monitoring

- evaluation of electromagnetic pollution; sensor networks for pollution monitoring;

Industrial IoT

- sensor networks for IIoT (redundancy, dual-standard, energy efficiency), modelling and analysis of IIoT sensor networks

Team

Prof. Tudor Palade, Assoc. Prof. Emanuel Puschita, Assist. Prof. Andra Pastrav, Assist. Prof. Paul Dolea, Assist. Cristian Codau

Representative projects

IntraSAT-Tech, Centre of competence for wireless Intra-SATellite Technologies, STAR 115/2016, ROSA, 2016-2019.

RDAntenna, Compact retro-directive wireless antenna network for wireless systems in IEEE 802.11 and IEEE 802.11 communication protocols, 6 SOL/2017 within PNCDI III, 2017-2020.

SIRIUS, Ionospheric propagation predictions and wide-band communications with SDR sensors in the HF range for emergency informational support in Romania, PCCA, 2014 - 2016.

SIM-SCP, Implementation of an integrated system for acquisition and transmission of monitoring data from hazardous substances in Cluj, RO04-0006, SEE Grant, 2015 – 2016.

WiSAT, Wireless Communication Bus for Satellite Applications, ESA (European Space Agency), 2014-2015.

SMANT, New Algorithms for adaptive/smart antennas in 3G and post-3G communication systems, PN2, 2007-2010.

RAMA, Experimental weak radio signals monitor for ionospheric disturbances analysis, STAR, 2012-2014.

PABMAR, Integrated wireless platform of local access for broadband and mobility based on self-organizing resources, PN2, 2007-2010.

COSMOS, S band mobile satellite communications platform, PN2, 2007-2010.

CERVIT, Virtual network IT&C for education and research units geographical spread, PN2, (2007-2010)

4WARD, Architecture and design for the future internet", FP7-ICT, (2007-2009)

BROADWAN, Broadband services for everyone over fixed wireless access networks, FPVI, (2003-2006)

1. **EMBRACE**, Efficient millimeter broadband radio access for convergence and evolution, PCV, (1999-2002)
2. **MARCH**, Multilink architecture for multiply services, Eureka Cluster Project, (2008-2011).

Significant results

The most representative publications of the past 5 years:

Books

1. Puschita, E., Pastrav, A., Semenciuc, E., Palade, T., Calitatea serviciilor în rețele de telecomunicații cu acces radio, ed. a 2-a, Cluj-Napoca, Editura U.T.Press, ISBN 978-606-737-189-5, 320 pagini, 2016

Book Chapters

1. Semenciuc, E., Pastrav, A., Palade, T., Puschita, E., "SDWN for End-to-End QoS Path Selection in a Wireless Network Ecosystem", Future Access Enablers for Ubiquitous and Intelligent Infrastructures, Lecture Notes of the Institute for Computer Sciences, Social Informatics and Telecommunications Engineering, Volumul 241, p. 134-140, Springer, 2018. (WOS:000481658200020, https://doi.org/10.1007/978-3-319-92213-3_20, https://link.springer.com/chapter/10.1007/978-3-319-92213-3_20)
2. Pastrav, A., Dolea, P., Puschita, E., Codau, C., Palade, T., Palade, I., "Exposure to UHF Electromagnetic Radiation in Urban Areas", 6th International Conference on Advancements of Medicine and Health Care through Technology, Volume 71, p. 97-101, Springer, 2018. (https://doi.org/10.1007/978-981-13-6207-1_16, https://link.springer.com/chapter/10.1007%2F978-981-13-6207-1_16)

Research Articles

1. I. Domuta and T. P. Palade, "On-line Estimation of Base Station Location," in IEEE Wireless Communications Letters. 2019 (jurnal ISI, IF=3.546, Q1) <https://doi.org/10.1109/LWC.2019.2953848>.
2. Puschita, E., Constantinescu, A., Colda, R., Vermesan, I., Moldovan, A., Palade, T. Challenges for a broadband service strategy in rural areas: A Romanian case study, Telecommunications Policy, ISSN: 0308-5961, d.o.i: 10.1016/j.telpol.2013.08.001, vol. 38, issue 2, martie 2014, pp. 147–156. WOS:000335875800003.
3. Pastrav, A., Puschita, E., Palade, T., "Ionospheric Propagation Monitoring and TEC Measurements Using GPStation-6 GNSS Receiver", 11th European Conference on Antennas and Propagation (EuCAP2017), 19-24 2017, Paris, Franța, pp. 3887-3891. WOS:000403827303152. <https://doi.org/10.23919/EuCAP.2017.7928814>
4. Ratiu, O., Rusu, A., Pastrav, A., Palade, T., Puschita, E., Implementation of an UWB-based Module Designed for Wireless Intra-Spacecraft Communications", Proceedings of 2016 IEEE International Conference on Wireless for Space and Extreme Environments (WiSEE 2016), ISBN: 978-1-5090-2609-8, IEEE Catalog Number: CFP1632U-ART, DOI: 10.1109/WiSEE.2016.7877320, ISBN: 978-1-5090-2609-8, Aachen, Germany, September 26–28, pp. 146-151, 2016. WOS:000405562000027
5. Semenciuc, E., Pastrav, E., Palade, T., Puschita, E., Performance Evaluation of a Cloud-based QoS Support Mechanism, IEEE 11th International Conference on Communications (COMM 2016), Bucharest, Romania, ISBN 978-1-4673-8196-3, doi: 10.1109/ICComm.2016.7528300, June 9-11, 2016, pp. 267- 270. WOS:000383221900051
6. Pastrav, A., Puschita, E., Palade, T., GPStation-6 Employment for GNSS TEC Monitoring in SIRIUS Project, IEEE Catalog Number: CFP1603L-CDR, ISBN 978-1-5090-3748-4, 12th International Symposium on ELECTRONICS AND TELECOMMUNICATIONS (ISETC 2016), DOI: 10.1109/ISETC.2016.7781058, Timișoara, România, Oct 25-26, 2016. WOS:000383221900051

Significant solutions:

1. Optimized models for radio channel using MIMO mechanisms and cognitive radio approaches.
2. Profile and fuzzy-logic based QoS support for wireless access networks.
3. Network planning and performance evaluation of the QoS support (active and passive site survey for WLAN).
4. Wireless sensors network implementation in pollution monitoring systems and industrial IoT.

Products and technologies:

1. Network planning for various radio technologies: satellite links, broadcasting systems, fixed broadband radio links, mobile cellular networks, wireless systems for metropolitan, local and personal use.
2. Professional simulation tools for wireless networks (sensor, local, cellular and satellite) and electromagnetic field analysis in different propagation environments.
3. Evaluation of electromagnetic pollution in urban areas.
4. Wireless sensors networks design, deployment, calibration and maintenance following standards and custom requirements.

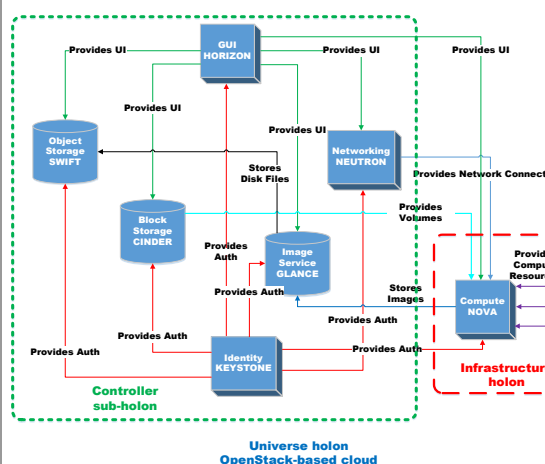
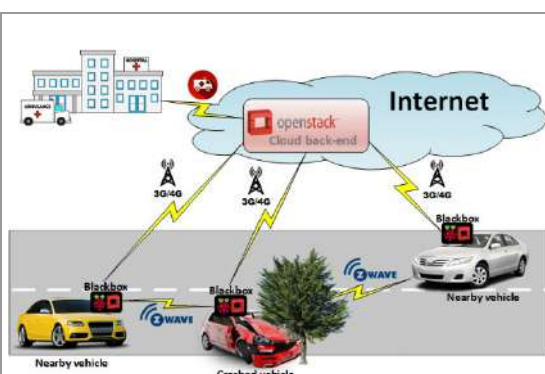
The offer addressed to the economic environment

Research & development	Terrestrial and satellite radio channel analysis and modelling. Terrestrial and satellite network architecture optimization. Heterogeneous network planning. Smart antenna arrays using SDR (direction finding, beamforming).
Consulting	Consulting on radio networks planning and optimization for efficient resource allocation, smart antenna design and positioning using adaptive beamforming and direction finding.
Training	SICAS Master (Integrated Communication Systems for Special Applications) including: Wireless systems, Interferences and electromagnetic compatibility, Satellite communications systems, Measurement of radio systems, Radio networks planning. http://master-sicas.utcluj.ro

UNIFIED COMMUNICATIONS IN CLOUD LABORATORIES

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Areas of expertise

Telecommunications Networks

Switching and routing; Computer Networks; Internet Protocols; Unified Communications in Cloud; Software-defined networking in local and metropolitan area, Network security, Cyber-Security; IoT Security; Quality of Service in Next-Generation Networks.

Team

Prof. Virgil Dobrota, Ph.D.; Assoc. Prof. Daniel Zinca, Ph.D.; Assist. Prof. Tudor Blaga, Ph.D., Assist. Prof. Andrei Bogdan Rus, Ph.D., Assist. Prof. Iustin-Alexandru Ivanciu, Ph.D.; Eng. Gabriel Lazar, Ph.D. student, Eng. Calin-Marian Iurian, Ph.D. student; Eng. Claudiu Iakkel, Ph.D. student; Romeo Andreica, Ph.D. student; Eng. Robert Botez

Representative projects

URBIVEL "Advanced Technologies for Intelligent Urban Electric Vehicles", ID P_40_333 project, POC-A1-A1.2.3, <https://urbivel.utcluj.ro/> (2016-2020)
DIONASYS "Declarative and Interoperable Overlay Networks, Applications to Systems of Systems", CHIST-ERA project, <https://www.dionasys.eu/> (2015-2018)
UCONNECT "Implementation of Ubiquitous Connectivity for Public Transport", FP7-SME-2012-1/315161 project, <https://cordis.europa.eu/project/rcn/105670/factsheet/en> (2012-2014)
4WARD "Architecture and Design for the Future Internet", FP7-ICT-2007-1 No. 216041 project, <https://cordis.europa.eu/project/rcn/85316/factsheet/en> (2008-2010)
Wi-QoS "Traffic and QoS Management in Wireless Multimedia Networks", COST 290 project, <https://www.cost.eu/actions/290> (2004-2008)

Significant results

The most representative publications of the past 5 years:

1. R. Onet, I.A. Ivanciu, R. Burian, D. Zinca, C.M. Campeanu, and V. Dobrota, "Automatic Deployment of a Network Overlay in an Intelligent Transportation System: Docker and Open Baton Approach", Proceedings of the 18th RoEduNet Conference: Networking in Education and Research, "Dunarea de Jos" University of Galati, Romania, 10-12 October 2019, DOI: 10.1109/ROEDUNET.2019.8909588.
2. I.A. Ivanciu, L. Ivanciu, D. Zinca and V. Dobrota, "Securing Health-Related Data Transmission Using ECG and Named Data Networks", Proceedings of the 25th IEEE International Symposium on Local and Metropolitan Area Networks LANMAN 2019, Paris, France, July 1-3, 2019, DOI: 10.1109/LANMAN.2019.8846993.
3. E. Luchian, A. Pop, I.A. Ivanciu, and V. Dobrota, "Context-Based Routing Algorithm for SIP-Based Infotainment in a Smart Vehicle", Proceedings of the 13th International Symposium on Electronics and Telecommunications ISETC 2018, Timisoara, Romania, November 8-9, 2018, pp. 1-4, DOI: 10.1109/ISETC.2018.8583932, WOS:000463031500040.
4. C.M. Petrutu, B.A. Puiu, I.A. Ivanciu, and V. Dobrota, "Automatic Management Solution in Cloud Using NtopNG and Zabbix", Proceedings of the 17th RoEduNet Conference: Networking in Education and Research, Technical University of Cluj-Napoca, Romania, September 6-8, 2018, pp. 148-153, DOI: 10.1109/ROEDUNET.2018.8514142
5. E. Luchian, A. Taut, I.A. Ivanciu, G. Lazar, and V. Dobrota, "Z-Wave-Based Vehicular Blackbox with Automatic Emergency Assistance", Proceedings of the 24th IEEE International Symposium on Local and Metropolitan Area Networks LANMAN 2018, Washington, DC, USA, 25-27 June 2018, pp.85-90, DOI: 10.1109/LANMAN.2018.8475110, WOS:000447699400015.
6. E. Luchian, A. Taut, I.A. Ivanciu, G. Lazar, V. Dobrota, "Mobile Wireless Sensor Network Gateway: A Raspberry Pi implementation with a VPN backend to OpenStack", Proceedings of the 25th International Conference on Software, Telecommunications and Computer Networks IEEE SOFTCOM 2017, Split, Croatia, September 21-23, 2017, pp. 271-275, DOI: 10.23919/SOFTCOM.2017.8115561, WOS:000417414300050.
7. R. Carvajal Gomez, E. Luchian, I.A. Ivanciu, A. Taut, V. Dobrota, and E. Riviere, "On the Impact of Indirect WAN Routing on Geo-Replicated Storage", 23rd IEEE International Symposium on Local and Metropolitan Area Networks LANMAN 2017, Osaka, Japan, 12-14 June 2017, pp. 1-6, Electronic ISSN: 1944-0375, DOI: 10.1109/LANMAN.2017.7972171, WOS:000426966200043.
8. E. Luchian, P. Docolin, and V. Dobrota, "Advanced Monitoring of the OpenStack NFV Infrastructure: A Nagios Approach Using SNMP", Proceedings of the 12th International Symposium on Electronics and Telecommunications ISETC 2016, Timisoara, Romania, October 27-28, 2016, pp. 51-54, DOI: 10.1109/ISETC.2016.7781055, WOS:000390717800012.
9. E. Luchian, C. Filip, A.B. Rus, I.A. Ivanciu, and V. Dobrota, "Automation of the Infrastructure and Services for an OpenStack Deployment using Chef Tool", 15th RoEduNet Conference: Networking in Education and Research, University Politehnica Bucharest, September 7-9, 2016, DOI: 10.1109/RoEduNet.2016.7753200, WOS:000390713800003.
10. I.A. Ivanciu, E. Luchian, E. Riviere, and V. Dobrota, "OpenStack-based Clouds as Holons: A Functional Perspective", 22nd IEEE International Symposium on Local and Metropolitan Area Networks LANMAN 2016, Rome, Italy, June 13-15, 2016, Electronic ISSN: 1944-0375, DOI: 10.1109/LANMAN.2016.7548849, WOS:000390839800011.

Significant solutions:

Seamless Connectivity for Intra/ Inter-Cloud Applications

Automatic Deployment of Infrastructure and Services for a Private Cloud Orchestrated by OpenStack

Active Measurements of the One-Way Delay

Gearbox-Like Routing Algorithm Selection in Runtime

The offer addressed to the economic environment

Research & development	Development of original solutions for active measurements of QoS parameters in Internet (available transfer rate, latency) Development of original implementation of cross-layer techniques for congestion control Development of original solution for permanent Internet connection independent to the network access technologies Development of original implementation for automatic management in cloud Development of the Modified Dijkstra's algorithm running in software-defined network controllers for service providers Development of drivers for IoT hardware
Consulting	Consulting, design, research and prototyping towards development of private cloud solutions Evaluation of security vulnerabilities in computer networks and operating systems IP-based solution for unified communications
Training	Cisco Networking Academy programs offered by UC Labs staff: http://el.el.obs.utcluj.ro/cisco/ CCNA Security version 2.0; IoT Fundamentals: IoT Security, version 1.1; CCNA Cybersecurity Operations, version 1.0; CCNAv7: Introduction to Networks;CCNAv7: Switching, Routing, and Wireless Essentials;CCNAv7: Enterprise Networking, Security, and Automation

CENTRE OF COMPETENCE FOR WIRELESS INTRA-SATELLITE TECHNOLOGIES

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Areas of expertise

Satellite communications and radio channel characterization: Wireless intra-satellite communications, smart site diversity for High Throughput Satellite (HTS) systems, advanced atmospheric channel modelling; Q/V band (40-50 GHz) propagation analysis for next generation satellite communication systems and fading mitigation, space surveillance and tracking, Global Navigation Satellite Systems (GNSS).

Intra-satellite wireless communications: Transmissions in highly reflective environments, replacement of wired connections with wireless UWB links, development of software interfaces to bridge the On-Board Computer-to-instrument connection, validation tests on dedicated laboratory testbed (TRL4).

Wireless positioning and location: GNSS and indoor positioning

Smart antenna arrays deployment: SDR-based direction finding and beamforming.

IntraSAT-Tech received an award (with the "ROSA – ROMANIA 100" medal) from the Romanian Space Agency (ROSA) for the significant contributions in the development of the Romanian spatial activities.



Team

Prof. Tudor Palade, Prof. Calin Munteanu, Prof. Catalin Popa, Prof. Ovidiu Pop, Assoc. Prof. Emanuel Puschita, Assoc. Prof. Botond Kirei, Assist. Prof. Andra Pastrav, Assist. Prof. Paul Dolea, Assist. Cristian Codau, Research Assist. Rares Buta, Research Assist. Raluca Simedroni

Representative

projects

3. **SDR4SST, SDR based multi feed reception system for SST**, AO8856 EXPRO-PLUS, ESA 4000128680/19/D/CT, 2019-2021.
4. **IntraSAT-Tech, Centre of competence for wireless Intra-SATellite Technologies**, STAR 115/2016, ROSA, 2016-2019, <https://intrasat-tech.utcluj.ro/drupal/node/2>
5. **RDAntenna, Compact retro-directive wireless antenna network for wireless systems in IEEE 802.11 and IEEE 802.11 communication protocols**, 6 SOL/2017 within PNCDI III, 2017-2020, <https://intrasat-tech.utcluj.ro/drupal/RDAntenna>
6. **ASAPE, Group of the AlphaSat Aldo Paraboni propagation Experimenters**, Open forum of researchers performing propagation campaigns with the Aldo Paraboni payload and other satellite payloads at Ka band.

Significant results

Research Articles (The most representative publications of the past 5 years):

3. Puschita, E., Pastrav A., Palade T., et al., "A UWB Solution for Wireless Intra-Spacecraft Transmissions of Sensor and SpaceWire Data", International Journal of Satellite Communications and Networking, John Wiley & Sons, Ltd., p. 1–21, 2019 (jurnal ISI, IF=1.633, Q2). <https://doi.org/10.1002/sat.1307>.
4. Pastrav, A., Palade, T., Dolea, P., Simedroni, R., Codau, C., Puschita, E., "The Alphasat Experiment at Cluj-Napoca – Preliminary Results," 2018 International Symposium on Electronics and Telecommunications (ISETC), Timisoara, 2018, pp. 1-4. WOS:000463031500051. <https://doi.org/10.1109/ISETC.2018.8583877>.
5. Pastrav, A., Codau, C., Puschita, E., Dolea, P., Palade, T., "Conceptual Architecture of a Retrodirective Antenna System with Beamforming Capabilities," 2018 International Conference on Communications (COMM), Bucuresti, 2018, pp. 225-230. WOS:000449526000041. <https://doi.org/10.1109/ICComm.2018.8484740>.
6. Codău C., Voina, A., Pastrav, A., Palade, T., Puschita, E., Hedesiu, H., Chirap, C., "Experimental evaluation of the IEEE 802.11ac standard using NI USRP 2954R," 2017 16th RoEduNet Conference: Networking in Education and Research (RoEduNet), Targu Mures, 2017, pp. 1-6. WOS:000425040000037 <https://doi.org/10.1109/ROEDUNET.2017.8123765>.
7. Voina, A., Codău C., Pastrav, A., Palade, T., Puschita, E., Hedesiu, H., Chirap, C., "Implementation of a SDR-based redundant access network using NI USRP-RIO," 2017 16th RoEduNet Conference: Networking in Education and Research (RoEduNet), Targu Mures, 2017, pp. 1-6. WOS:000425040000036. <https://doi.org/10.1109/ROEDUNET.2017.8123764>.
8. Rares, B., Codau, C., Pastrav, A., Palade, T., Hedesiu, H., Balauta, B., Puschita, E., "Experimental Evaluation of AoA Algorithms using NI USRP Software Defined Radios," 2018 17th RoEduNet Conference: Networking in Education and Research (RoEduNet), Cluj-Napoca, 2018, pp. 1-6. <https://doi.org/10.1109/ROEDUNET.2018.8514133>.
9. Codău, C., Buta, R., Palade, T., Păstrăv, A., Dolea, P., Simedroni, R., Puschita E., "Experimental Evaluation of a Beamforming-capable System using NI USRP Software Defined Radios," 2019 18th RoEduNet Conference: Networking in Education and Research (RoEduNet), Galati, Romania, 2019, pp. 1-6. doi: 10.1109/ROEDUNET.2019.8909456.
10. I. Domuta and T. P. Palade, "Sliding DFT and Zero Padding," 2019 42nd International Conference on Telecommunications and Signal Processing (TSP), Budapest, Hungary, 2019, pp. 154-157. doi: 10.1109/TSP.2019.8769076.

Case Study (National Instruments)

1. Direction-Finding System Deployment Based on the NI Platform, Buta, R., Codau, C., Pastrav, A., Palade, T., Dolea, P., Hedesiu, H., Balauta, B., Chirap, C., Puschita, E., Radiocommunications Research Group, Communications Department, Technical University of Cluj-Napoca and National Instruments Romania [Available online]: <http://sine.ni.com/cs/app/doc/p/id/cs-17758?niscr=RSS-featured-en>

Significant solutions:

1. FPGA-based intra-satellite wireless communication modules designed to interconnect intra-spacecraft components.
2. Software communication stack for encapsulation of the SpaceWire packets.
3. SpW-to-UART bridge to interface On-Board Computer (OBC), payload and instrumentation.
4. Localization and positioning solution, smart antenna arrays for direction finding and beamforming.

The offer addressed to the economic environment

Research & development	Terrestrial, satellite and intra-satellite radio channel analysis and modelling. High Throughput Satellite network planning and behavior analysis through simulation. Adaptive beamforming techniques and MIMO systems applications.
Consulting	Consulting on satellite systems and radio channel modeling for intra-satellite and Earth-to-satellite communications, smart antenna design, adaptive beamforming, and direction finding.
Training	SICAS Master (Integrated Communication Systems for Special Applications) including: Wireless systems, Interferences and electromagnetic compatibility, Satellite communications systems, Measurement of radio systems, Radio networks planning. http://master-sicas.utcluj.ro

NATIONAL CENTRE OF INNOVATIVE MANUFACTURING

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Areas of expertise

Industrial Engineering (Laser Beam Machining, Water Jet Cutting, Electrical Discharge Machining, Rapid Prototyping of complex parts and master models for Rapid Tooling, etc.); **Flexible Manufacturing Systems** (CNC Manufacturing Systems); **CAD/CAM Systems** (Applied Industrial design for products and technologies); **Production Engineering** (Innovative Manufacturing for product development and Rapid Tooling technologies); **Automotive Engineering** (Competitive Manufacturing of car components); **Composite Materials** (Manufacturing technologies of complex parts made out of composite materials enforced with carbon fiber); **Engineering and Technologies** (Concurrent engineering, Methodologies and Software tools in Design for Manufacture and Assembly); **Biomedical engineering**, (Prototypes, customized implants, new biocompatible materials); **Operational Research**. Development of algorithms for solving TSP, Flowshop Scheduling, Optimal Nesting etc. **Technology Processes Optimization Development of algorithms** for linear and nonlinear optimization, without/with constraints.

Team

Prof. Dr. Eng. Petru Berce, Prof. Dr. Eng. Nicolae Bâlc, Prof. Dr. Eng. Mircea Ancău, Prof. Dr. Eng. Marius Bulgaru, Assoc.Prof. Dr. Eng. Mihai Damian, Assoc.Prof. Dr. Eng. Alexandru Cărean, Prof. Dr. Eng. Domnița Frățilă, Assoc. Prof. Dr. Eng. Răzvan Păcurar Assist. Prof. Dr. Eng. Cristian Caizar, Assist. Prof. Eng. Horea Chezan, Assist., Assist. Prof. Dr. Eng. Radu Sever Adrian, Assist. Prof. Dr. Eng. Ancuța Păcurar, Assist. Prof. Dr. Eng. Dan Leordean, Assist. Prof. Dr. Eng. Paul Bere, Assist. Dr. Eng. Nicolae Panc, Assist. Dr. Eng. Emilia Sabău, Assist. Dr. Eng. Alexandru Popan, Assist. Dr. Eng. Alina Luca

Representative projects

DigiTech – “Implementation of additive technologies in complex and overbuilt components manufacturing”, PNIII-P1-1.2, PCCDI 2018, (2018-2020)
“AMaTUC – Boosting the scientific excellence and innovation capacity in additive manufacturing of the Technical University of Cluj-Napoca”, HORIZON 2020 – twinning, 2016-2018
“Research concerning the development of new stochastic heuristic algorithms for solving flowshop scheduling problems”, PNII-Idei, <http://www.ci579.utcluj.ro> (2008-2011)
“Expert Systems for Technology Processes Optimization. The research contracts deals with rapid prototyping and tooling optimization”, PNII, <http://www.esop.utcluj.ro> (2007-2010)
Adm-ERA, “Reinforcing Additive Manufacturing research cooperation between the Central Metallurgical

Research and Development Institute and the European Research Area", European FP7 Project, (2011-2013)
BIOMAPIM, "New Biocompatible Materials for personalized implants made by SLS and SLM", PCCE, (2010-2013)
OP3MET, "Optical 3D Metrology - Automated in-line metrology for quality assurance in the manufacturing industry", European FP6 Project, (2006-2008)
"Innovative Manufacturing Network", (2005-2008)

Significant results

The most representative publications of the past 5 years:

1. Todea, M.; Vulpoi, A.; Popa, C.; et al., Effect of different surface treatments on bioactivity of porous titanium implants, *JOURNAL OF MATERIALS SCIENCE & TECHNOLOGY* Volume: 35 Issue: 3 Pages: 418-426 Published: MAR 2019
2. C. S. Miron-Borzan, M. C. Dulescu, and P. Berce, "Bending and compression tests for PA 2200 parts obtained using Selective Laser Sintering method," in 4th International Conference on Computing and Solutions in Manufacturing Engineering 2016 - Cosme'16, vol. 94, G. Oancea and M. V. Dragoi, Eds. (MATEC Web of Conferences, Cedex A: E D P Sciences, 2017.
3. D. Fratila, "Numerical and Experimental Approach of Cutting Temperatures to Green Turning of 42CrMo4 Steel," *Materials and Manufacturing Processes*, vol. 31, pp. 657-666, Apr 2016
4. C. S. M. Borzan, M. C. Dulescu, V. Ceclan, A. Trip, M. Ridzon, and P. Berce, "PA 2200 vs. PMMA: Comparison Between the Mechanical Properties Obtained for the 2 Biocompatible Materials", *Materiale Plastice*, vol. 53, pp. 1-5, Mar 2016.
5. Petru Berce, et. al., „Medical applications of Additive Manufacturing technologies”, *Romanian Academy Publishing House*, Bucharest, 2015
6. Leordean, Dan; Dulescu, Cristian; Marcu, Teodora; P. Berce et al "[Customized implants with specific properties, made by selective laser melting](#)" *RAPID PROTOTYPING JOURNAL* Volume: 21 Issue: 1 Pages: 98-104, Published: 2015
7. Leordean, Dan; Radu, S. A.; Fratila, D.; P. Berce, "[Studies on design of customized orthopedic endoprotheses of titanium alloy manufactured by SLM](#)", *INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY* Volume: 79 Issue: 5-8 Pages: 905-920 Published: JUL 2015
8. Petru Berce, et.al., „Additive Manufacturing Technologies and their applications”, *Academy Publishing House*, Bucharest, 2014.
9. Brie, Ioana-Carmen; Soritau, Olga; Dirzu, Noemi; P.Berce et al., "[Comparative in vitro study regarding the biocompatibility of titanium-base composites infiltrated with hydroxyapatite or silicatitanate](#)" *JOURNAL OF BIOLOGICAL ENGINEERING* Volume: 8 Article Number: 14 Published: JUN 19 2014
10. R. Păcurar, P. Berce, "Research on the durability of injection molding tools made by selective laser sintering technology", in *Proceedings of the Romanian Academy series A-mathematics physics technical sciences information science*, vol. 14, no. 3, pp. 234-241, 2013.

International Patent: "Acting Device", registered in USA and Germany;

Others:

Competitive Manufacturing techniques transferred to industrial partners and used in commercial contracts with companies from Germany and England

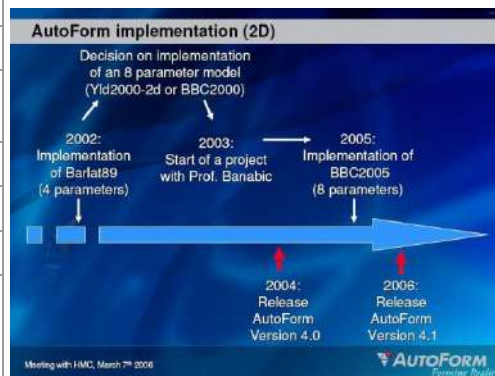
The offer addressed to the economic environment

Research & development	Develop new materials, suitable for Rapid Prototyping using the SLS and SLM equipment. Development of optimization algorithms. Design for Competitive Manufacturing of Industrial Products. Rapid Tooling and Additive Manufacturing Rapid Prototyping using the well known CNC machines, available within DME-TUCN. Researches concerning the technological processes optimization.
Consulting	External evaluation of products/projects; Select the optimal RP technological route; Consulting in the area of operational research (industrial application of combinatorial optimization: calculation of minimum path length, optimal nesting, flowshop scheduling etc.).
Training	We offer training in the field of Numerical Optimization Techniques in Computer Aided Design. Training for people from industry, in the following fields: Use modern CAD systems for integrated applied design; Rapid Tooling; Modern Manufacturing Technologies; Using the modern RP equipment; CNC machining; Metrology and Quality Engineering.

RESEARCH CENTRE IN SHEET METAL FORMING-CERTETA

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Areas of expertise

The main areas of our scientific interest and activity are:

Modelling of the material behavior
Formability of metallic materials
Simulation of the sheet and tube metal forming processes
Virtual fabrication in metal forming

Team

Prof. Dr. Eng. Dorel Banabic, Assoc. Prof. Dr. Eng. Dan-Sorin Comşa, Assoc. Prof. Dr. Eng. Lucian Lăzărescu

Representative projects

Analysis of formability and mechanical behavior of metallic materials – research contract with FONTANA Pietro SPA Italy (2018)
“From micro to macro - continuum scale modelling of advanced materials in virtual fabrication”, PNII, (2009-2013)
“Holistic, extensible, scalable and standard Virtual Factory Framework”, European FP7 Project, (2009-2013)
“Sheet metal formability for special metal forming processes”, Humboldt Foundation (Joint Research Project), (2005-2008)
“Improvement of performances of formability models for sheet metals using new constitutive laws”, Swiss National Science Foundation (Joint Research Project), (2005-2008)
VIRFAB, “Integrated platform for the simulation of forming processes in virtual manufacturing”, CEEX, (2006-2008)
VIF, “Virtual Intelligent Forging”, European FP6 Project, (2004-2008)

Significant results

Books and contribution to books:

1. Lăzărescu L., Comşa D.S., Banabic D., Analiza cu elemente finite a proceselor de prelucrare prin deformare plastică, Casa Cărţii de Ştiinţă, Cluj Napoca, 2018
2. Lăzărescu L., Comşa D.S., Banabic D., Proiectarea tehnologiilor si a matritelor pentru prelucrarea tablelor metalice, Casa Cărţii de Ştiinţă, Cluj Napoca, 2018.
3. Frangopol P., Banabic D., David D., Educaţia şi cercetarea românească. Starea prezentă şi perspectiva, Casa Cărţii de Ştiinţă, Cluj Napoca, 2018.
4. Banabic D., Balan T., Comşa D.S., Anisotropic Yield Criteria for Aluminum Alloy Sheets, In: Encyclopedia of Aluminium and its Alloys (ed. Totten G.E.), CRC Press, New York, 2019.
5. Banabic D., Comşa D.S., “BBC2005 yield criterion used in the numerical simulation of sheet metal forming processes”, In: (Ed.:Tekkaya E.A.), 60 Excellent Inventions in Metal Forming), Springer, Heidelberg Berlin, 2015
6. Banabic D., Lazarescu L., Comşa D.S., “An innovative procedure for the experimental determination of the Forming Limit Curves”, In: (Ed.:Tekkaya E.A.), 60 Excellent Inventions in Metal Forming), Springer, Heidelberg Berlin, 2015
7. D. Banabic, “Sheet Metal Forming Processes”, in Science Press, Beijing, 2015

The most representative publications of the past 5 years:

1. D. Lumelskyj, J. Rojek, L. Lazarescu, D. Banabic, Determination of forming limit curve by finite element method, *Procedia Manufacturing*, 27 (2019), 78–82.
2. Banabic D., Barlat F., Cazacu O., Kuwabara T., Advances in Anisotropy of Plastic Behaviour and Formability of Sheet Metals, *International Journal of Materials Forming*, (13(2020) (IF=1,75)
3. Banabic D., Kami A., Comsa D.S., Eyckens P., Developments of the Marciniak-Kuczynski Model for Sheet Metal Formability: a Review, *Journal of Materials Processing Technology (Special Issue in Honor of Prof. Marciniak)*, (2020) (IF=4,178).
4. Da-Yong Chen, Yong Xu, Shi-Hong Zhang, Yan Ma, Ali Abd El-Aty, Dorel Banabic, Artur I. Pokrovsky, Alina A. Bakinovskaya, A novel method to evaluate high strain rate formability of sheet metals under impact hydroforming, *Journal of Materials Processing Technology*, (2020) (IF=4.178)
5. Lucasz Madej, Dorel Banabic, 100th birthday of Professor Zdzisław Marciniak, *Journal of Materials Processing Technology*, (2020) (IF=4.178)
6. Weihao Jiang, Wenlong Xie, Hongwu Song, Lazarescu Lucian, Shihong Zhang, Dorel Banabic, A modified thin-wall tube push-bending process with polyurethane mandrel, *International Journal of Advanced Manufacturing Technology*, (2020)
7. Chun-Qing Hu, Hong-Wu Song, Hai Liu, D. Banabic, Shi-Hong Zhang, Ming Cheng, Shuai-Feng Chen, *A statistical model for contact orientation and anisotropy in granular assemblies*, *Proceedings of the Romanian Academy, Series A*, 19(2018), Nr.2, 175-183
8. Ma, Yan; Xu, Yong; Zhang, Shi-Hong; et al., Investigation on formability enhancement of 5A06 aluminium sheet by impact hydroforming *CIRP ANNALS-MANUFACTURING TECHNOLOGY* Volume: 67 Issue: 1 Pages: 281-284 Published: 2018
9. A. Kami, B. M. Dariani, A. S. Vanini, D.S. Comsa, D. Banabic, Numerical determination of the forming limit curves of anisotropic sheet metals using GTN damage model, in *J. Materials Proc. Technol.*, 216 (2015) 472–483.
10. J. Gawad, D. Banabic, A. v.Bael, D. S. Comsa, M. Gologanu, P. Eyckens, P. v. Houtte, D. Roose, “An evolving plane stress yield criterion based on crystal plasticity virtual experiments”, in *Int. J. Plasticity*, vol. 75, 2015, pp.141-169.
11. M. Vrh, M. Halilović, B. Starman, B. Štok, D. S. Comsa, D. Banabic, “Capability of the BBC2008 yield criterion in predicting the earing profile in cup deep drawing simulations”, in *European J. of Mechs.*, vol. 45, 2014, pp. 59-74.
12. S. Bruschi, T. Altan, D. Banabic, P. F. Bariani, A. Brosius, J. Cao, A. Ghiotti, M. Khraisheh, M. Merklein, E. Tekkaya, “Testing and Modeling of Material Behavior and Formability in Sheet Metal Forming Processes”, in *Annales of CIRP*, vol. 63, 2014, pp. 727-749.

Significant solutions:

The members of the CERTETA Centre developed a yield criterion for anisotropic metallic materials called BBC2005. Its mathematical formulation has been implemented in the commercial finite element code AutoForm in order to simulate the sheet metal forming processes. One may notice the fact that the AutoForm program is used by 95% of the world's leading manufacturers of automobiles and airplanes, which assures a global scale application of the model BBC2005. This means that the model is applicable at the global scale and CERTETA Centre is visible in automotive and airplane production industries (according to the AutoForm official site www.AutoForm.com, over 2500 users from 500 companies located in 40 countries). The Material Modelling Committee of the Japan Association for Nonlinear CAE (JANCAE) has recently developed a unified user-subroutine (called UMMDP, Unified Material Model Driver for Plasticity), which couple different hardening rules and yield functions, including BBC 2005 and BBC2008 models developed by the CERTETA team. This subroutine can be used within any commercial FE software (Abaqus, LsDyna, ANSYS, MSC Marc, Radioss) by using the unified interface routine.

Other remarkable results consist in the fact that CERTETA developed a program for the calculation the forming limit curves, called FORM-CERT. This program is used by several automotive companies (Daimler, Audi, etc.).

The third major achievement consists in the development of a model for the prediction of Forming Limit Bands. In this research field, CERTETA is a pioneering laboratory at international level.

Products and technologies:

The yield criteria developed in order to describe the plastic anisotropic behavior of the metallic sheets. The BBC2005 yield criterion has been implemented in the AutoForm FE commercial code and in the UMMDP user subroutine.

Hierarchical Multi-Scale (HMS) model coupled with BBC2008 yield criterion.

FORM-CERT commercial program for the determination the forming limit curves.

Technology and expertise to determine the mechanical parameters of the metallic sheets

The offer addressed to the economic environment

Research & development	CERTETA currently develops constitutive models for anisotropic metallic materials, with special emphasis on cold-rolled sheet metals. The theoretical prediction of the forming limits is also an important domain of research. The models are developed with the aim of being implemented in the programmes used for the numerical simulation of the forming processes and computer-aided design of the forming tools. The members of the CERTETA are also involved in the development of experimental methods for the determination of the mechanical parameters and limit strains of metallic sheets.
Consulting	The research centre provides consulting services in the field of materials testing, numerical simulation of the sheet metal forming processes, and computer-aided design of forming tools.
Training	The research centre offers training courses in the field of numerical simulation of the metal forming processes using finite element programmes. The members of team have also a sound expertise in the field of metal forming procedures and their implementation in industry.

RESEARCH CENTER FOR INDUSTRIAL ROBOTS SIMULATION AND TESTING

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Areas of expertise

Innovative development of robotic systems with complex structure, focused on parallel architectures
 Medical robots: surgical robots, robots for cancer treatment, robots for cancer diagnosis, robots for rehabilitation
 Simulation and Control of complex robotic systems
 Robotic telemanipulation systems
 Modeling and simulation of mechatronic systems with applications in aerodynamics and fluid flow or fluid modeling and simulation

Team

Prof. Dr. Eng. Doina Pislă, Prof. Dr. Eng. Nicolae Plitea, Assoc. Prof. Dr. Eng. Bogdan Gherman, Assoc. Prof. Dr. Eng. Calin Vaida, Prof. Dr. Eng. Tiberiu Antal, Prof. Dr. Eng. Tiberiu Itul, Prof. Dr. Eng. Adrian Pislă, Lecturer Dr. Eng. Paul Tucan, Dr. Eng. Iosif Birlescu, Lecturer Dr. Eng. Daniela Jucan, Assoc. Prof. Dr. Eng. Dan Frunza, Prof. Dr. Eng. Dan Opruta, Prof. Dr. Eng. Liviu Vaida, Assoc. Prof. Dr. Eng. Angela Plesă

Representative projects

IMPROVE, "Innovative approach precision on robotic assisted surgical treatment of liver tumors based on integrated diagnostic imaging molecular", Code PN-III-P1-1.2-PCCDI 2018, (2018-2020)
AGEWELL, "Innovative approaches rehabilitation and Assistive Robotics for Healthy Ageing", POC project ID 37_215, MySMIS code 103415, (2016-2020)
INNOHEALTH, "An innovative robotic system for upper limb rehabilitation", RIS 2019 Innovation Call, 21540/07.08.2019, EIT Health (2019)
TASUK, "Manipulation Systems for Sample Handling in a Sample Receiving Facility", TASUK/16/11305/NBO/1424, ESA European Space Agency (2015-2020)
ROBOCORE, "Robotic assisted prostate biopsy, a high accuracy innovative method", Code PN-II-PT-PCCA-2013-4-0647 (2014-2017)
ACCURATE, "A multi-purpose needle insertion device for the diagnosis and treatment of cancer", Code PN-II-RU-TE- 2014-4-0992, (2015-2017)
IOS, "Instructor Operation Station designed for space applications", RDI, Romanian Space Agency (2014-2015)
CHANCE, "Robotic assisted brachytherapy, an innovative approach of inoperable cancers", Code PNII-PT-PCCA, (2012-2015)
CARE-Robotics, "Creative Alliance in Research and Education focused on Medical and Service Robotics", International, Scopes IP Grant, (2011-2015)
SIMCOSURG, "Simulation and control techniques for robots used in minimally invasive surgery", Capacities, Module III, bilateral cooperation, Slovenia-Romania (2011-2013)

PROINS, “Development of innovative kinematic and dynamic models for parallel robots in surgical applications”, Capacities, Module III, bilateral cooperation, Austria – Romania (2011-2013)
HEPSIM, “Innovative development of an innovative virtual system for e-learning in hepatic surgery”, PNII, (2008-2011)
PARMIS, “Multidisciplinary development of surgical robots based on parallel structures”, PNII, (2007 - 2010)

Significant results

The most representative publications of the past 5 years:

1. Vaida, C., Birlescu, I., Pisla, A., Ulinici I., Tarnita, D., Carbone, G., Pisla, D., “Systematic Design of a Parallel Robotic System for Lower Limb Rehabilitation”, IEEE ACCESS, vol. 8, 34522(15), 2020 (Impact factor: 4.098)
2. Tucan P., Gherman B., Major K., Vaida C., Major Z., Plitea N., Carbone G., Pisla D., “Fuzzy Logic Based Risk Assessment of a Parallel Robot for Elbow and Wrist Rehabilitation”, Int. J. Environ. Res. Public Health, 17(2), 654, 2020 (Impact Factor: 2.468)
3. Pisla D., Vaida, C., Birlescu I., Nadim, A.H., Gherman, B., Corina Radu, Plitea N., “Risk Management for the Reliability of Robotic Assisted Treatment of Non-resectable Liver Tumors”, Appl. Sci., 10(1), 52, 2020, (Impact Factor: 2.217)
4. Birlescu I., Manfred, H., Vaida C., Plitea N., Nayak A., Pisla, D., “Complete Geometric Analysis Using the Study SE(3) Parameters for a Novel, Minimally Invasive Robot Used in Liver Cancer Treatment”, Symmetry, 11(12), 1491, 2019 (Impact factor: 2.143)
5. Tucan P., Vaida C., Plitea N., Pisla A., Carbone G., Pisla D., “Risk-Based Assessment Engineering of a Parallel Robot Used in Post-Stroke Upper Limb Rehabilitation”, Sustainability 11(10), 2893, 2019, (Impact factor: 2.075)
6. Gherman, B., Birlescu, I., Plitea, N., Carbone, G., Tarnita, D., Pisla, D., “On the singularity-free workspace of a parallel robot for lower-limb rehabilitation”, Proceedings of The Romanian Academy, Series A, 20(4), pp. 383–391. 2019 (Impact factor: 1.402)
7. Pisla, D.; Birlescu, I.; Vaida, C. et. al., “Algebraic modeling of kinematics and singularities for a prostate biopsy parallel robot”, Proceedings Of The Romanian Academy, Series A, Volume: 19 Issue: 3 Pages: 489-497 2018 (Impact factor: 1.402)
8. Pisla, D.; Tucan, P.; Gherman, B. et al., “Development of a parallel robotic system for transperineal biopsy of the prostate”, MECHANICAL SCIENCES Volume: 8 Issue: 1 Pages: 195-213, 2017 (Impact factor: 1.052)
9. D. Pisla, B. Galdau, F. Covaciu, C. Vaida (c.a.), D. Popescu, N.Plitea, “Safety Issues in the Development of the Experimental Model for an Innovative Medical Parallel Robot used in Brachytherapy”, International Journal of Production Research, Vol. 55(3), pp. 684-699, 2016 (ISI Journal, Impact Factor: 3.199)
10. N. Plitea, A. Szilaghyi, D. Pisla, “Kinematic Analysis of a new 5-DOF Modular Parallel Robot for Brachytherapy”, Robotics and Computer Integrated Manufacturing, vol. 31, 2015 (Impact factor: 4.392)

Patents:

1. Vaida, C., Plitea, N., Pîslă, D., Gherman, B., Suciu, M., “Orientation module with multiple curvatures”, Patent RO 129923 B1 (2019)
2. Plitea, N., Pîslă, D., Vaida, C., Gherman, B., „Surgical Robot”, Patent RO 126271 (2012)

Significant products:

1. Innovative robotic system for lower limb rehabilitation, 2020
2. Innovative robotic system for upper limb rehabilitation, 2019
3. Innovative robotic system for prostate biopsy, 2018
4. Innovative robotic system for brachytherapy, 2016
5. Innovative robotic system for minimally invasive surgery, 2011

The offer addressed to the economic environment

Research & development	Medical Robotics With over 15 years of experience in the field of invasive medical robotics CESTER expresses interest in further cooperation in this field, of developing of optimized robotic systems for a given application. Mechanisms synthesis Through its specialists, CESTER research center develops advanced studies in the field of synthesis of new conceptual models of mechanisms with complex structure, focused on parallel architectures. Precision Robotics and Microrobotics The development of innovative solutions for robots, micro-robots and reconfigurable structures with parallel architecture with applications in various fields including. Fluid Flow Modeling CESTER Research Center has experience in modeling classical fluid flow and non-Newtonian fluids
Consulting	Competitive Design. Through its collective experience, CESTER provides advice in designing competitive products. High power drives. High power drives are achieved almost exclusively hydraulically. CESTER specialists have experience embodied in numerous collaborative projects with industrial partners to develop applications on this subject.
Training	Through its training center, CESTER offers those interested in advanced training Solid Edge and Siemens NX courses as well as basic courses in control systems with the B & R Automation Platform.

NON-CONVENTIONAL TECHNOLOGIES AND COMPETITIVE MANUFACTURING

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Areas of expertise

3D Printing (SLM - Selective Laser Melting; SLS - Selective Laser Sintering); **FDM** (Fused Deposition Modelling); **Automotive Engineering** (Competitive Manufacturing of car components); **Rapid Tooling** (Investment Casting, Silicone Rubber Molding, Metal Spray Tooling); **Medical Applications of AM** (Prototypes, Customized Implants, New biocompatible materials); **Industrial Engineering** (Laser Beam Machining, Water Jet Cutting, Electrical Discharge Machining); **CAD/CAM/CAE** (Applied Industrial design for products and technologies); **Production Engineering** (Innovative manufacturing for product development); **Concurrent engineering** (Methodologies and software tools in Design for Manufacture and Assembly-DFMA); **Composite Materials** (Manufacturing composite materials, reinforced with carbon/glass fiber).

Team

Prof. Dr. Eng. Nicolae Bălc, Assoc. Prof. Dr. Eng. Alexandru Cărean, Prof. Dr. Eng. Domnița Frățilă, Assoc. Prof. Dr. Eng. Răzvan Păcurar, Assoc. Dr. Eng. Paul Bere, Lect. Dr. Eng. Nicolae Panc, Lect. Dr. Eng. Emilia Sabău, Lect. Dr. Eng. Alexandru Popan, Lect. Dr. Eng. Alina Popan.

Representative projects

DiCoMI – H2020, „Directional Composites through Manufacturing Innovation”, 2018–2022, TUCN Coord: Prof. N. Bălc, <http://www.dicomi.eu>;

AMaTUC – H2020, „Boosting the scientific excellence and innovation capacity in additive manufacturing of the TUC-N”, 2016–2018, Coord: Prof. N. Bălc. www.amatuc.com;

PCCDI Project: „Implementarea tehnologiilor aditive în fabricarea componentelor complexe și suprasolicitate”, 2018-2020, TUCN coord: Prof. P. Bere;

OpTi-DeP – Bridge Grant, „Optimizarea tipăririi 3D pentru Aplicații Dentare Personalizate”, 2016-2018, Coord: Prof. N. Bălc;

PreMCo – Bridge Grant, „Dezvoltarea posibilităților de prelucrare a materialelor compozite avansate prin tăiere de precizie cu jet de apă”, 2016-2018, Coord: S.L. A. Popan; <http://www.premco.utcluj.ro>;

Bridge Grant, „Optimizarea materialelor compozite polimerice armate cu fibre și a tehnologiei de fabricație utilizate în construcția elementelor de caroserie pentru vehicule electrice”, 2016-2018, Coord: S.L. P. Bere;

PP H2020 Project, „Support AMaTUC”, 2016-2018, Coord: Prof. N. Bălc;

PECIFCO – PCCA Project, „Implanturi cranio-faciale personalizate obținute prin prototipare inovativă 3D din materiale compozite ranforsate cu fibra de sticlă”, 2014-2017, Buget: 250.000 RON, Team Leader UTCN: Prof. N. Bălc;

Significant results

Representative publications of the last 5 years:

1. Popan, Ioan Alexandru; Bocanet, Vlad; Balc, Nicolae; et al., „Investigation on Feed Rate Influence on Surface Quality in Abrasive Water Jet Cutting of Composite Materials”, Monitoring Acoustic Emissions Advances in Manufacturing Engineering and Materials, ICMEM 2018 Book Series: Lecture Notes in Mechanical Engineering, pg. 105-113 Published: 2019;
2. Cosma, C.; Balc, N.; Moldovan, M.; et al., „Post-processing of customized implants made by laser beam melting from pure Titanium”, Journal of Optoelectronics and Advanced Materials, Volume: 19, Issue: 11-12, pg. 738-747 Published: 2017;
3. Balc, Nicolae; Vilau, Cristian, „Design for Additive Manufacturing, to produce assembled products, by SLS”, 8th International Conference on Manufacturing Science and Education (MSE 2017) - Trends in New Industrial Revolution, Book Series: MATEC Web of Conferences, Volume: 121, Article Number: UNSP 04002, Published: 2017;
4. Kessler, Julia; Balc, Nicolae; Gebhardt, Andreas; et al., „Basic design rules of unit cells for additive manufactured lattice structures”, Modern Technologies In Manufacturing (MTEM 2017 - AMATUC), Book Series: MATEC Web of Conferences, Volume: 137, Article Number: UNSP 02005, Published: 2017;
5. D. Fratila, "Numerical and Experimental Approach of Cutting Temperatures to Green Turning of 42CrMo4 Steel", Materials and Manufacturing Processes, Vol. 31, pg. 657-666, Published: 2016;
6. N. Balc, S.C. Cosma, J. Kessler, V. Mager, "Research on improving the outer surface quality of the parts made by SLM", Journal: Applied Mechanics and Materials, Vol. 808, pg. 199-204, 2015, Trans Tech Publications, Switzerland doi:10.4028/www.scientific.net/AMM.808.199;
7. Leordean, D., Radu, S.A., Fratila, D., Berce, P., "Studies on design of customized orthopedic endoprostheses of titanium alloy manufactured by SLM", in International Journal of Advanced Manufacturing Technology, Volume: 79, Issue: 5, pg. 905-920, 2015, DOI 10.1007/s00170-015-6873-0, FRI: 1,779;
8. Radu, S.A., Leordean, D., Bâlc, N., Nemeş, O., "Resin type influence on moulded parts final dimensions", Studia Universitatis Babes-Bolyai, Chemia, Vol. 60 Issue 2, pp. 219-228, 2015, FRI: 0,191.

Selected Books

1. Berce, P., Bâlc, N., Păcurar R., ş.a., (2014), *Tehnologii de fabricație prin adaugare de material și aplicațiile lor*, Editura Academiei Romane, București.
2. Berce, P., Bâlc, N., Leordean Dan, ş.a., (2015), *Aplicațiile medicale ale tehnologiilor de fabricație prin adăugare de material*, Editura Academiei Romane, București - Awarded with "Henri Coandă" prize at The annual awarding ceremony of Romanian Academy, 15 December 2017, Bucharest (Romania).

International Patent: „Acting Device”, registered in USA and Germany; N. Balc, D. Leordean, No. US9199358 B2, 2015;

National Patents:

- „Process and device for making plates of polymeric composite materials reinforced with fibers”, P. Bere, P. Berce, O. Nemes, N. Balc;
- „Method and Composite Material for Ornamental synthetic plates manufacturing”, E. Sabău, N. Balc, P. Bere, RO130062-A2, 2015.

Others:

- **Chairman** of the MTEM 2013, 2015, 2017 and 2019 **International Conference on Modern Technologies in Manufacturing**, held in Cluj-Napoca, Romania - <http://www.mtem.utcluj.ro/>;
- Competitive Manufacturing techniques transferred to industrial partners and used in commercial contracts with companies from Germany and England;
- Invited to participate within the **Destaco brain storming** on: The Next Generation of the Automotive Power Clamps , week 13 / 2009, Oberursel – Frankfurt / Germany, Invited by Joachim Liehr, Geschäftsführer / General Manager of DE-STA-CO Europe GmbH <http://www.destaco.com/>;
- **Invited Speaker** at 2009 **Dover Presidents Meeting** (<http://www.dovercorporation.com/>), **N. Bâlc**, Engineering resources in CEE, including Romania, Warsaw, 3-rd March 2009, Poland – Invited by Joachim Liehr, Geschäftsführer / General Manager of DE-STA-CO Europe GmbH <http://www.destaco.com/>.

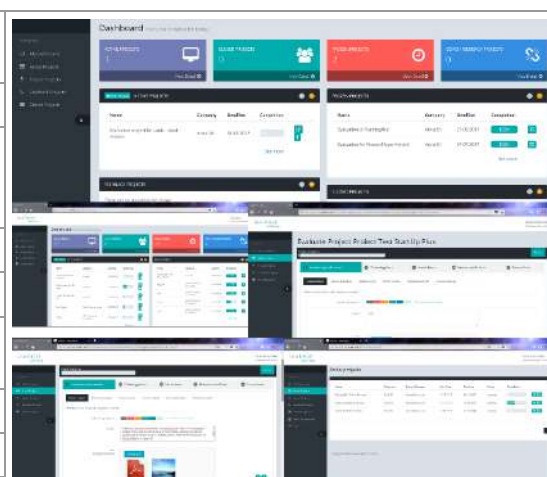
The offer addressed to the economic environment

Research & development	Design for Competitive Manufacturing of Industrial Products. Rapid Tooling and Additive Manufacturing
Consulting	External evaluation of products/projects
Training	Training for people from industry, in the following fields: - Use modern CAD systems for integrated applied design - Rapid Tooling - Modern Manufacturing Technologies

RESEARCH CENTER FOR ENGINEERING AND MANAGEMENT OF INNOVATION

Contact details

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InnDRIVE eXXplorer: expert system to evaluate start-ups businesses (technology transferred to Arxia) (2019)

Areas of expertise

RESIN is focused on two major areas: 1. innovation engineering and 2. innovation management. The subfields of research in the case of innovation engineering are: 1.1. science and engineering of artificial intelligence in robotics systems; 1.2. science of interdisciplinary design for breakthrough innovations; 1.3. innovation for X. The subfields of research in the case of innovation management are: 2.1. science of smart innovation, 2.2. science of collaborative innovation, 2.3. innovation by structural transformation, 2.4. micro, mezzo and macro innovation systems.

Team

Academic staff: Stelian Brad (1.1-2.4), Mircea Murar (1.1, 1.2), Stefan Craciun (1.2), Ionut Chis (1.3), Claudiu Ratiu (1.3), Emilia Brad (1.3), Anca Stan (2.4), Dragos Bartos (2.3), Sanda Timoftei (1.1), Claudiu Nedeski (1.3), Cristina Miron-Borzan (1.2, 1.3) **PhD researchers:** Daniel Homorodean (2.1), Eugen Otava (2.2), Diana Veltan (2.3), Gabriela Uglea (1.3), Cristian Lang (2.4), Dan Balan (2.1), Andreas Zagors (1.3), Nino Hoch (2.3), Cosmina Mendoiu (1.1), Vlad Florian (1.1), Maria Slavoaca (1.2) **Students:** Miruna Peris (1.2), Micsku Tamas (1.1), Roxana Morar (1.1)

Representative projects

InnoCAP Transylvania, Services to Enhance the Innovation Management Capacity of SMEs, code: 831250, H2020, 2019-2020.

Ready2Go International, PROMOS, Italia, Grant Agreement no. 760 / 21.03.2018, 2018.

MARKET-IT – „Demonstrating the Industrial Validity and Market Feasibility of IT Tool to Support SMEs in Systematic Innovation Processes”, Project FP7, Code: 311517, Call FP7-SME-2011, 2012-2014.

Scale-Up Transylvania: code: 764354, COSME, 2017-2018.

Study on Circular Economy Principles in SMEs from the Danube Region in: Mobilising Institutional Learning for Better Exploitation of Research and Innovation for the Circular Economy, code: MOVECO, DTP1-1-349-1.1, 2018.

CRONOS, „Consolidation of the Innovation Ecosystem of Cluj IT by Smart Specialization towards Structural Transformation and Internationalization based on IP”, PN-III-P2-2.1-CLS-2017-0041, 2018-2020.

Design and Development of a Package of Mobile Apps for Quality Reporting, Product Improvement and Safety Interventions, CSi Industries B.V. Holland, 2016-2018.

Innovation Management System design to Meet SR CEN TS 16555 Requirements, no. 72/ 28.12.2018, PRODIMA, 2018-2019.

Digitalization Strategy for Cluj County, Consiliul Judetean Cluj, no. 21.127/ 184 / 20.06.2018, 2018-2019.

Improving Key Production Process Performances Using Advanced “Lean” Tools, Nova Grup, 57/27.01.2016, 2016-2019.

Integrated Innovation Management Systems for SMEs, PNIPTPCA201341319, 2014-2017.

Active Perception Techniques for Flexible Manipulation of Objects in Smart Factories, BG, PN-III-P2-2.1-BG-2016-0140, 2016-2018.

ICT Clusters' Sustainable Cooperation for Smart and Inclusive Growth, START, DANUBE ICT - 17_PA08-C2, 2015-2016.

Innovative Design of the Security Fences for Fast Assembly and Installation, CSi Industries B.V. Holland, Grant Agreement no. 28343/10.11.2015, 2015-2016.

Expert System for Smart Robots, CSi Industries B.V. Holland, Code 2013111901, 2013-2016.

Smart Redesign of Clamp-Hook Tool to Achieve a Mass Reduction with 70%, CSi Industries B.V. Holland, 2013111902, 2013-2014.

Geiger Cybersecurity Counter, GEIGER, code: 883588, H2020-SU-DS-2019, 2020-2022.

Conception, Design and Optimization of a Connected Smart Equipment for Sublimation of Benzoic Acid from Styra Resins, Plant Extrakt, 2366/28.01.2020, 2020.
Design and Optimization of a Underground Waste Collection System, Sky-Park, 6135/08.03.2019, 2019.

Significant results

The most representative publications of the past 5 years:

1. Brad, S., *TRIZ to Support Creation of Innovative Shared Value Business Initiatives*, in: Advances and Impacts of the Theory of Inventive Problem Solving, 101-112, Springer, ISBN 978-3-319-96531-4, <https://doi.org/10.1007/978-3-319-96532-1>, 2018.
2. Brad, S., Brad, E., *Quantifying and Leading Innovation with TRIZ within Competitiveness Strategies*, in: Advances and Impacts of the Theory of Inventive Problem Solving, 65-74, Springer, ISBN 978-3-319-96531-4, <https://doi.org/10.1007/978-3-319-96532-1>, 2018.
3. Brad, S., Murar, M., Brad, E., *Design of Smart Connected Manufacturing Resources to Enable Changeability, Reconfigurability and Total-Cost-of-Ownership Models in the Factory-of-the-Future*, International Journal of Production Research, 56 (6), 2018, 2269-2291, 10.1080/00207543.2017.1400705.
4. Brad, S., Brad, E., *Directed Innovation of Business Models*, International Journal of Management, Knowledge and Learning, 5(1), 97-119, 2016.
5. Brad, S., Murar, M., Brad, E., *Methodology for Lean Design of Disruptive Innovations*, Procedia CIRP, Elsevier, 50(2016), 153-159, 2016.
6. Brad, S., Mocan, B., Brad, E., Fulea, M., *Environmentally Sustainable Economic Growth*, Amfiteatru Economic, 18(42), 446-460, 2016.
7. Brad, S., Drăghici, A., *Lean Agile Technology Transfer Approach*, International Journal of Sustainable Economy, 8(3), 224-236, 2016.
8. Brad, S., Mocan, B., Brad, E., Fulea, M., *TRIZ to Support Blue-design of Products*, Procedia CIRP, 39 (2016), 125-131, 2016.
9. Brad, S., Mocan, B., Brad, E., Mocan, M., *Economic Development of Peripheral/Lagging Zones through Smart Innovation*, International Journal of Transitions and Innovation Systems, 4(3/4), 201-220, 2015.
10. Chioreanu, A., Brad, S., Porumb, C., Porumb, S., *E-Maintenance Ontology-Based Approach for Heterogeneous Distributed Robotic Production Capabilities*, International Journal of Computer Integrated Manufacturing, Taylor & Francis, DOI: 10.1080/0951192X.2014.880802, 28(2), 200-212, 2015.
11. Brad, S., Murar, M., *Employing Smart Units and Servitization towards Reconfigurability of Manufacturing Processes*, Procedia CIRP, Elsevier, 30 (2015), 498-503, 2015.
12. Brad, S., Mocan, B., Brad, E., Fulea, M., *Leading Innovation to Improve Complex Process Performances by Systematic Problem Analysis with TRIZ*, Procedia Engineering, 131(2015), 1121-1129, Elsevier, 2015.
13. Brad, S., Brad, E., *Enhancing SWOT Analysis with TRIZ-based Tools to Integrate Systematic Innovation in Early Task Design*, Procedia Engineering, 131(2015), 616-625, Elsevier, 2015.
14. Murar, M., Brad, S., Fulea, M., Chis, I., Craciun, S., *Industrial Equipment Enhancement Using Cyber Physical Systems Towards Smart Equipment*, 2016 International Conference on Production Research, 347-354, 2016.

Technologies:

- innDrive eXXplorer: expert system for assessing innovations
- inovex : software platform for supporting knowledge management and process innovation (TRIZ-M; ARIZ-M)
- MARKET-IT: web application of advanced web semantic technologies to support the innovation processes in SMEs

Patents:

Brad, S., Murar, M., *Intelligent Automation System Based on a Distributed, Reconfigurable and Adaptive Architecture*, EPO Patent app. no. 13465501.8-1807, UTC-N.

The offer addressed to the economic environment

Research & development	Industry 4.0, mechatronic products and systems, disruptive product design, lean robotics, AI/data analytics in industrial production, AI in robotics, customized robotic system design, robotics for special applications/services, collaborative robots, green/blue-design and circular economy, production robotization
Consulting	Innovation management systems, digital transformation of businesses, scaling-up of businesses, business internationalization, assessment of innovations, smart specialization of businesses, lean and agile management, servitization of businesses, collaborative innovation, IP valuation, technology transfer
Training	<i>Management:</i> innovation management, product management, project management, contract negotiation and management, business model innovation, entrepreneurial plan development, inventive problem solving in management, competitive engineering of new products and services <i>Engineering:</i> robot programming (ABB, Fanuc, Motoman, Kuka), tools for innovation engineering, PLC programming and TIA portal, I-IoT, programming of social robots, offline robot programming and computer aided robotics

MICRO - NANO SYSTEMS LABORATORY

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Areas of expertise

Micro & Nano -systems
Micro & Nano -mechanics
Micro & Nano -tribology
MEMS & NEMS, Microstructures and materials
Adhesion, Friction, Fatigue, Reliability Design and Optimization

Team

Prof. Dr. Eng. Marius Pustan, Prof. Dr. Eng. Corina Birleanu, Prof. Dr. Eng. Cristian Dulescu, Dr. Eng. Violeta Merie, Math. Florina Maria Rusu, Eng. Radu Chiorean, Dr. Eng. Horea Crisan, PhDs Ionut Maries

Representative projects

MatSpaceTEG, “High Performance Materials for the next generation Space Thermoelectric Generators”, Romanian Space Agency (STAR) 193/15.09.2017, 2017-2019
ROMECS, Fabrication of a MEMS switch with robust metal contact, PN-III-P2-2.1-PED-2016-1727, (2016-2018)
multiDOF, “Advanced Design of micromembranes with multiple degrees of freedom for optical MEMS applications”, PN-II-RU-TE-2014-4, 2015-2017
ROBOGRIP, “Microgrippers as end-effectors with integrated sensors for microrobotics applications” MANUNET ERA-NET 22/ 2016, 2016-2018
NARDEMS, “Nano mechanical and Nano tribological characterizations for reliability design of MEMS resonators”, PNII-RU-TE-2011, 2011-2014
3SMVIB, “3 Scale modeling for robust-design of vibrating micro sensors”, ERA Net, 2012-2015
REDEMS, “Reliability design of RF-MEMS switches for space applications, The Research, Development and Innovation Space Technology and Advanced Research”, Romanian Space Agency (STAR), 2012-2015
MEMSMAT, “Tribomechanical Characterization of MEMS Materials for Space Applications under harsh environments”, Romanian Space Agency (STAR), 2013 – 2016

Significant results

The most representative publications of the past 5 years:

1. M Pustan, C Birleanu, V Merie, S Garabagiu, D Marconi, L Barbu-Tudoran, R Voicu ” Thermal effect on mechanical properties of titanium oxide thin films for thermoelectric applications”, Symposium on Design, Test, Integration and Packaging of MEMS/MOEMS, DTIP 2019 – IEEE, 2019
2. C Birleanu, M Pustan, V Merie, MS Pop „Temperature Effect on Tribo-Mechanical Properties of Dental Materials”, 6th International Conference on Advancements of Medicine and Health Care through, Springer, Singapore, 2019
3. A Baracu, R Muller, R Voicu, C Tibeica, A Dinescu, M Pustan, C Birleanu „Microfabrication and experimental characterization of an out-of-plane MEMS switch”, Romanian Journal of Information Science and Technology, 22/2, pp 124-134, 2019
4. C Birleanu, M Pustan, F Serdean, V Merie, S Craciun „Temperature effect on pull-off force for gold cantilevers array”, IOP Conference Series: Materials Science and Engineering, 499/1, 2019
5. C Birleanu, M Pustan, M Merie, H Crisan „Effect of film thickness on the tribo-mechanical properties of chrome-gold thin films”, Proceedings of the Romanian Academy Series A – Mathematics, Physics, Technical Science, Information Science, 20/ 2, pp 174-183, 2019
6. F Şerdean, M Pustan, V Merie, C Birleanu, H Crişan „ Analysis of humidity influence on adhesion and tribological properties of niobium nitride thin films”, IOP Conference Series: Materials Science and Engineering, 499/1, 2019

7. V Merie, M Pustan, G Negrea, C Birleanu, F Șerdean „Temperature effect on the mechanical characteristics of niobium nitride thin films”, IOP Conference Series: Materials Science and Engineering, 499/1, 2019
8. C Birleanu, M Pustan, F Rusu, C Dudescu, R Muller, A Baracu A. „Relative humidity influence on adhesion effect in MEMS flexible application”, Journal Microsystem Technologies, Micro- and Nanosystems Information Storage and Processing Systems, ISSN: 0946-7076 (Print) 1432-1858 (Online), 2018
9. M Pustan, C Birleanu, C Dudescu, JC Golinval “Dynamical Behavior of Smart MEMS in Industrial Applications”, in book Smart sensors and MEMS: Intelligent devices and microsystems for industrial applications, Edited by S Nihtianov and A L Estepa, Woodhead Publishing Series in Electronic and Optical, 2017
10. M Pustan, C Dudescu, C Birleanu, F Rusu “Nanocharacterization of the Mechanical and Tribological Behavior of MEMS Micromembranes”, Book chapter in Nanomechanics, book edited by Intech, ISBN 978-953-51-3182-3, Print ISBN 978-953-51-3181-6, Published: May 24, 2017 under CC BY 3.0 license. 2017
11. V Merie, M Pustan, G Negrea “Atomic force microscopy analyses on metallic thin films for optical MEMS”, 5th International Conference on Powder Metallurgy and Advanced Materials, Book Series: Materials Research Proceedings, 8, pp 125-133, 2018
12. M Pustan, C Birleanu, C Dudescu “Nanocharacterization of the adhesion effect and bending stiffness in optical MEMS”, APPLIED SURFACE SCIENCE, 421, pp 191-199, 2017
13. M Pustan, R Chiorean, C Birleanu, Corina et al. “Reliability design of thermally actuated MEMS switches based on V-shape beams”, Microsystem Technologies-Micro-and Nanosystems-Information Storage and Processing Systems, 23/ 9, pp 3863-3871, 2017
14. M Pustan, C Dudescu, C Birleanu “Influence of the excitation modes on the resonators quality factor”, Romanian Journal of Information Science and Technology, 20/ 4, pp 342-353, 2017
15. C Birleanu, M Pustan, R Müller, C Dudescu, V Merie, R Voicu, A Baracu “Experimental investigation by atomic force microscopy on mechanical and tribological properties of thin films”, Int. J. of Mat. Res., 107, pp. 429 – 438, 2016
16. M Pustan, C Dudescu, C Birleanu “The effect of sensing area position on the mechanical response of mass-detecting cantilever sensor”, Microsystems Technologies, 21/ 9, pp 1827-1834, 2015.
17. M Pustan, C Dudescu, C Birleanu “Nanomechanical and nanotribological characterization of a MEMS micromembrane supported by two folded hinges”, Analog Integrated Circuits and Signal Processing, 82/ 3, pp 627-635, 2015
18. R Voicu, M Pustan, C Birleanu, A Baracu, R Muller “Mechanical and tribological properties of thin films under changes of temperature conditions”, Surface and Coatings Technology, 271, pp 48-56, 2015
19. F Rusu, M Pustan, C Birleanu, R Muller, R Voicu, A Baracu “Analysis of the surface effects on adhesion in MEMS structures”, J. Applied Surface Science, 358 Part B, pp 634-640, 2015
20. V Merie, M Pustan, G Negrea, C Birleanu “Research on titanium nitride thin films deposited by reactive magnetron sputtering for MEMS applications”, J. Applied Surface Science, 358 Part B, pp 525-532
21. C Birleanu, M Pustan M. “Analysis of the adhesion effect in RF-MEMS switches using atomic force microscope”, Analog Integrated Circuits and Signal Processing, 82/ 3, pp 571-581, 2015.

Significant solutions:

Development of a new method to estimate the stiffness of micro/ nano -flexible structure by atomic force microscope
 Experimental determination of the energy dissipation in oscillating structure in order to increase the lifetime of vibrating sensors
 Design-Fabrication-Testing of reliable mass-detection sensors
 Design-Fabrication-Testing of micromembranes with high flexibility
 Software development for lifetime estimation of vibrating MEMS structures
 Advance nano-investigations of dental materials

Products and technologies:

Micromembrane from optical and RF applications
 Paddle MEMS cantilevers for mass detection
 Electrostatically actuated resonator
 MEMS Software Development

The offer addressed to the economic environment

Research & development	- Micro and Nano - Systems - Micro and Nano - Tribology - Micro and Nano - Mechanics Team members have great knowledge in: reliability design of micro and Nano systems, Nano /micro / macro tribological characterizations, experimental mechanics, material testing and numerical simulations. Due to a close collaboration with the productive sector, the research team is capable of collaboration with various industrial partners and research institutes. Already the laboratory is involved in collaborations with industrial partners, universities and research institutes from Romania, Belgium, Poland, Italy and France.
Consulting	Consulting in any of the above mentioned fields can be done.
Training	The members of the team have a vast experience in the educational field (academics). Also, the team has experience in the development of the professional formation and reorientation trainings for engineers in the field of Micro and Nano system design, advance testing at Micro & Nano devices.

RAPID PROTOTYPING LABORATORY

Contact details

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Acronym	FARAP
Logo	
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Telephone	+40 264 415653
Fax	+40 264 415653
Director	Prof. Dr. Eng. Petru Berce
e-mail	Petru.Berce@tcm.utcluj.ro



Areas of expertise

Industrial Engineering (Rapid Prototyping of complex parts and master models for Rapid Tooling)

CAD/CAM Systems

Biomedical engineering (Prototypes, customized implants, new biocompatible materials)

Team

Prof. Dr. Eng. Petru Berce, Prof.dr.ing. Nicolae Balci, Assoc. Prof. Dr. Eng. Răzvan Păcurar, Assoc. Prof. Dr. Eng. Mihai Damian, Assoc. Prof. Dr. Eng. Cristian Caizar, Assist. Prof. Dr. Eng. Horea Chezan, Assist. Prof. Dr. Eng. Dan Leordean, Assist. Prof. Dr. Eng. Radu Sever Adrian, Assist. Prof. Dr. Eng. Anuța Păcurar

Representative projects

OP3MET, "Optical 3D Metrology - Automated in-line metrology for quality assurance in the manufacturing industry", European FP6 Project, (2006-2008)

Adm-ERA, "Reinforcing Additive Manufacturing research cooperation between the Central Metallurgical Research and Development Institute and the European Research Area", European FP7 Project, (2011-2013)

BIOMAPIM, "New Biocompatible Materials for personalized implants made by SLS and SLM", PCCE, (2010-2013)

"Innovative Manufacturing Network", (2005-2008)

"AMaTUC - Boosting the scientific excellence and innovation capacity in additive manufacturing of the Technical University of Cluj-Napoca", HORIZON 2020 - twinning, 2016-2018

Significant results

The most representative publications of the past 5 years:

1. Miron-Borzan, Cristina Stefana; Sabau, Emilia; Mera, Mircea; et al., Research Regarding the Manufacturing through AM Technologies of an Implant for Cervical Disc Replacement MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 02008 Published: 2017
2. Rus, Alexandru; Leordean, Vasile-Danut; Berce, Petru, Silver Nanoparticles (AgNP) impregnated filters in drinking water disinfection MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 07007 Published: 2017
3. Rusu, Mircea A.; Leordean, Dan; Cosma, Cosmin; et al., Characterization polyethylene terephthalate nanocomposites mixing with nano-silica and titanium oxide MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 08005 Published: 2017
4. C. S. M. Borzan, M. C. Dudescu, V. Ceclan, A. Trip, M. Ridzon, and P. Berce, "PA 2200 vs. PMMA: Comparison Between the Mechanical Properties Obtained for the 2 Biocompatible Materials", *Materiale Plastice*, vol. 53, pp. 1-5, Mar 2016

5. Petru Berce, et. al., „Medical applications of Additive Manufacturing technologies”, *Romanian Academy Publishing House*, Bucharest, 2015
6. Leordean, Dan; Dudescu, Cristian; Marcu, Teodora; P. Berce et al., “Customized implants with specific properties, made by selective laser melting”, *RAPID PROTOTYPING JOURNAL* Volume: 21 Issue: 1 Pages: 98-104, Published: 2015
7. Leordean, Dan; Radu, S. A.; Fratila, D.; P. Berce, “[Studies on design of customized orthopedic endoprotheses of titanium alloy manufactured by SLM](#)” *INTERNATIONAL JOURNAL OF ADVANCED MANUFACTURING TECHNOLOGY*, Volume: 79 Issue: 5-8 Pages: 905-920 Published: JUL 2015
8. Petru Berce, et.al., „Additive Manufacturing Technologies and their applications”, *Academy Publishing House*, Bucharest, 2014.
9. Brie, Ioana-Carmen; Soritau, Olga; Dirzu, Noemi; P. Berce et al., “[Comparative in vitro study regarding the biocompatibility of titanium-base composites infiltrated with hydroxyapatite or silicitanate](#)”, *JOURNAL OF BIOLOGICAL ENGINEERING* Volume: 8 Article Number: 14 Published: JUN 19 2014
10. R. Păcurar, P. Berce, "Research on the durability of injection molding tools made by selective laser sintering technology", in *Proceedings of the Romanian Academy series A-mathematics physics technical sciences information science*, vol. 14, no. 3, pp. 234-241, 2013.
11. Todea, M.; Vanea, E.; Bran, S.P. Berce; et al., “[XPS analysis of aluminosilicate microspheres bioactivity tested in vitro](#)”, *APPLIED SURFACE SCIENCE* Volume: 270 Pages: 777-783 Published: APR 1 2013
12. R. Păcurar, P. Berce, "Research on How Lens Position of the Optical System is Influencing the Mechanical Characteristics of the Metallic Parts Made by Selective Laser Melting Equipment", in *Interdisciplinary research in engineering: steps towards breakthrough innovation for sustainable development*, vol. 8-9, pp. 285-292, 2013.

The offer addressed to the economic environment

Research & development	Develop new materials, suitable for Rapid Prototyping using the SLS and SLM equipment. Rapid Prototyping using the well known CNC machines, available within DME-TUCN
Consulting	Select the optimal RP technological route
Training	Training for people from industry, in the following fields: - Using the modern RP equipment; - CNC machining; - Metrology and Quality Engineering.

DASSAULT SYSTÈMES SOLUTIONS CENTER

Contact details

Name	Dassault Systèmes Solutions Center
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Areas of expertise

The main focus of the center is **Digital Product and Production Design Development and Simulation** based on the following topics:

CAD/CAM/CAE – the center is the first Dassault Systèmes academic partner from Romania and offers solutions in the fields of computer aided design, as well as modelling and simulation of products and manufacturing systems.

Reverse engineering and digitization –with interdisciplinary applications in: innovative product development, digital archaeology and reconstruction of history, medical prosthetics and others.

Virtual and augmented reality – complex computer-generated 3D environments that allow users to access and interact with an alternative reality. Users are able to interact with 3D models, in a proportion 1:1 or bigger overview of complex assembly parts and conduct virtual inspections, pick apart parts and break them down to its individual components for measurement, inspection, ergonomics, etc.

Team

Prof. Dr. Eng. Daniela Popescu, Prof. Dr. Eng. Mircea Galiş, Prof. Dr. Eng. Călin Neamţu, Lect. Dr. Eng. Florin Popișter, Assist. Dr. Eng. Rareş Ghinea, Assist. Dr. Eng. Radu Comes, Dr. Eng. Buna Zsolt, Dr. Eng. Ionuț Badiu, Eng. Sabau Radu, Eng. Zabala Ioan

Representative projects

IDArt – “Elaborating Complex Methodologies Regarding the Attribution and Authentication of Medieval and Early Modern Paintings Belonging to the National Cultural Heritage”, PNIII-P1-1.2 PCCDI 2018, (2018-2020)

DACIT, “The conservation and revitalisation of cultural and natural heritage, When ancient everyday life becomes UNESCO heritage. The scanning, digital restoration and contextualization of Dacian artefacts from Orăştie Mountains”, EEA grants - PA16/RO12, (2015-2016)

CAD/CAM/CAE, projects contracts with industrial partners Comelf SA, Turdeana SA, RAAL SA, Robert Bosch SRL, Continental Automotive Romania, Elcom Cablaje, Leoni Wirings System Romania, etc.

NoGAP, “Knowledge Transfer Community to bridge the gap between research, innovation and business creation”, European FP7 project, (2013-2016)

“Digitizing and reconstructing the historic artifacts from the “Grădiştea de munte” archaeological site (Sarmisegetuza Regia)”, The National Museum of History of Transylvania, (2012)

“Blended learning course on Measurement Uncertainty for advanced vocational training”, Leonardo da Vinci - Transfer of Innovation, (2011-2013)

“Realizing a virtual museum for promoting the patrimony of The National Museum of History of Transylvania”,

The National Museum of History of Transylvania (2010)

“Project concerning research on new product design, development and simulation”, HAMK Univ. Finland , (2007-2009)

“Scanning and generating surfaces for a orthopedic prosthesis”, SC Gibas CNC East Europe SRL, (2008)

Significant results

The most representative publications of the past 5 years:

1. Neamtu, Calin; Marutoiu, Victor Constantin; Bratu, Ioan; et al., Multidisciplinary Investigation of the Imperial Gates of the 17th Century Wooden Church in Salisca, Cluj County, Romania SUSTAINABILITY Volume: 10 Issue: 5 Article Number: 1503 Published: MAY 2018
2. Todorovic, Oliver; Constantinescu, Carmen; Popescu, Daniela, FOUNDATIONS FOR ECONOMIC EVALUATION OF EXOSKELETONS IN MANUFACTURING, ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 3 Special Issue: SI Pages: 221-230 Published: SEP 2018
3. Popescu, D.; Dragomir, M.; Popescu, S.; et al., FROM SMART PRODUCTS TO SMART MANUFACTURING IN EMERGING ECONOMIES: CHALLENGES AND INSIGHTS FROM THE FURNITURE INDUSTRY 24TH INTERNATIONAL CONFERENCE ON PRODUCTION RESEARCH (ICPR) Book Series: DEStech Transactions on Engineering and Technology Research Pages: 93-97 Published: 2017
4. Bratu, I.; Siluan, Monk; Marutoiu, C.; et al., Science Applied for the Investigation of Imperial Gate from Eighteenth Century Wooden Church of Nicula Monastery JOURNAL OF SPECTROSCOPY Article Number: 6167856 Published: 2017
5. Măruțoiu, C., I. Bratu, L. Troșan, C. Neamtu, V. C. Măruțoiu, D. Pop, C. Tănăsolia, and S. Garabagiu. "Scientific investigation of the Imperial Gates belonging to the wooden church from Săcel, Turda County, Romania." *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 152 (2016): 311-317.
6. C. Marutoiu, L. Nica, I. Bratu, O. F. Marutoiu, Z. Moldovan, C. Neamtu, et al., "The Scientific Investigation of the Imperial Gates Belonging to Sanmihailul Almasului Wooden Church (1816)," *Revista De Chimie*, vol. 67, pp. 1739-1744, Sep 2016.
7. C. Radu, C. Neamtu. "Design a low-cost eyewear display adapted to additive manufacturing." *Acta Technica Napocensis-Series: Applied Mathematics, Mechanics, and Engineering*, 58, no. 4 (2015).
8. D. Popescu, F. Popister, S. Popescu, C. Neamtu, and M. Gurzau, "Direct toolpath generation based on graph theory for milling roughing", *Procedia CIRP*, 25, 2014, pp.75-80.
9. D. Popescu, S. Popescu, C. Neamtu, "Framework for increasing adequacy of simulation software in training CMM specialists", in *10th CIRP International Conference on Computer Aided Tolerancing*, pp. 243-250
10. D. Popescu, S. Popescu, C. Neamtu, D. Mihai, "Model for developing design of the electronic courses" in *IEEE International Conference Automation, Quality and Testing, Robotics*, pp. 483-488

Significant solutions:

Measurement uncertainty evaluation in case of classical measurements hand tools for length

Mold Design for injected plastic part

Reverse engineering of mechanical parts

Terrestrial laser scanning

Products and technologies:

Virtual reality application for museum

Augmented reality application for measurement

Others:

Neamtu Călin, Popescu Daniela, Popișter Florin, *Module CAD/CAM în Catia V5*, Editura Mega, Cluj-Napoca, 2013

Neamtu Călin, Dragomir Mihai, Popescu Daniela, Popescu Sorin, Răcăsan Radu *Uncertainty of conventional measurements / Incertitudinea de măsurare în metrologia clasică*, Editura UT PRESS, Cluj-Napoca, 2012

Wojciech Płowucha (ed.) et al. – *Didactics of Coordinate Metrology*, Editura Wydawnictwo naukowe Akademii Techniczno-Humanistycznej W Bielsku-Białej, - Bielsko Biala 2012, - capitolul Virtual Laboratory, autori: Călin Neamtu, Mihai Dragomir, Daniela Popescu, Rareș Ghinea

The offer addressed to the economic environment

Research & development	Virtual reality in training and education; E-education; Designing and optimization of products and industrial manufacturing systems; Reverse engineering; Digital Archaeology; Research in the field of Digital Factory simulations; Research on adapting the reverse engineering techniques in various interdisciplinary fields (art, medicine, etc.) Reverse engineering and reconstruction of complex surfaces Designing, modelling and 3D simulating of manufacturing systems 3D modelling of components and complex assemblies
Consulting	Consultancy regarding the optimization of CAD/CAM processes; Consultancy regarding production planning; Consultancy regarding advance 3D modelling; Consultancy in virtual simulation
Training	CAD/CAM/CAE: using the Dassault Systèmes software packages Training on various topics with the help of virtual reality Advanced reverse engineering technique, 3D Shet metal design, Measurement Uncertainty

QUALITY ENGINEERING AND MANAGEMENT RESEARCH CENTER

Contact details

Name	Quality Engineering and Management Research Center
Acronym	QEMRC
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Site	http://qemrc.utcluj.ro
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Areas of expertise

Quality management and engineering - Interdisciplinary research area, with applicability in industry, in the service sector and in the public sector (education, health, administration) for improving products/services, processes and organizations

Quality and sustainability-oriented development - applying specific algorithms, techniques and methods for developing products/services, processes and organizations to meet current and future market needs and environmental challenges

Industrial metrology - high precision 3D measurement and scanning in industrial engineering; 3D surface scanning for reverse engineering and interdisciplinary applications

Team

Prof. Dr. Eng. Sorin Popescu, Assoc. Prof. Dr. Eng. Mihai Dragomir, Prof. Dr. Eng. Liviu Crişan, Assoc. Prof. Dr. Eng. Dan Hurgoiu, Sen. Lect. Dr. Diana Dragomir, Sen. Lect. Dr. Ştefan Bodi, Sen. Lect. Dr. Grigore Pop, Sen. Lect. Emilia Câmpean, and other collaborators as well as PhD students.

Representative projects

Made in Danube (MiD) - Transnational Cooperation to transform knowledge into marketable products and services for the Danubian sustainable society of tomorrow, Interreg - Danube Transnational Programme, DTP1-1-072-1.1, (2017-2019)

Smart Factory Hub (SFH) - Improving RD and business policy conditions for transnational cooperation in the manufacturing industry, Interreg - Danube Transnational Programme, DTP1-1-071-1.1, (2017-2019)

GPS-VToolbox - Geometrical Product Specification and Verification as toolbox to meet up-to-date technical requirements, Erasmus+ Programme Key Action 2 - Strategic Partnership Projects, (2015-2018)

DACIT - When ancient everyday life becomes UNESCO heritage. The scanning, digital restoration and contextualization of Dacian artefacts from Orăştie Mountains, EEA grants - PA16/RO12, (2015-2016)

NoGAP - Knowledge Transfer Community to bridge the gap between research, innovation and business creation, EU, Programme "Capacities", FP7-INCO-2013-9 R2I-ENP, project no. 609531 (2013-2016)

Significant results

Representative publications of the past 5 years:

Articles in journals and international conference proceedings:

1. Popescu S., Rusu D., Dragomir M., Popescu D., Nedelcu Ș., Competitive Development Tools in Identifying Efficient Educational Interventions for Improving Pro-Environmental and Recycling Behavior, Int. Journal of Environmental Research and Public Health, 17(1):156, 2020, <https://doi.org/10.3390/ijerph17010156>, Web of Knowledge Q1 journal
2. Weckenmann A., Bodi Ș., Popescu S., Dragomir M., Hurgoiu D., Comes R., Hit or Miss? Evaluating the Potential of a Research Niche: A Case Study in the Field of Virtual Quality Management, Sustainability, vol. 11, issue 5, p. 1450, 2019, <https://doi.org/10.3390/su11051450>, Web of Knowledge Q2 journal
3. Dragomir M., Popescu S., Neamțu C., Dragomir D., Bodi Ș., Seeing the Immaterial: A New Instrument for Evaluating Integrated Management Systems' Maturity, Sustainability, vol. 9, issue 9, p. 1643, 2017, ISSN 2071-1050, <https://doi.org/10.3390/su9091643>, Web of Knowledge Q2 journal
4. Popescu D., Dragomir M., Popescu S., Neamțu C., From Smart Products to Smart Manufacturing in Emerging Economies: Challenges and Insights from the Furniture Industry, 24th International Conference on Production Research (ICPR), Poznan, Poland, 30 July - 3 August, 2017, Book Series: DEStech Transactions on Engineering and Technology Research, Pages 93-97, 2017
5. Teleabă F., Popescu S., Santa R., Managing Quality Perception Along the Customer Journey: A Behavioral Economics Approach. In: Durakbasa N., Gençyılmaz M. (eds) Proceedings of the International Symposium for Production Research 2019. ISPR 2019, ISPR 2019. Lecture Notes in Mechanical Engineering. Springer, Cham, 2020, indexed in Springer Link
6. Dragomir D., Câmpean E., Pop G., Dragomir M., Ambroš I., Designing a toolkit for process improvement in an engineering services start-up, Proceedings of the 6th Review of Management and Economic Engineering Internat. Conference, Cluj-Napoca, Sept. 2018, pp. 448-452, indexed in ISI Conference Proceedings
7. Rusu D., Popescu S., Dragomir M., Popescu D., A Structured Managerial Model for the Decision Making Process for Enhancing Building Sustainability in all Life Cycle Phases, Procedia - Social and Behavioral Sciences, Volume 238, Pages 442-451, 2018, ISSN 1877-0428, journal indexed in ScienceDirect
8. Bodi Ș., Comes R., Weckenmann A., Popescu S., Assistive Augmented Environment in Quality Inspection and Statistical Process Control, International Conference on Production Research - Africa, Europe and the Middle East (ICPR-AEM) / 4th International Conference on Quality and Innovation in Engineering and Management (QIEM), Cluj Napoca, Romania, July 25-30, 2016, Pages 493-498, 2016

Books / chapters:

1. Dragomir Mihai, Iamandi Oana, Bodi Ștefan, Gohla Robert, Chiran Daniela, Innovation Management & Transnational Partnership. Training for SMEs and Start-Ups/Entrepreneurs - Handbook, ISBN 978-3-95663-013-2, Steinbeis-Edition Publishing house, Stuttgart, 2014 (168 pages) (English-Russian)
2. Dragomir Diana, Dragomir Mihai, Acs Daniel, Popescu Sorin, International Cooperation for Smart and Sustainable Agriculture, Chapter in "Sustainability assessment at the 21st Century", IntechOpen, DOI: 10.5772/intechopen.86464. <https://www.intechopen.com/online-first/international-cooperation-for-smart-and-sustainable-agriculture>, 2019
3. Popescu Daniela, Dragomir Diana, Comes Radu, Popescu Sorin, Dragomir Mihai, Neamțu Călin; Enhancing Management and Marketing in Cultural Heritage by Using New Technologies, Trivent Publishing, <https://www.trivent-publishing.eu/books/romanianmanagementstudies/2.%20Daniela%20Popescu%20et%20al..pdf>, Chapter in "The best Romanian Management Studies", 2017-2018, ISBN 978-615-81353-5-1, pag. 20-32, 2020.

Significant solutions:

Design and development of standardized management systems
Customer and sustainability-oriented product development
Precision measurements using multiple sensor technologies
3D scanning and interdisciplinary reverse engineering

Others:

Main organizers of the International Conference series (2011 - 2012 - 2014 - 2016 - 2018 - 2021) Quality and Innovation in Engineering and Management (QIEM) Cluj-Napoca

The offer addressed to the economic environment

Research & development	Quality and sustainability-oriented product and process development Optimizing the implementation of standardized management systems High precision 3D measurement and complex 3D surface scanning
Consulting	Designing, implementing, maintaining and improving standardized management systems Consultancy on developing new products or improving existing ones
Training	Quality engineering and management Industrial metrology and 3D scanning

RESEARCH LABORATORY FOR MANUFACTURING PARTS FROM COMPETITIVE MATERIALS

Contact details

Name	Research Laboratory for Manufacturing Parts from Competitive Materials
Acronym	CoMaRLaMP (RLMPCM)
Logo	
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Industrial%20Engineering%20and%20Management/12_lancau.pdf
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Telephone	+40 264 401709
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Director	Prof. Dr. Eng. Sorin Grozav
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Areas of expertise

Composite and plastic material

- Conception, manufacturing and mechanical behavior of polymer composites, Mechanical behavior of materials at low and cryogenic temperature.

Design of cutting tools

- Cutting and cutting tools, Metalworking technology, Tools for machine tools.

Device design and maintenance

- Design devices, Technologies and equipment for reconditioning.

Processing machinery

- Forming machines, Forming Machines and technologies, Mechanization and automation of technological processes of cutting and forming, CNC machine tools.

Medical devices

- Osteosynthesis material, Intramedullary nailing

Team

Prof. Dr. Eng. Sorin Grozav, Prof. Dr. Eng. Ioan Vuscan, Prof. Dr. Eng. Marian Borzan, Prof. Dr. Eng. Liana Hancu, Assoc. Prof. Dr. Eng. Gheorghe Gligor, Assist. Prof. Dr. Eng. Adrian Trif, Assist. Prof. Dr. Eng. Paul Bere, Assist. Prof. Dr. Eng. Vasile Ceclan, Assist. Prof. Dr. Eng. Adrian Popescu

Representative projects

BELCO – “Optimizing the fiber reinforced polymer composite materials and manufacturing technology used in the producing body elements for electric vehicles”, PNIII-P2-2.1-BG-2016-0210, (2016-2018)

“3D modeling of complex surfaces” – contract with industry, (2017-2018)

“Informatics Platform for Engineering Fluid PIIF”, POSDRU, (2010-2013)

“Advanced Solutions to Improve Performance in Bending with Active Plates of Elastomer”, CNCSIS, (2009-2012)

“Development of a Computer System for Assessing of Occupational Hazards Type Mechanical Vibrations and Impact on Human Operator Workplace”, VIBROM, (2008-2011)

Significant results

The most representative publications of the past 5 years:

1. Gabriel CIUSCA, Teodor POTRA, Vasile CECLAN, Sorin GROZAV - *Determination of Field Temperature for Composite Materials using Empirical Methods*, Springer Nature Switzerland AG 2020, N.M.Durakbasa and M.G.

- Gencyilmaz(Eds.): ICPR1 2019, LNME, pp. 416-421, 2020. https://link.springer.com/chapter/10.1007%2F978-3-030-31343-2_36
2. Simona Sorina GABRIAN, Sorin-Dumitru GROZAV, Gabriel Nicodim CIUȘCĂ, Vasile, Adrian CECLAN, Antoniu TURCU and Stanislaw LEGUTKO, - *New materials obtained by rubber recycling from industrial waste*, MATEC Web of Conferences; Les Ulis Vol. 299, Les Ulis: EDP Sciences.(2019)05010(2019) <https://doi.org/10.1051/mateconf/201929905010>
 3. V Ceclan, A Popan, S Grozav, A Popan - *Study on milling strategies influence on the quality characteristics in case of composite material* - MATEC Web of Conferences; Les Ulis Vol. 299, Les Ulis: EDP Sciences. (2019) 04012 (2019) <https://doi.org/10.1051/mateconf/201929904012>
 4. Grozav, Sorin Dumitru; Ceclan, Vasile Adrian; Ciusca, Gabriel Nicodim, CALCULATION OF THE CONTACT SURFACE IN THE ORBITAL DEFORMATION OF THE CYLINDRICAL WORKPIECE ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 4 Pages: 695-700 Published: NOV 2018
 5. Ceclan, Vasile Adrian; Grozav, Sorin Dumitru; Kuric, Ivan, RESEARCH ON INNER SURFACE OF HYDROFORMED TUBES ADVANCES IN SCIENCE AND TECHNOLOGY-RESEARCH JOURNAL Volume: 11 Issue: 4 Pages: 311-317 Published: DEC 2017
 6. Grozav, Sorin-Dumitru; Ciusca, Gabriel Nicodim; Ceclan, Vasile, The lack of uniformity of the deformations and the degree of deforming in case of orbital deformation MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 05002 Published: 2017
 7. Bere P., Neamtu C., Dudescu C., Design and manufacturing front hood for electric vehicle by carbon fibber, 1st Innovative Manufacturing Engineering & Energy International Conference – IManE&E 2017, MATEC Web Conf. 112 07021 (2017), DOI: 10.1051/mateconf/201711207021
 8. Bere P, Neamtu C., Dudescu C M., Comes R., Solcan S., Carbon epoxy front hood for an electrical city vehicle, Modern Technologies in Manufacturing (MTem 2017 - AMaTUC), Volume 137, 2017, MATEC Web Conf. 137 08001 (2017), DOI: 10.1051/mateconf/201713708001
 9. Hancu L, Marc G., Popescu A, Bere P., Rodean S., Proposal for a composite structure and graphic design for a parking barrier, Modern Technologies in Manufacturing (MTem 2017 - AMaTUC), Volume 137, 2017, MATEC Web Conf. 137 08004 (2017), DOI: 10.1051/mateconf/201713708004
 10. C. S. M. Borzan, M. C. Dudescu, V. Ceclan, A. Trip, M. Ridzon, and P. Berce, "PA 2200 vs. PMMA: Comparison Between the Mechanical Proprieties Obtained for the 2 Biocompatible Materials", *Materiale Plastice*, vol. 53, pp. 1-5, Mar 2016

Products and technologies:

1. Seat passenger rail industry.
2. Industrial plant RTM for SC VRG Bistrita Company.
3. Self-locking intramedullary nail for major trauma, such as when intramedullary nailing.

Patents:

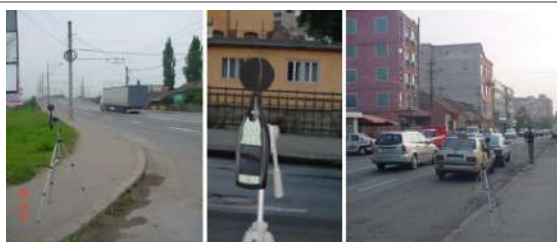
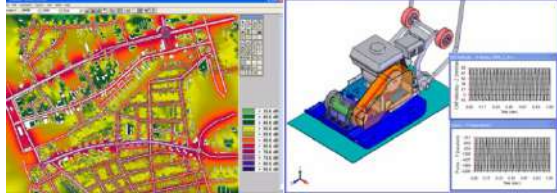
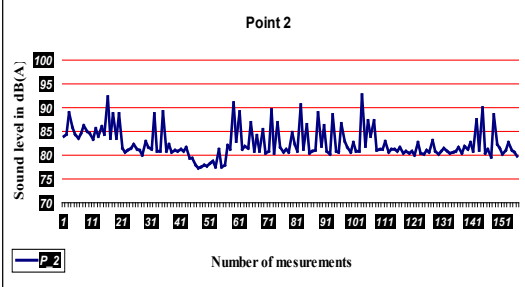
1. S. Grozav, Coste Camilio, "Self-locking intramedullary nail" patent: RO127480, 30.01.2014, Excellence Award and Gold Medal with special mention at the salon PROINVENT 2014
2. I. Vuscan - Patent: no. 123184 OSIM, 2011; Diploma of excellence and gold medal for the group of inventions PROINVENT edition a-VIII-a, Cluj-Napoca 2010; Diploma and silver medal – EUROINVENT, Iași, 2011; Diploma and medal AGEPI from the State Agency for Intellectual Property from Republica Moldova, - PROINVENT, Cluj-Napoca, 2011.
3. P. Bere, P. Berce, H. Iancau, "Method and device for obtaining bent tubular parts with variable section of fiber reinforced polymer composites", Request invention no. A 2011 1004/05.02.2011, Excellence Award and Silver Medal with special mention at the salon PROINVENT 2014

The offer addressed to the economic environment

Research & development	Study regarding the mechanical behavior of polymer composite structures. Micromechanics and mechanical of high performance composite structures. Study of phenomena that accompany the process of orbital forming metal matrix composite materials. Applied research regarding the influence of process parameters on the mechanical characteristics of composite structures. Determination of mechanical characteristics by testing tensile, compression, bending and delamination specific the composites. Experimental research regarding the manufacture of on polymer composite. Manufacturing of automotive gears by orbital forming.
Consulting	This collective provides consultancy in the field of replacing metal parts with composite structures based on fiberglass, carbon, Kevlar and so on, used in top fields such as aeronautics, aerospace and transportation.
Training	It provides training in the application materials and competitive technologies. The research structure proposed has the potential to provide economic environment training in a highly dynamic field, but relatively new in our country, as is the use of competitive material in peak areas in order to increase the quality and competitiveness of industrial products.

ACOUSTICS, APPLIED MECHANICS AND CAD RESEARCH LABORATORY

Contact details

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Areas of expertise

Acoustics

- Physical acoustics, Industrial/Environmental noise and vibration control, Urban acoustics, Bioacoustics

Applied mechanics

- Mechanical vibrations, Machine dynamics, Analytical mechanics, Computational mechanics, Biomechanics

Computer Aided Design

- Surface and solid modeling, Parametric modeling, Theoretical foundation of CAD, Mechanical drafting, CAE

Team

Prof.Dr.Eng. Diana Ioana Popescu, Prof.Dr.Eng.Math. Nicolae Ursu-Fischer, Assist. Prof. Dr. Eng. Lucia Margareta Ghiolțean, Assist.Prof.Dr.Eng. Radu-Mircea Morariu-Gligor, Assist.Dr.Eng. Luminita Molnar, Assist.Dr.Eng. Iuliana Fabiola Moholea

Representative projects

“Modelling, simulation and precision in the study of mechanical systems vibrations, with applications for crankshafts of internal combustion engines and piston compressors”, CNCSIS A41-1049, (2004-2005)
“Modelling, algorithms and precision in the study of mechanical systems vibrations”, CNCSIS A-1259, Ministry of Education and Research, (2006)
“Development of engineering models and methods for assessment and prediction of the environmental noise”, PNII-Idei, (2007-2010)
“Fundamental and applied research on the modernization of the vibrating plate compactors - design and execution”, Managerial Agency for Scientific Research, Innovation and Technological Transfer, RELANSIN, (2001-2003)
“Research and studies on perception, assessment, control and prediction of industrial noise”, CNCSIS, A33, Ministry of Education and Research, (2004-2005)

Significant results

The most representative publications of the past 5 years:

1. Popescu, D.I., “Environmental Noise in Urban Areas, between Acceptance and Taking Measures”, *18th International Conference Noise Control*, 26-29 May 2019, Janow Podlaski, Poland, Conference Proceedings on CD, Central Institute of labour Protection – CiopPib, Polish Academy of Science, ISBN 978-83-7373-273-5, 10 pag.
2. Ursu-Fischer, Nicolae; Popescu, Diana Ioana; Radu, Ioan; Moholea, I.F., “Multiple solutions of interpolation with second and third degree Bézier polynomials”, *Acta Technica Napocensis, Series: Applied Mathematics, Mechanics*

- and Engineering, Vol. 61, Issue 2, pp. 159-166, Jun 2018.
3. Ursu-Fischer, Nicolae; Popescu, Diana Ioana; Radu, Ioan, "Spline interpolation with third-degree Bézier functions", *Acta Technica Napocensis, Series Applied Mathematics, Mechanics and Engineering*, Vol. 61, Issue 2, pp. 167-174, Jun. 2018.
 4. Popescu, Diana Ioana; Ursu-Fischer, Nicolae; Moholea, Iuliana Fabiola, "Road Traffic Noise in Cluj-Napoca City – Ten Years after the First Strategic Noise Map", *Acta Technica Napocensis, Series Applied Mathematics, Mechanics and Engineering*, Vol. 60, Issue 4, pp. 515-520, Nov. 2017.
 5. Popescu, Diana Ioana; Ursu-Fischer, Nicolae; Moholea, Iuliana Fabiola, "Road Traffic Noise Reduction Strategy in Cluj-Napoca – A Brief Analysis", *Acta Technica Napocensis, Series Applied Mathematics, Mechanics and Engineering*, Vol. 60, Issue 4, pp. 521-526, Nov 2017.
 6. Morariu-Gligor, R.M., Crisan, A.V., Serdean, F.M., "Optimal Design of an One-way Plat Compactor", *Acta Technica Napocensis, Series Applied Mathematics, Mechanics and Engineering*, Vol. 60, Issue 4, pp. 557-564, Nov 2017.
 7. Morariu-Gligor, R.M., "Factors Influencing the Degree of Soil Compaction", *Acta Technica Napocensis, Series Applied Mathematics, Mechanics and Engineering*, Vol. 60, Issue 1, pp. 125-130, March 2017.
 8. Popescu, D.I., "Study of Particle Motion on a Helical Vibrating Surface", The Third International Conference of Mechanical Engineering, Faculty of Mechanics, University of Craiova, 8-9 October 2015, Proceedings on CD, *Trans Tech Publication: Current Solutions in Mechanical Engineering, Applied Mechanics and Materials*, vol. 823, pp. 13-16, Jan. 2016, DOI 10.4028/www.scientific.net/Am.823.
 9. D. I. Popescu and I. Cosma, "Traffic Noise Models for Curved Roads", *Archives of Acoustics*, vol. 41, pp. 309-314, 2016.
 10. N. Ursu-Fischer, "A Computing Method of the Positional Accuracy for The R-R-R Type Serial Robot", *Acta Technica Napocensis Series-Applied Mathematics Mechanics and Engineering*, vol. 59, pp. 259-268, Sept. 2016.
 11. N. Ursu-Fischer, I. Moholea, and I. Radu, "Contributions to the Study of the Plastic Collisions Between a Body and a Vibrating Plate", *Acta Technica Napocensis Series-Applied Mathematics Mechanics and Engineering*, vol. 59, pp. 269-272, Sep 2016.
 12. Popescu, D.I., "Teaching Computer Aided Design for Engineering Students", *Acta Technica Napocensis, Series: Applied Mathematics, Mechanics and Engineering*, vol.58, Issue III, september 2015, pp. 331-336
 13. Ghiolțean, L.M., "Considerations concerning the need of sustainable ecological design", *Journal of Industrial Design and Engineering Graphics*, Volume 10, Issue No.2-2015, București, Romania, pp.15-18, ISSN 1843-3766.
 14. Moholea, I.F., Popescu, D.I., Ursu-Fischer, N., "Contributions to the Study of the Masses Chaotic Movements of a Mechanical System", *Acta Technica Napocensis, Series: Applied Mathematics, Mechanics and Engineering*, vol.58, Issue III, 2015, pp. 435-440
 15. Popescu, D.I., "Managing the Risks of Noise Exposure at Work", *ICSV22 - The 22nd International Congress on Sound and Vibration*, Florence, Italy, 12-16 July 2015, The International Institute of Acoustics and Vibration (IIAV), Acoustical Society of Italy, Proceedings on CD: Paper Nr. 360, 6 p.
 16. Cosma, I., Popescu, D.I., "Phenomenological Modeling of Sound Field Generated by Transversal Vibrations of Strait-Lined and Cylindrical Sources", *Studia Universitatis Babes-Bolyai, Physica*, LX, 2, 2015, pp. 33-41

Books:

- Ursu-Fischer, N., Ursu M., "Metode numerice în tehnică", Casa Cărții de Știință, Cluj-Napoca, 2019
- Ursu-Fischer, N., "Elemente de mecanica analitică", Casa Cărții de Știință, Cluj-Napoca, 2015

Significant solutions:

Development of specific methods for assessment and prediction of road and railway traffic noise

Assessment of environmental and industrial noise impact on human

Solutions to improve the urban acoustic environment and reduce the exposure to noise

Noise maps

Development of models, simulations and dynamical studies of vibrating machines: vibrating compactors, elevators, feeders and mills.

The offer addressed to the economic environment

Research and development	The research team is interested in new ideas for cooperation in the field of acoustics and vibrations, for completing projects aiming the assessment, prediction and reduction of pollution.
Consulting	Consulting in the fields of: Acoustics Noise mapping Vibrations Machine dynamics Vibro-acoustic diagnostics Computer aided design and engineering graphics.
Applied engineering services	Assessment of noise and vibration Computer aided drafting, design and engineering 3D modelling
Training	CAD training courses (AutoCAD, Inventor) developed by authorised instructors of the Autodesk Authorised Training Centre in UTC-N



MANAGEMENT RESEARCH CENTER FOR ORGANIZATIONAL SUSTAINABILITY

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Telephone	+40 264 401580
Fax	+40 264 595488
Director	Prof. Dr. Eng. Ec. Laura Bacali
e-mail	Laura.Bacali@mis.utcluj.ro

Areas of expertise

Business and Management
New Marketing and Entrepreneurial Development Managerial Methods for Organizational Competitiveness

Team

Prof. Eng. Ec. Laura Bacali, Prof. Dr. Eng. Ec. Doru Farcas, Prof. Dr. Eng. Florin Lungu, Assoc. Prof. Dr. Jur. Roxana Cordos, Assoc. Prof. Dr. Emilia Ciupan, Assoc. Prof. Dr. Ec. Cristina Feniser, Assoc. Prof. Dr. Eng. Daniel Filip, Prof. Dr. Eng. Ec. Adriana Sava, Assoc. Prof. Dr. Eng. Sorin Suteu, Assoc. Prof. Dr. MsC Ec. Camelia Ucenic, Assoc. Prof. Dr. Eng. Radu Vlad, Lecturer Dr. Eng. Ec. Claudiu Abrudan, Lecturer Dr. Eng. Gabriela Bacila, Lecturer Dr. Ec. Monica Bogdan, Lecturer Dr. Eng. Simion Dan, Lecturer Dr. Eng. Violeta Firescu, Lecturer Dr. Eng. Ec. Dana Jucan, Lecturer Dr. Eng. Remus Lungu, Lecturer Dr. Eng. Carmen Muresan, Lecturer Dr. Eng. Calin Otel.

Representative projects

UNlinOI – "Knowledge Management-based Research Concerning Industry-University Collaboration in an Open Innovation Context", PN-II-PT-PCCA-2013-4-0616, (2014-2017)
"Optimal design of production systems with the help of evolutionary algorithms", PNII-Idei, <http://www.mim.utcluj.ro/ro/pages/proiecte-in-derulare/idei-id-159/> (2008-2011)
COMPRAIL – "Improving energy efficiency of freight trains, increasing railways capacity and enhancing the role of rail freight within intermodal transport through GPS systems"
<http://www.mim.utcluj.ro/ro/pages/proiecte-in-derulare/comprail/> (2008-2011)
"The use of game theory in studying organizational culture", PNII-Idei, <http://www.mim.utcluj.ro/ro/pages/proiecte-in-derulare/idei-id-158/>
"Development through neuro-fuzzy modeling of customized solutions for systems of performance indicators dedicated to sustainable competitiveness of an industrial entrepreneurial company", PNII-Idei, (2009-2011)
"Partnership for excellence in research and development of entrepreneurial skills and human capital in the knowledge and innovation based society", Partnerships in priority areas (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Bercea, Oana-Bianca; Lakatos, Elena-Simina; Bacali, Laura, Comparative Study Regarding Organizational Culture: Nonprofit Organization and Profit-Oriented Organization CIVIL SOCIETY: THE ENGINE FOR ECONOMIC AND SOCIAL WELL-BEING Book Series: Springer Proceedings in Business and Economics Pages: 41-52 Published: 2019
2. Bacali, Laura Andrada; Botos, Andreea; Lakatos, Simina Elena; et al., THE IMPORTANCE OF AMBIANCE IN ROMANIAN UNIVERSITY EDUCATIONAL SPACES ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 4 Pages: 609-616 Published: NOV 2018

3. Bacali, Laura Andrada; Botos, Andreea; Nan, Ligia Maria; et al., THE INFLUENCE OF THE ENVIRONMENTAL LEVEL ON THE PROFESSIONAL RESULTS OF THE ROMANIAN STUDENTS ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 4 Pages: 617-624 Published: NOV 2018
4. Lakatos, Elena Simina; Bacali, Laura; Ciomos, Alina Oana; et al., THE BEHAVIOUR OF NEW GENERATIONS CONSUMERS RELATED TO THE CIRCULAR ECONOMY ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 4 Pages: 727-734 Published: NOV 2018
5. Lakatos, Elena Simina; Bacali, Laura; Nan, Ligia Maria; et al., THE DEVELOPMENT OF THE PRODUCTION PROCESSES IN AN ACTIVE CIRCULAR ECONOMY SYSTEM, A VIEW OF RECIRCULATION ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 4 Pages: 735-742 Published: NOV 2018
6. Drageanu, Calin; Bacali, Laura, CONTRIBUTIONS TO THE MODELLING OF ARCHETYPES IN THE MANAGEMENT OF KNOWLEDGE WITHIN ORGANIZATIONS ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 60 Issue: 2 Pages: 269-274 Published: JUN 2017
7. Bacali, Laura; Lakatos, Elena-Simina; Naghiu, Mihai Octavian; et al., Analysis on the Impact of History on Economic Development and the Entrepreneurial Map in Romania TRANSYLVANIAN REVIEW Volume: 26 Supplement: 2 Pages: 287-297 Published: 2017
8. Potra, R., Bacali, L., Baban, C., The Importance of Knowledge Management in Universities – Companies Partnership (II), Review of Management and Economic Engineering, 16(1), 91-102, 2017.
9. Bercea, Oana Bianca, Bacali, Laura, Lakatos, Elena Simina, Dezvoltarea economică în regiunea de nord-vest a româniei – analiza shiftshare, Review of Management and Economic Engineering, 16(1), 145-152, 2017.
10. Barkoczia, Nadi; Lakatos, Elena Simina; Bacali, Laura Andrada , An innovation diffusion model for new mobile technologies acceptance MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 07001 Published: 2017
11. E. S. Lakatos, V. Dan, L. I. Cioca, L. Bacali, and A. M. Ciobanu, "How Supportive Are Romanian Consumers of the Circular Economy Concept: A Survey," *Sustainability*, vol. 8, Aug 2016.
12. Lakatos, E.S., Bercea, O.B., Moldovan, A., Bacali, L., Partnership between industry and university from an Open Innovation perspective, Review of Management and Economic Engineering, 14(1), pp. 173-182. 2015
13. Vaida, R., Bacali, L., Lakatos, E.S., Drăghici, A., Applications of knowledge management in social enterprises, Review of Management and Economic Engineering, 14(3), pp. 516-527, 2015.
14. Cantor, A., Bacali, L., Muresan, M.C. , About the role of marketing research, Review of Management and Economic Engineering, 14(4), pp. 774-785, 2015.
15. Branduşan, R., Bacali, L., Mureşan, C.M., Lakatos, E.S. , Exploratory research regarding knowledge management, Review of Management and Economic Engineering, 13(4), pp. 789-796, 2014.
16. Moldovan, E.S. Lakatos, L. Bacali, O.B. Bercea, L. Ripa, "Analysis regarding the size and dynamics of Corporate Social Responsibility concept", MANAGEMENT BETWEEN PROFIT AND SOCIAL RESPONSIBILITY Book Series: Review of Management and Economic Engineering International Management Conference, 2014, pag. 270-276.
17. Barkoczi, Nadia; Bacali, Laura; Lobontiu, Mircea, "Current status of the interferences between technology diffusion and marketing management", MANAGEMENT BETWEEN PROFIT AND SOCIAL RESPONSIBILITY Book Series: Review of Management and Economic Engineering International Management Conference Pages: 324-331 Published: 2014

The offer addressed to the economic environment

Research & development	Development of cooperation with other research groups Strategies for sustainability The elaboration and implementation of managerial systems which drive to performance on the three sustainability poles: long run economic performance, social and environmental performance Organizational development toward the learning organization
Consulting	Collaboration with the economic environment and other sectors of the social life for relevant topics regarding sustainability The transfer of the research results toward the end users Support for start-ups and innovative spinoffs Market research Business plan Feasibility studies Cost benefit analysis
Training	Training and research opportunities for PhD students Training and research opportunities for young researchers Training for economic environment Course :Integration of Management Systems Change and Learning Organization Communication Strategies Cleaner Productionm Corporate governance Business simulation games

THE CENTER FOR RESEARCH IN ENGINEERING AND TECHNOLOGY MANAGEMENT

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Areas of expertise

Applied research in industrial engineering: a) development of applications in manufacturing processes; b) development of applications in mechanical systems; c) development of applications in technology management;
Competitive and pre-competitive research: a) technological equipment; b) machinery and equipment manufacturing technology; c) special technological processes; d) optimization of the manufacturing technological system; e) monitoring technological systems and equipment; f) information technology integration into production systems (PDM, PLM etc.)
Product innovation and technological innovation in engineering and their impact on technology management
Research knowledge capitalization and dissemination

Team

Prof. Dr. Eng. Mircea Lobonțiu, Prof. Dr. Eng. Vasile Năsui, Prof. Dr. Eng. Radu Iacob Cotețiu, Prof. Dr. Eng. Nicolae Stelian Ungureanu, Prof. Dr. Eng. Adrana Cotețiu, Assoc. Prof. Dr. Eng. Mihai Bănică, Assoc. Prof. Dr. Eng. Horia Cioban, Assoc. Prof. Dr. Eng. Lucian Butnar, Assoc. Prof. Dr. Eng. Flavia Suci, Assoc. Prof. Dr. Eng. Dinu Stoicovici, Assist. Prof. Dr. Eng. Marius Cosma, Assist. Prof. Dr. Eng. Ec. Gabriela Lobonțiu, Assist. Prof. Dr. Eng. Sandor Ravai Nagy, Assist. Dr. Eng. Vlad Diciu
 Phd. student: Eng. Nicolae Medan

Representative projects

"Product Development Research Activities - Technological production lines with CAD site", contract with industry, (2013-2014)
"Increasing the capacity of institutional management for the work of CD&I in engineering and technological management", ANCS
"Study and solutions regarding the hydraulic calculations made for the treatment plants of the Fierbinți objective", SC ADISS S.A. Baia Mare, (2012)
"Competitive research activities regarding the 2+3cm multifunctional truck product and the electrical installation command of the 5mc cesspool emptier", (2011)
"Study the solutions to drive mechanical and hydraulically a sewage cleaning equipment on Renault chassis", SC Grup4 SA., SC ADISS SA., (2012)

Significant results

The most representative publications of the past 5 years:

1. Ungureanu, Nicolae Stelian; Petrovan, Adrian; Ungureanu, Miorita, Contributions to the Development of an Ontology in Logistics of Manufacturing International Conference on Manufacturing Engineering and Materials (ICMEM) Location: Novy Smokovec, SLOVAKIA Date: JUN 18-22, 2018 Book Series: Lecture Notes in Mechanical Engineering Pages: 299-306 Published: 2019
2. Ruggiero, Alessandro; D'Amato, Roberto; Calvo, Roque; Ungureanu Nicolae et al., Measurements of the Friction

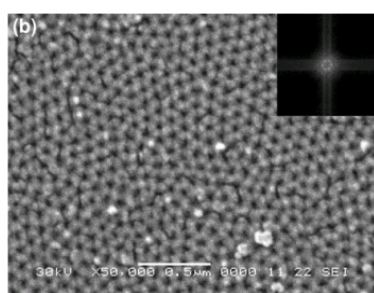
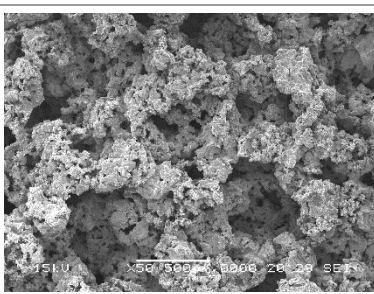
- Coefficient: Discussion on the Results in the Framework of the Time Series Analysis ADVANCES IN MANUFACTURING ENGINEERING AND MATERIALS, ICMEM 2018 Book Series: Lecture Notes in Mechanical Engineering Pages: 443-455 Published: 2019
3. Ruggiero, Alessandro; D'Amato, Roberto; Ungureanu, Nicolae, Fluid Film Pressure Description in Finite Turbulent Lubricated Journal Bearings by Using the Warner's Theory ADVANCES IN MANUFACTURING ENGINEERING AND MATERIALS, ICMEM 2018 Book Series: Lecture Notes in Mechanical Engineering Pages: 465-475 Published: 2019
 4. Nadolny, Krzysztof; Kaplonek, Wojciech; Krolczyk, Grzegorz; Ungureanu Nicolae et al., The effect of active surface morphology of grinding wheel with zone-diversified structure on the form of chips in traverse internal cylindrical grinding of 100Cr6 steel PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART B- JOURNAL OF ENGINEERING MANUFACTURE Volume: 232 Issue: 6 Pages: 965-978 Published: MAY 2018
 5. Medan, Nicolae; Lobontiu, Mircea; Banica, Mihai, Full factorial DOE to determine the influence of the process parameters in cleaning water jets used in sewer cleaning, 4th International Conference on Computing and Solutions in Manufacturing Engineering (CoSME) Location: Brasov, ROMANIA Date: NOV 03-04, 2016 Book Series: MATEC Web of Conferences Volume: 94 Article Number: UNSP 07005 Published: 2017
 6. V. Ilic, N. Jorgovanovic, A. Antic, S. Moraca, and N. Ungureanu, "A NOVEL FULLY FAST RECOVERY EMG AMPLIFIER FOR THE CONTROL OF NEURAL PROSTHESIS", *Tehnicky Vjesnik-Technical Gazette*, vol. 23, pp. 1131-1137, Jul-Aug 2016.
 7. Basarman, Adrian-Paul; Lobontiu, Mircea, Aspects regarding the surface roughness on a steel part cutted using AWJ technology 13th International Conference on Modern Technologies in Manufacturing (MTeM-AMaTUC) Location: Cluj Napoca, ROMANIA Date: OCT 12-13, 2017 MODERN TECHNOLOGIES IN MANUFACTURING (MTEM 2017 - AMATUC) Book Series: MATEC Web of Conferences Volume: 137 Article Number: UNSP 01001 Published: 2017
 8. A. Cotetiu, R. Cotetiu, N. Ungureanu, "Research about automatic adjustment solution of the advance force at the perfusion drills using fluid elements", in *Archives of Mining Sciences*, vol. 58, no. 4, 2014, pp 1201-1208
 9. G. Lobontiu, "Planned Obsolescence and the Product Lifecycle", in *Applied Mechanics and Materials*, vol. 371, 2013, pp. 857-861
 10. R. S. Nagy, M. Lobontiu, "Technological Solutions for Manufacturing Gears with Asymmetric Teeth" in *Academic Journal of Manufacturing Engineering*, vol.11, no. 3, 2013, pp. 68-73
 11. V. Diciuc, "A Comparison between the Wear of the Ball Nose End Mill generated in 4 Axes Milling and in 5 Axes Milling" in *Applied Mechanics and Materials*, vol. 371, 2013, pp. 106-110
- Products and technologies:**
1. The water treatment plants;
 2. Multifunctional truck product for sewage cleaning;
- Technologies for manufacturing of the asymmetric tooth gear.

The offer addressed to the economic environment

Research & development	Development of products and equipment needed in the field of wastewater treatment; Product development in the field of wastewater disposal and transport: multifunctional trucks, cesspool emptiers; The study of cutting tools durability for real technological conditions; The study of the machined surfaces' quality depending on the process parameters and on the cutting conditions; Studies and research activities on the mechanical parameters of the components of the industrial systems; Studies and research activities in logistics, maintenance and reliability.
Consulting	Consulting in: manufacturing technologies, product development, Technology Management, human resources issue in Engineering, logistics, maintenance and reliability, Tribology.
Training	Training courses for NCMT operators, usage, programmers; Training in CAD.

THE POROUS MATERIALS AND COMPOSITES RESEARCH GROUP

Contact details

Name	The Porous Materials And Composites Research Group	
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Logo		
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Areas of expertise

Field: Materials Science and Engineering

Expertise in Powder Metallurgy

- Sintered porous materials, cellular materials (metallic foams)
- Material metal and ceramic matrix composites produced by powder metallurgy.

Team

Assist. Prof. Dr. Eng. Gyorgy Thalmaier, Prof. Dr. Eng. Ioan Vida-Simiti, Assist. Prof. Dr. Eng. Niculina Sechel,

Representative projects

MATAVSUD: "Innovative Research on development of new materials for welding and other production processes" - CEEX Contract no. 8/2005-2008

BRONZINV "Fundamental and applied research on 12-15% tin bronzes for obtaining anti-friction layers " _ CEEX Contract No. 11/2005-2008

"Manufacturing Aluminium - Graphite composites by casting and sintering", Contract CEEX Nr.2/2005-2008

NANOGRAD "Advanced research on the development of nanostructured graded composite materials for excessive wear applications " Contract CEEX Nr.91/2006: -2008

ELSUD "Multi-layered electrodes for electrical resistance spot and line welding" Program 4 Partnerships in priority areas, PNCDI 2 - 2007-2009

ELMOD – "Innovative technologies for the development of modular manufacture of forming tools", Program 4 Partnerships in priority areas, PNCDI 2, 2007-2009

"Exploratory research projects. Studies and research on obtaining structurally graded materials by controlled sedimentation of metallic and ceramic powders" Program Ideas ID_214, no. 749 / 19.01.2009

"Development and support of multidisciplinary postdoctoral programs in priority technical areas of the national strategy for research - development - innovation 4D-postdoc" Postdoctoral research fellowship funded by the Managing Authority for Sectorial Operational Programme Human Resources Development under the project Contract Code: POSDRU/89/1.5/S/52603

Significant results

The most representative publications of the past 5 years:

1. Gy. Thalmaier, N. Cobîrzan, A.-A. Balog, H. Constantinescu, M. Streza, M Nasui, B.V. Neamtu, Influence of sawdust particle size on fired clay brick properties, *Materiales de Construcción*, accepted for publication oct. 2019
2. Thalmaier, Gyorgy; Sechel, Niculina Argentina; Vida-Simiti, Ioan, Heat Transfer Enhancement of Paraffin Phase Change Composite Material Using Recycled Aluminum Sawing Chips *JOM* Volume: 71 Issue: 3 Pages: 1049-1055 Published: MAR 2019
3. Cobirzan, Nicoleta; Thalmaier, Gyorgy; Balog, Anca-Andreea; et al., Thermophysical properties of fired clay bricks with waste ceramics and paper pulp as pore-forming agent *JOURNAL OF THERMAL ANALYSIS AND CALORIMETRY* Volume: 134 Issue: 1 Pages: 843-851 Published: OCT 2018
4. Thalmaier, Gyorgy; Vida-Simiti, Ioan; Sechel, Niculina Argentina, Influence of the palladium coating on the hydrogen embrittlement of Ni61Nb33Zr6 amorphous tapes obtained by melt spinning *POWDER METALLURGY AND ADVANCED MATERIALS* Book Series: Materials Research Proceedings Volume: 8 Pages: 89-94 Published: 2018
5. M. Bosca, L. Pop, L. Bolundut, N. Tothazan, G. Borodi, I. Vida-Simiti, et al., "Effects of Gd3+ : Ag co-doping on structural and magnetic properties of lead tellurite glass ceramics," *Ceramics International*, vol. 42, pp. 1169-1176, Jan 2016.
6. C. V. Prica, T. F. Marinca, F. Popa, N. A. Sechel, O. Isnard, and I. Chicinas, "Synthesis of nanocrystalline Ni3Fe powder by mechanical alloying using an extreme friction mode," *Advanced Powder Technology*, vol. 27, pp. 395-402, Mar 2016.
7. Gherasim, Gabriel; Thalmaier, Gyorgy; Sechel, Niculina; et al., RESEARCHES ON OBTAINING SINTERED Al80Fe10Ti10 FOAMS ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 58 Issue: 4 Pages: 585-590 Published: NOV 2015
8. S. Şuta, G. Gherasim, G. Thalmaier, N. Sechel, I. Vida – Simiti, "Ti-Al membranes for microfiltration", *Conferinta international, Advanced Materials and Structures* 16-17 October 2015, Timişoara, Romania
9. Gy. Thalmaier, N.A.Sechel, I. Vida-Simiti, "Metalurgia pulberilor - aplicații practice", Editura UTPress, 2015.

Patents:

1. I. Vida-Simiti, C. Ciupan, Process for Making Porous Tubes by the Rolling With Elastic Layer of Sintered Sheet Metal. RO 123245 B1/29.04.2011.
2. H. Binchiciu, V. Geantă, I. Voiculescu, A. Binchiciu, R. Stefănoiu, E. Binchiciu, R. Negriu, I. Vida-Simiti, Bronze coated electrode for thick load welding, RO 125855 B1/2012.
3. Vida-Simiti I, Thalmaier Gy., Moldovan V, Sechel A. N., Nasca O., Process and device for preparing sintered materials of gradual porous structure by gravitational settling of powders, RO128489-A2, RO128489-B1

The offer addressed to the economic environment

Research & development	Fundamental research on the process of sedimentation metallic and ceramic powders for achieving gradual sintered porous structures Obtaining sintered porous media with porosity gradient for manufacturing filters for microfiltration; Preparation and characterization of metal matrix composites and ceramics for various applications.
Consulting	Dimensioning filtering elements
Training	Powder metallurgy

BIOMATERIALS RESEARCH GROUP

Contact details

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Areas of expertise

Biomaterials

- Synthesis and characterization of biomaterials designed for soft / hard tissue implants; functionalization of implants surface in view of a designed body reaction; titanium-base structures with ultralow Young's modulus and / or osseointegration optimized surface.

Tissue Engineering

- Synthesis and characterization of scaffolds designed for the growth of tissue from stem / primary cells; design and manufacturing of synthetic – tissue hybrid materials for grafts; synthesis of drug delivery systems / biologically active hydrogel-base microspheres.

Medical Microfluidics

- Design, manufacturing and testing of microfluidic devices for cells selection.

Team

Prof. Dr. Eng. Cătălin Popa, Lect. Dr. Eng. Codruța Pavel, Dr. Eng. Violeta Pașcalău, Lect. Dr. Eng. Gabriel Batin, Eng. Darius Jucan, Eng. Alexandra Csapai

Representative projects

IMPROVE – “Development of robot assisted minimally-invasive treatment methods through brachytherapy and target delivered drugs for non-rescuable liver tumors”, PN-III-P1-1.2-PCCDI-2017-0221/59PCCDI/2018 (2018 – 2020);

STEMREG – “Hybrid composite grafts obtained through Tissue Engineering and stem cells with application in Regenerative Medicine”, PN II Partnerships (2012 – 2016);

BIOMAPIM – “New biocompatible materials manufactured through SLS and SLM”, PN II Complex Ideas (2010 – 2013);

BIOINTECH – “Application of Tissue Engineering innovative methods in the pathology of digestive tube – multidisciplinary approach”, PN II, Partnerships (2008 – 2011);

“Neutron Reflectivity Study of the Response of Membrane Proteins in Model Bilayers to AC Fields”, ISIS Beamtime Application RB720167, 2007, U.K.

“Composite biomaterials for radiotherapy and simultaneous hyperthermia”, CEEX 100/2006;

“Innovative methods in the reconstructive surgery of cancer patient – composite tissue grafting and employment of biocompatible synthetic materials”, CEEX 109/ 2006;

“Optimization of the management for the polytraumatized patient through therapeutic protocols of miniinvasive methods and through the use of biocompatible materials in the reconstruction of tissue or organ post-traumatic

defects", CEEX 145/ 2006;
"Functionalized conjugated polymers – based nanostructures and related nanocomposites", CEEX 12/ 2005;
"Microfluidics with Electrode Integration for Blood Cells Dynamic Studies", EPSRC Grant IRC A1 B3R (IRC, Queen Mary, University of London), 2005;
"Neutron Reflection Study of the Electric Characterisation of Cells", ISIS Beamtime Application RB610554, CCLRC, UK, 2005;
"Porous nanocrystalline silicon – polypyrrole multi-layered materials destined to the selective dielectrophoresis of blood cells", Matnantech 208(403)/2004;
"Functionally graded biomaterials, biomimetically structured, destined to personalised endosseous implants", Matnantech 163(303)/2003;

Significant results

The most representative publications of the past 5 years:

1. V. Paşcalău, C. Bogdan, E. Pall, S. Matroş, Pandrea, M. Suci, G. Borodi, C. Iuga, R. Ştiufiuc, T. Topală, C. Pavel, C. Popa, M. Moldovan, Development of BSA gel/Pectin/Chitosan polyelectrolyte complex microcapsules for Berberine delivery and evaluation of their inhibitory effect on Cutibacterium acnes, *Reactive and Functional Polymers* 2020, 147, Article number 104457;
2. V. Paşcalău, M. Tertis, E. Pall, M. Suci, T. Marinca, M. Pustan, V. Merie, I. Rus, C. Moldovan, T. Topala, C. Pavel, C. Popa, Bovine serum albumin gel/polyelectrolyte complex of hyaluronic acid and chitosan based microcarriers for Sorafenib targeted delivery, *Journal of Applied Polymer Science* 2020, Article number 49002;
3. M. Todea, A. Vulpoi, C. Popa, P. Berce, S. Simon, Effect of different surface treatments on bioactivity of porous titanium implants, *Journal of Materials Science and Technology* 2019, 35(3), 418-426;
4. Chicinas, H. F.; Contiu, G.; Sechel, N. A.; et al., Preparation and characterisation of WC-10Co powders obtained by aqueous milling, *Ceramics International* 2019, 45(4), 5177-5184;
5. Pascualau, Violeta; Dindelegan, George; Dirzu, Noemi; et al., Bioactive Ti-base biomaterial with sustained anti-bacterial response for endosseous applications, *Reactive & Functional Polymers* 2018, 125, 37-46;
6. Chicinas, H. F.; Marinca, T. F.; Gotze, P.; et al., Influence of aqueous milling duration on the sintered WC-10Co hard metal powders, *Journal of Materials Science* 2018, 53(4), 2901-2910;
7. V. Paşcalău, O. Soritau, F. Popa, C. Pavel, V. Coman, I. Perhaita, G. Borodi, N. Dirzu, F. Tabaran, C. Popa, Curcumin delivered through bovine serum albumin/polysaccharides multilayered microcapsules, *Journal of Biomaterials Applications* 2016, 30 (6) , 857-872;
8. A.M. Salantiu, C. Fekete, L. Muresan, P. Pascuta, F. Popa, C. Popa, "Anodic oxidation of PM porous titanium for increasing the corrosion resistance of endosseous implants", *Materials Chemistry and Physics* 2015, 149-150, 453-459;

Significant solutions:

Design – synthesis – characterisation of controlled porosity PM titanium for endosseous implants;
 Functionalization of titanium implants for enhancing osseointegration;
 Functionalization of surgical instruments for low halo effect;
 Functionalization of surgical meshes in view of controlled tissue adhesion;
 Design – synthesis – characterisation of biodegradable polymers scaffolds for culturing cells / organelles;
 Design - synthesis of delivery systems for active agents in Tissue Engineering and wound healing;
 Design, manufacturing and testing of microfluidic devices for the selection of blood cells.

Technologies:

- PM processing of titanium and titanium – base alloys;
- Synthesis of drug / active factors containing microspheres;
- Electrospinning of composite structures;
- Sol-gel coating and surface conditioning of metallic biomaterials;

Patents:

C. Popa, L. Cont, G. Dindelegan, V. Simon, I. Brie, C. Pavel, V. Candea – Method for the manufacturing of scaffolds and composite materials destined to Tissue Engineering, RO patent Nr. 127534;

The offer addressed to the economic environment

Research & development	Design and synthesis of new bioactive or hybrid materials for implants / grafts; Development of application designed complex structures for medical accessories: dental and maxillary-facial implants, orthopedic implants, "wound dressing", personalized medical instruments, surgical clips and staples; Development of new 3D scaffolds for the seeding of stem / primary cells / organelles in view of growing tissue / organ grafts; Development of new drug delivery systems with applications in Tissue Engineering, cancer, wound healing, diabetes, postoperative therapy; Development of microfluidic devices for the active selection / separation of live cells;
Consulting	Improvement of constructive / technologic design for dental, maxillary-facial and orthopedic implants; consultancy in the field of materials and technologies for surgical units.

MAGNETIC MATERIALS AND NANOMATERIALS RESEARCH GROUP

Contact details

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Areas of expertise

Nanocrystalline and nanocomposite magnetic powders production by mechanical alloying/milling, production of bonded magnets, sintered magnetic materials (soft and hard), obtaining of nanocrystalline compacts (composite and sintered – SPS), consulting in magnetic materials field, materials characterization, structural, morphological and thermal analysis (X-ray diffraction, SEM + EDX, DTA, DSC+TG).

Team

Prof. Dr. Eng. Phys. Ionel Chicinaş, Associate Prof. Dr. Eng. Florin Popa, Associate Prof. Dr. Eng. Bogdan Viorel Neamţu, Associate Prof. Dr. Eng. Traian Florin Marinca; Lecturer Dr. Eng. Calin Virgiliu Prica, Researcher. Dr. Eng. Adriana Lidia Sorcoi, Phd. students: Eng. Victor Cebotari, Eng. Ana Cotai, Eng. Katalin Ildiko Szasz, Master students: Eng Alexandru Opriş, Eng. Victor Petru Toşa, Eng. Carmen Buzilă, Eng. Loredana Cotojman.

Representative projects

“Fibers based soft magnetic composites prepared by cold pressing and spark plasma sintering”, PN-III-P1-1.1-TE-2016-0649 (2018-2020), <https://neamtubogdan.wixsite.com/fsmc>
 “MagCore-MHF - High magnetic flux density sintered magnetic cores produced from pseudo core-shell/core-shell powders for medium to high frequencies applications”, PN-III-P2-2.1-PED-2016-1816, (2017-2018), <http://www.sim.utcluj.ro/contracte/PN-III-P2-2.1-PED-2016-1816/>
 “Soft magnetic cores via powder metallurgy. Technology development and implementation”, PN-III-P2-2.1-BG-2016-0365, (2016-2018), <http://www.sim.utcluj.ro/contracte/PN-III-P2-2.1-BG-2016-0365/>
 New technology of iron content reduction from quartz sands by magnetic separation, PN-III-P2-2.1-BG-2016-0214, (2016-2018) <http://www.sim.utcluj.ro/contracte/PN-III-P2-2.1-BG-2016-0214/>
 “Researches on synthesis of spark plasma sintered nanocomposite compacts of Permalloy/Fe-Si type using mechanically alloyed powders”, Bilateral cooperation project: France-Romania, (2013-2014)
 “Soft magnetic nanocrystalline/nanostructured powders and compacts obtained by mechanosynthesis and spark plasma sintering”, PNII-ID-PCE, (2012)
 “Amorphous soft magnetic Fe-based and Co-based powders and cores prepared by mechanical alloying and spark plasma sintering”, PNII-RU-TE, (2012)
 “Spark plasma sintered soft magnetic composite/nanocomposite compacts of iron alloy/iron mixed ferrite type”, PNII-RU-TE, (2012)
 “Powders and soft magnetic materials nanocomposites of ferrite/transition metal (MeFe2O4/(Fe, Ni, Fe-Ni-X) type exchange coupled, obtained by mechanical alloying”, PNII-ID-PCE - ID, (2008)

Significant results

The most representative publications of the past 5 years (2016-2020):

- 1 B.V. Neamţu, A. Belea, F. Popa et al., Properties of soft magnetic composites based on Fe fibres coated with SiO₂ by hydrothermal method, *Journal of Alloys and Compounds*, vol. 826 (2020) in press, Q1 ranked

- 2 B.V. Neamțu, A. Opreș, P. Pszola, F. Popa, T.F. Marinca, N. Vlad, I. Chicinaș, Preparation and characterization of soft magnetic composites based on Fe fibres, *J. Materials Science* 55 (2020) 1414–1424, February 2020, Q2 ranked.
- 3 C. D. Stanciu, J.B. Marimon da Cunha, I. Chicinaș, O. Isnard, Structural, magnetic and Mössbauer spectroscopy characterisation of the Fe-15 wt. %Si nanocrystalline powder obtained by mechanical alloying and annealing, *Journal of Alloys and Compounds*, 797 (2019) 865-873, Q1 ranked
- 4 C.V. Prică, T.F. Marinca, B.V. Neamțu, F. Popa et al., Structural and thermal investigation of Ta-25 % wt. Cu alloy prepared by mechanosynthesis route, *Journal of Thermal Analysis and Calorimetry* 136 (2019) 995–1001, Q2 ranked
- 5 N. Maat, R. Larde, V. Nachbaur, J.M. Le Breton, O. Isnard, V. Pop, I. Chicinaș, Investigation by Mossbauer spectroscopy and atom probe tomography of the phase transformation of Nd-Fe-B alloys after high-energy ball milling, *Journal of Applied Physics*, 124 (2018) Issue: 22, Article Number: 223905, Q2 ranked
- 6 H.F. Chicinaș, T.F. Marinca, B.V. Neamțu et al., Influence of process control agent type on the mechanosynthesis of Fe₃O₄ particles, *Advanced Powder Technology* 29 (2018) 1838-1847 Published: AUG 2018, Q2 ranked
- 7 C.V. Prica, B.V. Neamțu, F. Popa et al., Invar-type nanocrystalline compacts obtained by spark plasma sintering from mechanically alloyed powders, *Journal of Materials Science* 53 (2018) 3735-3743 Q2 ranked
- 8 Neamțu, B. V.; Năsui, M.; Marinca, T. F.; et al., Soft magnetic composites based on hybrid coated Fe-Si nanocrystalline powders, *Surface & Coatings Technology* 330 (2017) 219-227 Published: DEC 1 2017, Q1 ranked
- 9 C. D. Stanciu, T.F. Marinca, I. Chicinaș, O. Isnard, Characterisation of the Fe-10 wt. % Si nanocrystalline powder obtained by mechanical alloying and annealing, *J. Magnetism and Magnetic Mater.* 441 (2017) 455-464, Q2 ranked
- 10 T.F. Marinca, H. F. Chicinaș, B. V. Neamțu, I. Chicinaș, O. Isnard, F. Popa, et al., "Nanocrystalline/nanosized Fe₃O₄ obtained by a combined route ceramic-mechanical milling. Effect of milling on the chemical composition, formation of phases and powder characteristics", *Advanced Powder Technology*, 27 (2016) 1588-1596, Jul 2016, Q2 ranked
- 11 T. F. Marinca, H. F. Chicinaș, B. V. Neamțu, O. Isnard et al., "Mechanosynthesis, structural, thermal and magnetic characteristics of oleic acid coated Fe₃O₄ nanoparticles", *Materials Chemistry and Physics*, 171 (2016) 336-345, Mar 2016, Q2 ranked
- 12 T. F. Marinca, I. Chicinaș, O. Isnard, and B. V. Neamțu, "Nanocrystalline/nanosized manganese substituted nickel ferrites - Ni_{1-x}Mn_xFe₂O₄ obtained by ceramic-mechanical milling route", *Ceramics International*, 42 (2016) 4754-4763, Mar 2016, Q1 ranked
- 13 B. V. Neamțu, H. F. Chicinaș, T. F. Marinca, O. Isnard, and I. Chicinaș, "Preparation and characterisation of Co-Fe-Ni-M-Si-B (M = Zr, Ti) amorphous powders by wet mechanical alloying", *Journal of Alloys and Compounds*, 673 (2016) 80-85, Jul 2016, Q1 ranked
- 14 B. V. Neamțu, H. F. Chicinaș, T. F. Marinca, O. Isnard, I. Chicinaș, and F. Popa, "Synthesis of amorphous Fe₇₅Si_{20-x}M_xB₅ (M = Ti, Ta, Zr) via wet mechanical alloying and its structural, thermal and magnetic characterisation", *Advanced Powder Technology*, 27 (2016) 461-470, Mar 2016, Q2 ranked
- 15 B. V. Neamțu, H. F. Chicinaș, T. F. Marinca et al, "Amorphisation of Fe-based alloy via wet mechanical alloying assisted by PCA decomposition", *Materials Chemistry and Physics*, 183 (2016) 83-92, Nov 2016, Q2 ranked

Significant solutions: Synthesis routes for obtaining nanocrystalline/nanosized, composite/nanocomposite and amorphous magnetic materials

Nanocrystalline/nanosized, composite, nanocomposite and amorphous powder compaction.

Products and technologies (Designed and developed of home-made spark plasma sintering equipment):

1. The group obtained nanocrystalline magnetic powders of Ni₃Fe, Superalloy (NiFeMo, NiFeCuMo) and developed 2 mechanical alloying method (mechanical alloying combined with annealing, MA with germ of product insertion)
2. Nanocomposite magnetic powders of spring-magnet type (SmCo₅/α-Fe, SmCo₂Cu₃/α-Fe, Nd₂Fe₁₄B/α-Fe, (Pr,Dy)₂Fe₁₄B/α-Fe) obtained by mechanical milling
3. Soft magnetic nanocomposite materials, from nanocrystalline powders obtained by mechanical alloying
4. Soft nanocrystalline ferrites obtained by mechanical alloying
5. Nanocomposite powder of soft ferrite/alloy type (ZnFe₂O₄/Fe or Ni, NiFe₂O₄/Fe etc) and nanocomposite compacts

Patents/patents pending:

1. P. Cărlan, I. Chicinaș, *Process for preparing the powder of IrAl and IrAl₃ intermetallic compounds and irradiation target for industrial gammagraphy obtained there with*, Patent Number(s): RO123425-B1
2. I. Chicinaș, T.F. Marinca, F. Popa, B.V. Neamțu, *Process to obtain the nanostructured powder of permalloy (supermalloy) Rhometal type*, Patent Number(s): RO130354-A0; RO130354-B1.
3. I. Chicinaș, T.F. Marinca, F. Popa, B.V. Neamțu, *Pulberi compozite de tipul Fe sau aliaj feromagnetic/ferită magnetic moale cu structură pseudo „core-shell” și procedeu de obținere*, OSIM-Nr. A10083/18.12.2015, patent pending.

The offer addressed to the economic environment

Research & development	Preparation of nanocomposite/nanocrystalline/nanosized magnetic powders and composite/nanocomposite compacts. Structural, morphological and magnetic characterisation of powders and compacts. Study of exchange coupling in nanocomposites. Researches on the development of magnetic materials for medium and high frequencies. Production of the bonded magnets, production of the nanocrystalline and nanostructured powders by mechanical alloying/milling and reactive milling, production of magnetic cores (sintered and composite), specific measurements, structural analysis, SEM and EDX analysis.
Consulting	Soft and hard magnetic materials, magnetic hysteresis measurement in DC & AC (up to 10 kHz) for permanent magnets & magnetic cores, mechanosynthesis, reactive milling, X-ray diffraction, SEM+EDX
Training	Lectures in: magnetic materials, mechanosynthesis, XRD, SEM, EDX, DSC-TG. Coordination for PhD projects related to elaboration of magnetic powders produced by mechanical alloying, bonded magnets, sintered soft&hard composites&nanocomposite magnetic materials.

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Areas of expertise

clean technologies, waste recovery, recycling materials, ecological reconstruction, sustainable development, new materials, sustainable energy, structural modelling, risk assessment, impact studies, monitoring systems

Team

Assoc. Prof. Dr. Eng. Viorel Dan, Prof. Dr. Eng. Tiberiu Rusu, Prof. Dr. Eng. Valer Micle, Assoc. Prof. Dr. Eng. Ovidiu Nemeş, Assoc. Prof. Dr. Eng. Emil Riţi-Mihoc, Assist. Prof. Dr. Eng. Marius Crişan, Assist. Prof. Dr. Eng. Dan Porcar, Assist. Prof. Dr. Eng. Ioana Deneş-Pop, Assist. Prof. Dr. Eng. Cristina Horju-Deac, Assist. Prof. Dr. Eng. Simona Avram, Assist. Prof. Dr. Eng. Timea Gabor, Assist. Prof. Dr. Eng. Bianca Soporan, Assist. Prof. Dr. Eng. Andrei Rusu, Assist. Prof. Dr. Eng. Ancuţa Tiuc

Representative projects

“Tehnologie inovativă de bioremediere ex-situ a solurilor poluate cu hidrocarburi, PN-II-PT-PCCA-2013-4-1717, 2014-2017
 “Stabilirea corelaţiei între conductivitatea băii şi cantitatea de fosfaţi acumulată la lubrifiere”, C.I.1.1.T.2, 2016.
 “Design of an Equipment to recycle used PET bottles”, Industry Research Project, (2014)
 “Network of Excellence HighTech Europe”, (2009-2013)
 “Biomedical application of metal compounds – Metallomics”, PCCE, (2010-2013)
 “Center for Molecular Modeling and Quantic Computational Chemistry”, Capacities Project, (2007-2009)
 “Innovative technology for contaminated soils remediation by metallurgical specific activities”, PNCDI II, (2008-2011)
 “Regeneration system for recycling organic waste chemically bonded moulding sand in the foundry industry”, CEEX, (2006-2008)
 “Technologies for metals and plastics recovery from waste and telecommunications equipment”, CEEX, (2005-2007)
 “Advanced optimization methods of bonded joints in metal, composite and mixed materials”, PNII-ID, (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Ancuţa Elena Tiuc, Ovidiu Nemeş, Horatiu Vermesan, Adina Cristina Toma, New sound absorbent composite materials based on sawdust and polyurethane foam, Composites Part B: Engineering, Volume 165, 15 May 2019, Pages 120-130.
2. Ancuţa Elena Tiuc, Ovidiu Nemeş, Horatiu Vermesan, Roxana Tamas-Gavrea, Ovidiu Vasile, New sound absorbing materials obtained from waste rigid polyurethane foam, Materiale Plastice, vol.56, No.4, 2019.
3. Olteanu, M., Septelea, R., Nemes, O., Deak, G., Baraitaru, A. Functionalization of mesoporous silica materials using Calix[4]arenes, Materiale Plastice, 56(3), pp. 554-558, 2019

4. Bere, Paul; Dudescu, Mircea; Neamtu, Calin; Nemes Ovidiu et al., Fabrication and Mechanical Characterization of Short Fiber-Glass Epoxy Composites MATERIALS PERFORMANCE AND CHARACTERIZATION Volume: 8 Issue: 1, Pages: 163-174 Published: 2019
5. Plugaru, Sebastian Cristian Radu; Dan, Viorel; Mentiu, Xenia Paula, USE OF GREEN ALGAE TO REDUCE HEAVY METALS FROM INDUSTRIALLY POLLUTED WATERS SCIENTIFIC PAPERS-SERIES E-LAND RECLAMATION EARTH OBSERVATION & SURVEYING ENVIRONMENTAL ENGINEERING Volume: 7 Pages: 136-139 Published: 2018
6. Lakatos, Elena Simina; Cioca, Lucian-Ionel; Dan, Viorel; et al., Studies and Investigation about the Attitude towards Sustainable Production, Consumption and Waste Generation in Line with Circular Economy in Romania SUSTAINABILITY Volume: 10 Issue: 3 Article Number: UNSP 865 Published: MAR 2018
7. Tiuc, Ancuta Elena; Vasile, Ovidiu; Vermesan, Horatiu; et al., New Multilayered Composite for Sound Absorbing Applications ROMANIAN JOURNAL OF ACOUSTICS AND VIBRATION Volume: 15 Issue: 2 Pages: 115-121 Published: 2018
8. Gabor, Timea; Dan, Viorel; Badila, Iulian-Nicolae; et al., IMPROVING THE ENERGY EFFICIENCY OF RESIDENTIAL BUILDINGS BY USING A DRAIN WATER HEAT RECOVERY SYSTEM ENVIRONMENTAL ENGINEERING AND MANAGEMENT JOURNAL Volume: 16 Issue: 7 Pages: 1631-1636 Published: JUL 2017
9. G. E. Popita, C. Rosu, D. Manciu, O. Corbu, A. Popovici, O. Nemes, et al., "Industrial Tanned Leather Waste Embedded in Modern Composite Materials", *Materiale Plastice*, vol. 53, pp. 308-311, Jun 2016.
10. A. E. Tiuc, V. Dan, H. Vermesan, T. Gabor, and M. Proorocu, "Recovery of Sawdust and Recycled Rubber Granules as Sound Absorbing Materials", *Environmental Engineering and Management Journal*, vol. 15, pp. 1093-1101, May 2016.
11. T. Gabor, V. Dan, A. E. Tiuc, I. M. Sur, and I. N. Badila, "Modelling And Simulation of Heat Transfer Processes for Heat Exchangers Used in Wastewater Treatment", *Environmental Engineering and Management Journal*, vol. 15, pp. 1027-1033, May 2016.
12. G. C. Rogozan, V. Micle, and I. M. Sur, "Maps of Heavy Metals in Cluj County Soils Developed using the Regression-Kriging Method", *Environmental Engineering and Management Journal*, vol. 15, pp. 1035-1039, May 2016.
13. I. Smical, A. Muntean, and V. Micle, "Influence of Some Natural Organic Additives on the Quality of Vegetal Compost", *Environmental Engineering and Management Journal*, vol. 15, pp. 1041-1048, May 2016.
14. Tiuc A.E., Vermeşan H., Gabor T., Vasile O., "Improved sound absorption properties of polyurethane foam mixed with textile waste", *Energy Procedia*, Volume 85, January 2016, Pages 559–565, EENVIRO-YRC 2015 - Bucharest doi:10.1016/j.egypro.2015.12.245
15. A.E. Tiuc, O. Nemeş, I. Perhaiţa, H. Vermeşan, T. Gabor, V. Dan, "Thermal behaviour of polyurethane matrix composite materials", *Studia Universitatis Babes-Bolyai Chimia* Issue 2, pp. 169-176, 2015
16. M.B. Soporan, O. Nemeş, "Quantitative analysis of the noncompliant landfill constituents", *Studia Universitatis Babes-Bolyai Chimia* Issue 2, pp. 201-206, 2015
17. S.-A. Radu, V.D. Leordean, N. Bâlc, O. Nemeş, "Resin type influence on moulded parts final dimensions", *Studia Universitatis Babes-Bolyai Chimia* Issue 2, pp. 219-228, 2015
18. J.D. Chelaru, L.M. Muresan, V.F. Soporan, O. Nemes, L. Barbu-Tudoran, "Investigation of a naturally patinated bronze artifact originating from the outdoor statuary group of Mathias Rex", *Journal of Cultural Heritage* Volume: 15, Issue: 5, 2014, pp: 546-549

Significant solutions:

New technologies for waste recycling; New technologies for soil remediation; New and improved solution for water treatment

Products and technologies:

1. New materials from multi-layer packages, wood saw dust and vegetal wastes
2. New technologies for soil remediation
3. New technologies for water treatment

Patents:

1. PROCESS AND DEVICE FOR MAKING PLATES OF POLYMERIC COMPOSITE MATERIALS REINFORCED WITH FIBERS, Patent Number(s): RO128093-A0 ; RO128093-B1 ; RO128093-A8, **INVENTOR(S)**: BERE P, BERCE P, NEMES O, BALC N, BERE P P, 2015.

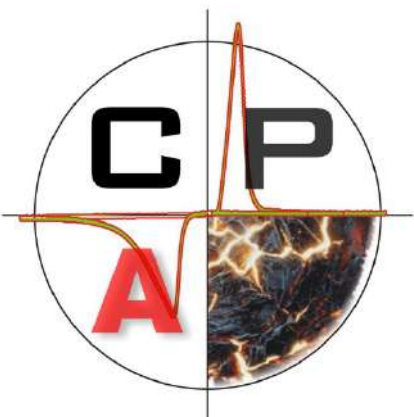
2. SOUNDPROOFING COMPOSITE MATERIAL COMPRISES FIR SAWDUST GRAINS AND POLYURETHANE FOAM, Patent Number(s): RO129228-A0 ; RO129228-B1 ; RO129228-A8, 2015, Authors: Ancuța Tiuc, Tiberiu Rusu, Ovidiu Nemeş

The offer addressed to the economic environment

Research & development	Research in development of new methods and technologies of soil remediation Research and development of new methods and technologies of water treatment Research in environmental risk assessments Research in waste recycling and new materials manufacturing
Consulting	Consulting in soil remediation Consulting in water treatment technologies Consulting in waste management and recycling technologies Consulting in risk assessments
Training	Training courses in waste management; Training courses in recycling technologies Training courses in soil remediation technologies; Training courses in water treatment

CORROSION AND ANTICORROSION PROTECTION CENTER

Contact details

Name	Corrosion and Anticorrosion Protection Centre
Acronym	CAPC
Logo	
Site	coroziune.utcluj.ro
Address	103-105 Muncii Av., room G09C 400641, Cluj-Napoca, Romania
Faculty Department	Faculty of Materials and Environmental Engineering Environmental Engineering Department
Telephone	+40 264 401696
Fax	+40 264 415 054
Director	Assoc. Prof. Dr. Eng. Horatiu Vermesan
e-mail	Horatiu.Vermesan@imadd.utcluj.ro



Areas of expertise

Surface Engineering technologies for corrosion protection. Layers that alter the structure and / or chemical composition and deposition of anticorrosion coatings.
 Analysis and characterization of surface layers. Characterization of deposit thickness, adhesion, degree of gloss, mechanical properties, tribological properties.
 Evaluation of corrosion resistance in artificial atmosphere according to ISO 9227, ISO 10289 and ASTM B117.
 Electrochemical methods for the characterization of corrosion through accelerated corrosion tests. Cyclic voltammetry, polarization resistance, impedance spectroscopy

Team

Assoc. Prof. Dr. Eng. Horațiu VERMEȘAN, Assist. Prof. Dr. Eng. Gavril NEGREA, Assoc Prof. Ancuta TIUC
 PhD student: Cătălin LATES, PhD student: Denisa CUIBUS

Representative projects

TheTRADE-IT: Innovative Technologies For Advanced Materials Recovery from IT and Telecommunication Waste
 PN-III-P1-1.2-PCCDI-2017-0652, project NR. 84PCCDI - 01/03/2018 TRADE-IT.
Establishing the correlation between bath conductivity and the amount of phosphates accumulated at lubrication, project code C.I.1.1.T.2, 2016, financed by TUCN
ZINITECH: "Innovative technology for production of zinc-nickel alloy layers with anticorrosive properties by co-deposition of composite nano-particles", INNOVATION Project 261/20.10.2008
"Thermal shock behavior of functional gradient layers deposit on austenitic stainless steels", Grant 944/2005;
"Obtaining, characterization and modeling of thin layers with specific properties" Contract 33385 tema A67, code CNCIS 404
"Theoretical and experimental research concerning the tribo-corrosion of diffusion layers obtained by surface engineering technologies", 66-1353-2001.
"The amelioration of wear and corrosion resistance by plastic deformation and plasma nitriding surface hardening" Project 7067-B4.
"Researches concerning the influence of oxygen on the structure and properties of nitrided and nitrocarburized layers" Project AT, 3/225 2001
"Nano-crystalline electro-deposits - their processing, character and properties"

EC Research Project, NEPCAP, Contract No G1ST-CT-2002-50211;

Significant results

The most representative publications of the past 5 years:

1. Borlea S. I., Tiuc A. E., Nemeş O., Vermeşan H., Vasile O., Innovative Use of Sheep Wool for Obtaining Materials with Improved Sound-Absorbing Properties, *Materials* 2020, 13(3), 694. Published: FEB 2020.
2. Vermeşan H., Tiuc A. E., Purcar M., Advanced Recovery Techniques for Waste Materials from IT and Telecommunication Equipment Printed Circuit Boards, *Sustainability* 2020, 12(1), Published: IAN 2020.
3. Tiuc, Ancuta Elena; Vasile, Ovidiu; Vermesan, Horatiu; et al., Sound Absorbing Insulating Composites Based on Polyurethane Foam and Waste Materials, *MATERIALE PLASTICE* Volume: 55 Issue: 3 Pages: 419-422 Published: SEP 2018
4. Rada, S.; Cuius, D.; Vermesan, H.; et al., Structural and electrochemical properties of recycled active electrodes from spent lead acid battery and modified with different manganese dioxide contents *ELECTROCHIMICA ACTA* Volume: 268 Pages: 332-339 Published: APR 1 2018
5. Tiuc, Ancuta Elena; Vasile, Ovidiu; Vermesan, Horatiu; et al., The Use of Mathematical Models in Determining Acoustic Absorption Coefficient of New Composite Porous Materials *ROMANIAN JOURNAL OF ACOUSTICS AND VIBRATION* Volume: 14 Issue: 2 Pages: 97-101 Published: 2017
6. A. E. Tiuc, V. Dan, H. Vermesan, T. Gabor, and M. Proorocu, "Recovery of Sawdust and Recycled Rubber Granules as Sound Absorbing Materials", *Environmental Engineering and Management Journal*, vol. 15, pp. 1093-1101, May 2016.
7. S. Rada, M. L. Unguresan, L. Bolundut, M. Rada, H. Vermesan, M. Pica, et al., "Structural and electrochemical investigations of the electrodes obtained by recycling of lead acid batteries", *Journal of Electroanalytical Chemistry*, vol. 780, pp. 187-196, Nov 2016.
8. Vasile Rus, Horațiu Vermeşan, Andreea Hegyi, Ancuța Elena Tiuc, "Electrochemical Impedance Spectroscopy Study - Evolution Modeling of Corrosion Products Layer Formed at Hot Dip Galvanized Rebar–Fresh Concrete Interface", *Revista Română de Materiale / Romanian Journal of Materials* 2016, 46 (2), 196 – 203
9. Tiuc A.E., Vermeşan H., Gabor T., Vasile O., "Improved sound absorption properties of polyurethane foam mixed with textile waste", *Energy Procedia*, Volume 85, January 2016, Pages 559–565, EENVIRO-YRC 2015 - Bucharest doi:10.1016/j.egypro.2015.12.245
10. Rus V., Hegyi A., Vermeşan H., Tiuc A. E., "Steel reinforcement in fresh concrete", *Studia Universitatis Babeş-Bolyai Seria Chemia*, vol. LX (60), issue 2, Tom II, pp. 409-419, 2015.

Significant solutions:

Estimation of corrosive action of different natural atmospheric environments. Anticorrosive protection of materials in different aggressive climatic conditions: urban, industry, marine, mining etc. Testing of galvanic (contact) corrosion of different metals. Accelerated corrosion testing of protective paint coatings. Investigation of the micro-structural properties of protective coatings: thickness, impact tests, adherence (cross-cut and pull off methods), drawability, elasticity, relative hardness and abrasion. Improving corrosion resistance of hot-dip galvanized coatings. Choice of paints for effective protection of galvanized steel structures;

Products and technologies:

1. Technology for obtaining anti-corrosion layers by composite nano-particles codeposition
2. Technology for obtaining of zinc-nickel alloy layers with anticorrosive properties by co-deposition of composite nano-particles
3. Surface engineering technologies for improving wear resistance of austenitic stainless steels.
4. Nano-crystalline electro-deposits with high anticorrosion properties.
5. Diffusion layers obtained by surface engineering technologies for tribocorrosion applications.

The offer addressed to the economic environment

Research & development	Development of original solutions for protection against corrosion in various environments Security of social infrastructure and security of long service life coated steel sheet Study the fundamental characteristics of corrosion behaviour and utilise this knowledge to develop new technologies and processes to help solve challenging problems and issues. Partner with industry and continue to foster relationships to tackle pressing corrosion and surface related demands affecting our society.
Consulting	Choosing the Surface Engineering technologies for corrosion protection purposes. Research on corrosion behaviour of metallic deposits. Study of new layers with anticorrosive properties.
Training	Training courses for engineers in the field of corrosion and corrosion protection. The best available techniques in corrosion protection technologies. Training courses in electrochemical deposition of metals and alloys.

MATERIALS SCIENCE AND ENGINEERING RESEARCH CENTER

Contact details

Name	Materials Science and Engineering Research Center
Acronym	MSERC
Logo	
Site	http://research.utcluj.ro/index.php/domenii-de-cercetare.html http://research.utcluj.ro/tl_files/research/Research%20Domain/Ingineria%20Materialelor/4_Hotea.pdf
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Telephone	+40 362407266
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Areas of expertise

Nonferrous Alloys ,

-Casting of nonferrous alloys, metallic powders, Characterization mixtures, heat treatment

Heat and Cold Deformation

Attempts heat and cold deformation by traction and compression for aluminum alloys, extrusion, forging

Surface Engineering

Thin film layers, electroplating, anodizing, corrosion and anticorrosive protection

Analysis Techniques

Determination of physical, chemical and mechanical properties of materials, metallographic analysis of materials (optical microscopy), X-Ray diffraction, SEM

Environmental protection

Environmental protection of industry, Risk assessment

Team

Prof. Dr. Eng. Vasile Hotea, Assoc. Prof. Dr. Eng. Elena Pop, Lecturer. Dr. Eng. Gheorghe Iepure, Lecturer Dr. Eng. Jozsef Juhasz, Lecturer Dr. Eng. Aurica Pop, Lecturer. Dr. Eng. Brezoczki Valeria, Sing. Loredana Hutira

Representative projects

"Energy Recovery from Municipal Solid Waste by Thermal Conversion Technologies in Cross-border Region", Project Manager: Juhasz Jozsef; Brezoczki Valeria, Parteneri: Technical University of Kosice (Slovak Republic), University of Miskolc (Hungary), **Technical University of Cluj-Napoca, North University Center of Baia Mare** (2019-2020), (Romania) <https://huskroua-cbc.eu/about/programme-description>
"Preventing and removing environmental impacts using geosynthetic materials", Grant CNCISIS, (2007-2009) Romanian Authority for Scientific Research (Joint Applied Research Project), http://frmm.ubm.ro/index_rom.htm
LEXIN, "Applied research on green heating technology and biogenetic type LEXIN", LEXIN Group (AGDE RUITER BEHEER BV, LEXIN HOLDING BV, LEXIN International B.V.), LEXIN Produktion GMBH, http://frmm.ubm.ro/index_rom.htm (2008-2009)

Significant results

The most representative publications of the past 5 years:

1. **V. Hotea, J. Jozsef**, Analysis of the extrusion process parameters of high-strength aluminum alloys used in the aerospace industry, International Conference of the Carpathian Euro-Region Specialists in

- Industrial Systems, CEurSIS 2019, IOP Conference Series: Materials Science and Engineering, Paper ID006_CEURSIS-in press
2. Damian, Gheorghe; Andras, Peter; Damian, Floarea; **Iepure G** et al., The role of organo-zeolitic material in supporting phytoremediation of a copper mining waste dump INTERNATIONAL JOURNAL OF PHYTOREMEDIATION Volume: 20 Issue: 13 Pages: 1307-1316 Published: NOV 10 2018
 3. Damian, Gheorghe; Lanzerstorfer, Christof; Damian, Floarea; **Iepure G** et al., Distribution of Heavy Metals and Minerals in the Various Size Fractions of Soil from CopE (TM) a Mic, RomAnia WATER AIR AND SOIL POLLUTION Volume: 229 Issue: 6 Article Number: 202 Published: JUN 2018
 4. **Hotea, V.; Juhasz, J.**; Cadar, F. , Grain refinement of 7075Al alloy microstructures by inoculation with Al-Ti-B master alloy INNOVATIVE IDEAS IN SCIENCE 2016, Book Series: IOP Conference Series-Materials Science and Engineering, Volume: 200, Article Number: UNSP 012029 Published: 2017
 5. **Pop, A.; Iepure, G.**, Research and development regarding the retaining mechanism of lead ions in industrial wastewaters using natural matter with remarkable properties Conference on Innovative Ideas in Science Location: Baia Mare, ROMANIA Date: NOV 10-11, 2016 Book Series: IOP Conference Series-Materials Science and Engineering Volume: 200 Article Number: UNSP 012068 Published: 2017
 6. M. M. Chicos, Gh. Damian, D. Stumbea, N. Buzgar, T. Ungureanu, V. Nica, **Gh. Iepure**, „Mineralogy and geochemistry of the tailings pond from straja valley (Suceava county, Romania). factors affecting the mobility of the elements on the surface of the waste deposit", *Carpathian Journal of Earth and Environmental Sciences*, Vol.1, No.1, 2016, pp. 265-280
 7. Chicos, Marian Marius; Damian, Gheorghe; Stumbea, Dan; **Iepure Gh** et al., Mineralogy and geochemistry of the tailings pond from Straja Valley (Suceava County, Romania). factors affecting the mobility of the elements on the surface of the waste deposit carpathian journal of earth and environmental sciences Volume: 11 Issue: 1 Pages: 265-280 Published: FEB 2016
 8. **V. Hotea**, „Clean Technology of Lead Recovery from Spent Lead Paste", in *Recent Researches in Applied Economics and Management, Economic Aspects of Environment*, vol. 2, august 27-29, 2013, pp. 263-270
 9. **J. Juhasz**, „Modern Systems for Processing of Brasses and Bronzes with Gas Filtration", in *Recent Researches in Applied Economics and Management, Economic Aspects of Environment*, vol. 2, august 27-29, 2013, pp. 259-263
 10. **Pop, A. I.** Vida-Simiti, G. Damian, **G. Iepure**, "Removal of Heavy Metals from Wastewaters by Using Zeolitic Tuff", in *Carpathian Journal of Earth and Environmental Sciences*, vol. 7, no. 1, 2012, pp.239-248

Patents

V. Hotea, G. Badescu, **J. Juhasz**, Procedeu de reținere prin absorbție chimică a dioxidului de carbon din gazele reziduale, Patent No. RO 127080/30.03.2016

V. Hotea, The plant for Capture of Sulfur Dioxide and Carbon Dioxide in the Flue Gases, Patent No. RO 125756 B1 29.11.2012

J. Jozsef, Process of obtaining from the concentrates of cupric oxide pellets, Patent No. RO125453B1, 2010

V. Hotea, Installation of a Continuously Supply of Cold Materials Processed Through Melting, Patent No. RO 122230/27.02.2009

The offer addressed to the economic environment

Research & development	Initiative in attracting funds pre-competitive research projects in public-private partnership initiated, especially those that involve collaboration with our university. The objective of these projects is to create new products and technologies with potential commercial exploitation. Focus of research efforts of our team to clearly identified problems to businesses through involvement in research and development projects representatives demand, especially that coming from regional multinational companies (Universal Alloy Corporation-USA) in the field of Materials Engineering, and national public authorities.
Consulting	Attracting customers (public and private agencies) with little experience in Materials Engineering to acquisition technologies underlying our research excellence for the the correct choice of materials, electrochemical coating technologies, fault analysis, development ferrous alloys, environmental protection industry.
Applied engineering services	Analysis and characterization of metallic materials, metallographic analysis, mechanical characterization, thermal shock, mechanical and corrosive behavior.
Training	Applications on courses, informal training type, indirect training, community integration, knowledge management in the field of Engineering Materials practical activities training.

MECHATRONICS AND ENERGY LABORATORY

Contact details

Name	Mechatronics and Energy Laboratory
Acronym	LME
Logo	
Site	http://mdm.utcluj.ro/Cercetare/Lab_ME/index.html
Address	103-105 Muncii Str., 400641, Cluj-Napoca, Romania
Faculty	Faculty of Automotive, Mechatronics and Mechanical Engineering
Department	Mechatronics and Machine Dynamics Department
Telephone	+40 264 401756
Fax	+40 264 415 490
Director	Prof. Dr. Eng. Radu Bălan
e-mail	radubalan@yahoo.com Radu.Balan@mmfm.utcluj.ro



Areas of expertise

Materials, processes and innovative products: Mechatronic systems, advanced industrial process control technologies, high precision mechanical products and technologies, advanced materials, innovative technologies for transportation. **Key words:** mechatronics, intelligent actuators, sensorial systems, advanced control, robotic systems;

Computer science technologies: Technologies for achieving high performance computing applications, opened, heterogeneous, scalable, fault tolerant and with a good connectivity between user and resources, artificial intelligence methods and systems. **Key words:** control algorithms, artificial intelligence, rapid control prototyping, human-machine interface systems;

Energy: Concepts, technologies and products that contribute to satisfy the energy needs at the lowest price, use of new energetic sources and improving the decisional process, increase of the technological competence and promotion of the knowledge transfer and technologies in energetic fields. **Key words:** energy efficiency, energy saving, renewable energy, control, sustainability, environment.

Team

Prof. Dr. Eng. Radu Bălan, Prof. Dr. Eng. Vistrian Mătieș, Prof. Dr. Eng. Victor Hodor, Assoc.Prof. Dr. Eng. Olimpiu Hancu, Lecturer Dr. Eng. Ciprian Lăpușan, Lecturer Dr. Eng. Sorin Besoiu, Lecturer Dr. Eng. Radu Donca, Assist. Dr. Eng. Alin Pleșa

Representative projects

MoniCult – “Design, manufacturing and testing of a mechatronic system for multispectral surveillance of crops vegetation status” PN-II-PT-PCCA-2013-4-1629, (2014-2017)

“Design of a mobile multifunctional platform for inner water pipe inspection”, (2012)

DEHEMS, “Digital Environment Home Energy Management System”, European FP7 project, <https://cordis.europa.eu/project/id/224609> (2008-2011)

FlexForm, “Flexible professional forming program on mechatronic platforms”, POSDRU, <http://www.flexform.ro/>

EQUATOR, “Advanced strategies for high performance indoor Environmental Quality in Operating Rooms”, PN-II-PT-PCCA, (2011)

“Research regarding advanced control in mechatronic applications”, PNII-Idei (2007-2010)

“Simulation, Control and Testing Platform with Applications in Mechatronics”, CEEX, (2006-2008)

“Numerical analysis and control of the combustion instability using acoustic analogy”, IDEI, 2007-2010

E-FARM, “Informatics support system for design, implementation and control for hybrid energy farms”, <http://www.automation.ro/e-farm/index.html> (2008)

AMFM," Implementing the shape memory effect in mechatronic systems using advanced materials obtained by powder metallurgy", 2008-2011
MMFEH, "Design of an innovative hydro-pneumatic system by implementing the shape memory alloy effect using powder metallurgy technology", (2008)

Significant results

The most representative publications of the past 5 years:

1. Macavei, Sergiu; Rada, Marius; Zagrai, Mioara; Balan, Radu et al., Spectroscopic Characterization of a Lead-Lead Dioxide Automobile Battery ANALYTICAL LETTERS Volume: 51 Issue: 17 Pages: 2671-2681 Published: 2018
2. Macavei, Sergiu; Toloman, Dana; Stefan, Maria; Balan Radu et al., Characterization of Cu₂ZnSnS₄ Thin Film Deposited by Pulse Laser Deposition 11TH INTERNATIONAL CONFERENCE OF PROCESSES IN ISOTOPES AND MOLECULES (PIM 2017) Book Series: AIP Conference Proceedings Volume: 1917 Article Number: UNSP 040010 Published: 2017
3. Rad, Ciprian-Radu; Hancu, Olimpiu, An improved nonlinear modelling and identification methodology of a servo-pneumatic actuating system with complex internal design for high-accuracy motion control applications SIMULATION MODELLING PRACTICE AND THEORY Volume: 75 Pages: 29-47 Published: JUN 2017
4. Lapusan, Ciprian; Balan, Radu; Hancu, Olimpiu; et al., Development of a Multi-Room Building Thermodynamic Model Using Simscape Library Conference on Sustainable Solutions for Energy and Environment (EENVIRO - YRC) Location: Bucharest, ROMANIA Date: NOV 18-20, 2015 EENVIRO-YRC 2015 - BUCHAREST Book Series: Energy Procedia Volume: 85 Pages: 320-328 Published: 2016
5. Lapusan, Ciprian; Hancu, Olimpiu; Rad, Ciprian; et al., Integrated learning platform based on Lego NXT and Matlab for teaching mechatronics 8th International Conference on Electronics, Computers and Artificial Intelligence (ECAI) Location: Ploiesti, ROMANIA Date: JUN 30-JUL 02, 2016 Book Series: International Conference on Electronics Computers and Artificial Intelligence Published: 2016
6. Huja, Mircea; Maties, Vistrian; Brai, Leon; et al., SIMULATION OF NONLINEAR POSITION AND ATTITUDE CONTROL FOR MICRO QUADCOPTER WITH LOW DISTURBANCE CONTROLLED BY SLIDING-MODE AND BACKSTEPPING METHODS ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 58 Issue: 3 Pages: 413-420 Published: SEP 2015
7. P. Lapusan, R. Balan, "Development of a Home Temperature Control Unit Based on a Model Predictive Control Strategy", *Acta Technica Napocensis*, Vol.3, nr.56, pp.25-28, 2015.
8. P. Lapusan, R. Balan, C. Rad, A. Plesa, "Development of a multi-room building thermal model for use in the design process of energy management systems", *ACTA TECHNICA NAPOCENSIS - Series: APPLIED MATHEMATICS, MECHANICS, and ENGINEERING*, Vol. 1, nr. 58, pp.41-48, 2015.

Significant solutions:

The development of the Matlab-dSpace research platforms with HIL-Hardware in the Loop, SIL-Software in The Loop, RCP-Rapid Control Prototyping applications

The implementation, testing and optimization of the modern/innovative control technics (state feedback control, optimal control, predictive control);

The optimization of the motion laws (elimination of shocks)-Cartesian robot with pneumatic action, industrial control technology (SPC201, FPC101)

Research on modelling and control of the energy consumption in buildings

Patents: 2

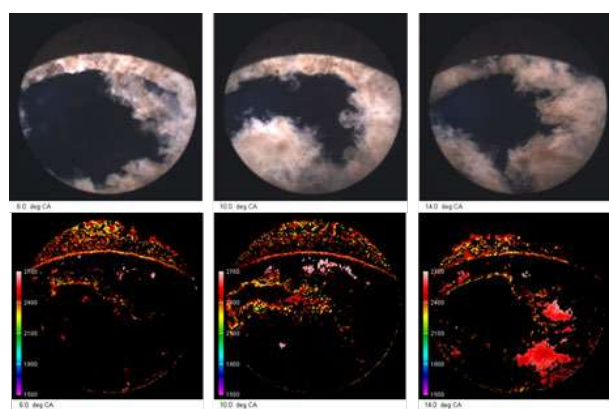
The offer addressed to the economic environment

Research & development	Fundamental research in mechatronics, energy, renewable energy, integronics, trans-disciplinary as well as related fields Team members have great knowledge in mechatronics, energy, renewable energy and related fields. Thus the research base in process control, electronic parts and components design, software design (microcontrollers, DSP, FPGA, PLC etc.), embedded systems, mechanical design, energy efficiency, energy audit, energetic management, sensor network, management and control of industrial processes etc. is assured.
Consulting	Consulting in any of the fields above mentioned may be done Due to a close collaboration with the productive sector, the research team is capable of collaboration with various industrial partners in order to subcontract any applied engineering services and products.
Training	The members of the team are accredited trainers and have a vast experience in the educational field (academics). Also, the team has experience in the development of the professional formation and reorientation trainings for adults.

TESTING, RESEARCH CERTIFICATION OF INTERNAL COMBUSTION ENGINES WORKING ON BIOFUELS LABORATORY

Contact details

Name	Testing, Research and Certification of Internal Combustion Engines Laboratory
Acronym	TestEcoCel
Logo	
Site	http://www.testecocel.utcluj.ro/
Tüv Certificate	No. S-120.99.241.00, given on 19.12.2012 for ISO 8178, Part 1,3 and 5
Address	103-105 Muncii Blvd., Cluj-Napoca, Romania
Faculty Department	Faculty of Mechanical Engineering Automotive and Transportation Department
Telephone	+40 264 415486 +40 264 401709
Fax	+40 264 415 486
Director	Prof. Dr. Eng. Nicolae Burnete
e-mail	nicolae.burnete@auto.utcluj.ro



Areas of expertise

Engine testing:

In the TestEcoCel Laboratory a series of functional, reliability and dynamic analysis can be performed on internal combustion engines designed for vehicles, powered by conventional fuel and also non conventional fuels.

Testing the quality of fuels on engines:

An analysis of the physical and chemical properties of fuels used in internal combustion engines can be made, and also the evaluation of pollutant emissions generated in the burn process.

Optical analysis of the combustion:

Using an endoscopic camera and the transparent components of the single cylinder research engine inside the Laboratory, some tests regarding the characteristic phenomenon of the combustion process can be made, based on the particularities of the burning flame generated by the different fuels used to powered the internal combustion engine.

Hardware in the loop testing

Using the engine mounted on the testbed, and a virtual environment, the team can implement different driving techniques, roads, manoeuvres, vehicles and the real system (engine) can be compared to a simulation version and validate its functionality. Also acceleration tests can be implemented.

Team

Prof. Dr. Eng. Nicolae Burnete, Prof. Dr. Eng. Bogdan Varga, Prof. Dr. Eng. Florin Mariaşiu, Assoc. Prof. Dr. Eng. Dan Moldovanu, Lect. Dr. Eng. Calin Iclodean, Lect. Dr. Eng. Nicolae Vlad Burnete, Lect. Dr. Eng. Levente Kocsis.

Representative projects

“Cooperation with Porsche Engineering”, Industry research, (2016-2019)

“Cooperation with LUK Oil Romania”, Industry research, (2019)

“Endurance testing of various gasoline blends mixed with metallic additives”, Industry research, (2012-2013)

TestEcoCel, “Testing laboratory of internal combustion engines that run on biofuels”, POS CCE, (2009-2011)

“The influence or the energetic contribution on functional parameters and emissions of internal combustion engines that work with blends of biofuels”, (2007-2009)

EnergEcoFarm, “Studies regarding the usage of oil based fuels as a reliable energy source for agricultural farms”, PN II-21046, (2007-2009)

BIOBENZ, “New, modern, unconventional technologies of superior biomass capitalization from sugar beet – obtaining gasoline”, (2006-2008)

BIOGEF, "High energetic efficiency technology for producing an integrated biogas system and electrical energy from bio mass, for Romanian farms", (2006-2008)
ECOTRANS, "Possibilities and limits of greening urban transportation through vegetable oil fuels", CEEEX Program, (2005-2008)

Significant results

The most representative publications of the past 5 years:

1. Mattson, J., Burnete, N. V., Depcik, C., Moldovanu, D., & Burnete, N. (2019). Second law analysis of waste cooking oil biodiesel versus ULSD during operation of a CI engine. *Fuel*, 255, 115753.
2. Burnete, N. V., Balint, R. J., Măgherusan, C. A., & Moldovanu, D. (2019, October). Performance, Combustion and Emissions Study of a DI Diesel Engine Running on Several Types of Diesel Fuels. In *SIAR International Congress of Automotive and Transport Engineering: Science and Management of Automotive and Transportation Engineering* (pp. 153-159). Springer, Cham.
3. Varga, Bogdan Ovidiu; Sagoian, Arsen; Mariasiu, Florin, Prediction of Electric Vehicle Range: A Comprehensive Review of Current Issues and Challenges ENERGIES Volume: 12 Issue: 5 Article Number: 946 Published: MAR 1 2019
4. Varga, Bogdan Ovidiu; Mariasiu, Florin, INDIRECT ENVIRONMENT-RELATED EFFECTS OF ELECTRIC CAR VEHICLES USE ENVIRONMENTAL ENGINEERING AND MANAGEMENT JOURNAL Volume: 17 Issue: 7 Pages: 1591-1597 Published: JUL 2018
5. Burnete, N. V.; Burnete, N.; Jurchis, B.; et al., Influences of diesel pilot injection on ethanol autoignition - a numerical analysis INTERNATIONAL CONGRESS OF AUTOMOTIVE AND TRANSPORT ENGINEERING - MOBILITY ENGINEERING AND ENVIRONMENT (CAR2017) Book Series: IOP Conference Series-Materials Science and Engineering Volume: 252 Article Number: UNSP 012066 Published: 2017
6. Iclodean, C.; Varga, B.; Burnete, N.; et al., Comparison of Different Battery Types for Electric Vehicles INTERNATIONAL CONGRESS OF AUTOMOTIVE AND TRANSPORT ENGINEERING - MOBILITY ENGINEERING AND ENVIRONMENT (CAR2017) Book Series: IOP Conference Series-Materials Science and Engineering Volume: 252 Article Number: UNSP 012058 Published: 2017
7. F. Mariasiu, N. V. Burnete, D. Moldovanu, B. O. Varga, C. Iclodean, and L. Kocsis, "EFFECTS OF BIOETHANOL ULTRASONIC GENERATED AEROSOLS APPLICATION ON DIESEL ENGINE PERFORMANCES," *Thermal Science*, vol. 19, pp. 1931-1941, 2015.
8. Varga BO, Mariasiu F, Moldovanu D, Iclodean C. Electric and Plug-In Hybrid Vehicles. Cham: Springer International Publishing; 2015.

Significant solutions:

Research regarding the use of rape seed oil based fuels with diesel, for the compression ignited engine, to reduce pollution; Studies regarding combustion modeling in a compression ignited engine fueled with biodiesel for better performance; Studies and research regarding simulation of an internal combustion engine that works with biofuels; Studies and research regarding the possibilities of improving the internal combustion engine performance through supercharging;

Products and technologies:

Active Dynamometer – capable of functioning also as a motor, for starting the single cylinder engine, capable of working at 12000 rot/min, developing a power of 220kW and a torque of 540Nm; and capable of working as a controlled generator, for loading the engine; Single cylinder research engine – the engine has three interchangeable kits: Kit for gasoline engine, for direct injection and indirect injection (PFI); Kit for transparent engine, with a quartz liner in order to film inside the combustion chamber using cameras and a quartz cylinder head, for filming using the camera and a mirror system; Kit for Diesel engine, common rail, direct injection, with two orifices in the cylinder head for the endoscopic camera, to film the processes inside the combustion chamber; Open ECU – the Electronic Control Unit of the engine, Hardware in the Loop system

Patents:

Mariasiu E, Burnete N, Varga B., Cold start device for internal combustion engines supplied with biodiesel fuel, RO127032-A2

Mariasiu Florin Emil, Varga Bogdan Ovidiu, Deac Teodora Alexandra, Device For Reducing Lube Oil Viscosity Upon Start Of Internal Combustion Engines At Reduced Ambient Temperatures, 128768 / RO128768-A2 / a 2011 01383 - 2016

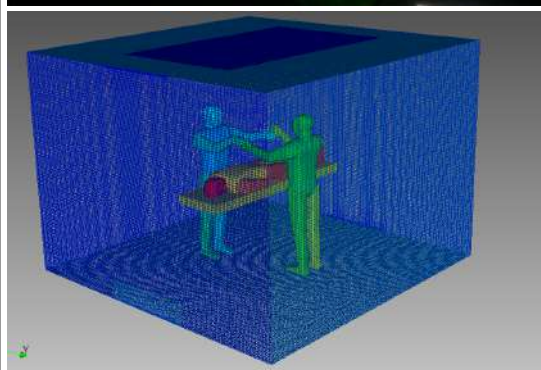
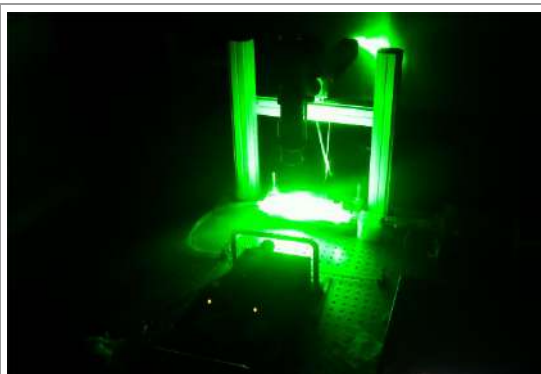
The offer addressed to the economic environment

Research & development	In the applied engineering service domain, our research group offers technical expertise regarding the dynamic performance, chemical and nuisance while using different types of fuels for the internal combustion engines; Modeling and analysis of the combustion process of an internal combustion engine using different types of fuels; Analysis of biodiesel burn particularities in a compression ignited engine and study of bio-ethanol burn performance in a spark ignited engine.
Consulting	In the consulting domain, our research group can provide data regarding fuel performance and internal combustion engine performance to internal combustion engine producers, to fuel producers and also for research centers. The internal combustion engine is tested as if it is mounted on the vehicle, due to the high performance of the dynamometer.
Training	The available trainings are in Engine testing, Engine certification, and Fuel testing domain.

ADVANCED FLOW AND HEAT TRANSFER INVESTIGATION GROUP

Contact details

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Faculty Department	Faculty of Mechanical Engineering Mechanical Engineering Department
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Areas of expertise

Biomedical Engineering

- Flows through Bypass Grafts and Mechanical Heart Valves - numerical (CFD) and experimental investigations (PIV)

Heat and Mass Transfer

-Free and Impinging Jets with application in Personalized Ventilation; Heating Ventilation and Air Conditioning; Heat Transfer; Combustion: reactive and non reactive flows – numerical (CFD), experimental investigations

Fluid Flow Control Systems

- Design and manufacture of controllers for fluid systems; Sensorics; Analyse and signal processing

Team

Assist. Prof. Dr. Eng. Corina Giurgea, Prof. Dr. Eng. Victor Hodor, Assoc. Prof. Dr. Eng. Florin Bode, Assist. Prof. Dr. Eng. Lucian Nascutiu, Assist. Dr. Eng. Daniel Banyai, Dr. Med. Octavian Ioan Budiu

Representative projects

INSIDE, “Innovative strategies of HVAC systems for high indoor environmental quality in vehicles”, PN-II-PT-PCCA, <http://cambi.ro/inside/> (2014-2017)

EQUATOR, “Advanced strategies for high performance indoor Environmental QUALiTy in Operating Rooms”, PN-II-PT-PCCA, <http://cambi.ro/equator/index.html> (2012-2016)

“Fluid dynamics analysis for innovative personalized ventilation diffusers for automotive and building applications”, PN-II-RU-PD, <http://www.cambi.ro/ventilare-personalizata-pd-bode/index.html> (2011-2013)

MAACH, “Advanced Methods of Analysis and Control in Hemodynamics, with applications in peripheral vascular surgery”, CNMP PN-II- (Complex Partnership Project),

<http://www.cnmp.ro:8083/pncdi2/program4/documente/2010/sedinta/rez/D8/82-086.pdf> (2008-2011)

“The control and numerical analysis of combustion instability by using the acoustic analogy”, CNCSIS PN II, http://www.termo.utcluj.ro/pncd2_2007_IDEI/ (2007-2010)

SHATEMP, “Adaptive hydraulic systems for small-scale wind turbines”, CNMP PN-II(Complex Partnership Project), <http://shatemp.tuiasi.ro/> (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Florin BODE, Amina MESLEM, Claudiu PATRASCU, Ilinca NASTASE, “Flow and wall shear rate analysis for a cruciform jet impacting on a plate at short distance”, Progress in Computational Fluid Dynamics, An Int. J., Accepted for publication in 30.08.2019, 2020

2. Ionut Voicu, Rania Rizk, Hasna Louahlia, Florin Bode, Hamid Gualous, "Experimental and numerical study of supercapacitors module with air-cooling", Applied Thermal Engineering, <https://doi.org/10.1016/j.applthermaleng.2019.113903>, IF.4.026, vol. 159, August 2019
3. Boldizar, Razvan Alin; Ordean, Mihaela; Giurgea, Corina, Designing, Implementing and Testing the Acoustic Component of a Text to Speech System for the Romanian Language Conference: 15th International Conference on Informatics in Economy (IE 2016), Education, Research & Business Book Series: Lecture Notes in Business Information Processing Volume: 273 Pages: 101-114 Published: 2018
4. C. V. Croitoru, I. Nastase, F. I. Bode, and A. Meslem, "Thermodynamic investigation on an innovative unglazed transpired solar collector", *Solar Energy*, vol. 131, pp. 21-29, Jun 2016.
5. Corina Giurgea, Florin Bode, Lucian Nascutiu, Cristian Dulescu, "Considerations Regarding the Optically Transparent Rigid Model for PIV Investigations. A Case Study. Part 2: Notes on the Failure of the Model", in *Energy Procedia* 85 (2016) 235 – 243, 2016
6. Lucian Nascutiu, Corina Giurgea, Mihai Damian, Florin Bode, Octavian Budiu, Octavian Andercou, "Considerations Regarding the Optically Transparent Rigid Model for PIV Investigations. A Case Study. Part1: Model Manufacturing", in *Energy Procedia* 85 (2016) 358 – 365, 2016
7. Victor Hodor, Dan Birle, Lucian Nascutiu, Mircea Diudea, "CFD Prediction with LES for Psycho Acoustic Relevance in Ventilation", in *Energy Procedia* 85 (2016) 252 –259, 2016
8. Cristiana Croitoru, Ilinca Nastase, Florin Bode, Amina Meslem, Angel Dogeanu, "Thermal comfort models for indoor spaces and vehicles - Current capabilities and future perspectives", in *Renewable and Sustainable Energy Reviews*, 44 (2015) 304–318, 2015
9. Kodjovi Sodjavi, Brice Montagné, Pierre Bragança, Amina Meslem, Florin Bode, Magdalena Kristiawan, "Impinging cross-shaped submerged jet on a flat plate: a comparison of plane and hemispherical orifice nozzles", in *Meccanica*, Volume 50, Issue 12, pp 2927-2947, 2015
10. Lucian Nascutiu, Olivier Reinertz, Christoph Siebert, Hubertus Murrenhoff, "High Performance Actuators for Fluid Power Drives", *The 9TH INTERNATIONAL FLUID POWER CONFERENCE IFK2014*, Vol. III, 242-253, Aachen, Germany, March 2014.

Significant solutions:

High accuracy mapping of the flow fields by using PIV and CFD investigations with possible future applications for: the graft geometry optimization (flow through a femoral artery bypass) respectively the nozzle design optimization(in Personalized Ventilation)

Products and technologies:

A technology for manufacturing optically transparent models suited to PIV investigations. The models consist of idealized bifurcations or axisymmetric channels machined in blocks of Plexiglass with a high degree of transparency and refractive index that could be matched with that of certain working fluids (Technology developed in cooperation with colleagues from the Department of Machine Building of the UTCN).

An experimental setup integrating a flow circuit reproducing the flow through a femoral artery bypass and a 2D PIV system that would allow the investigation by the PIV method of pulsating flows similar to those in a segment of the human circulatory system

Others:

Creation of a laboratory that provides appropriate conditions (darkroom, flat surfaces, optical table and devices, 2D PIV system, experimental setups) for flow investigations through optical methods

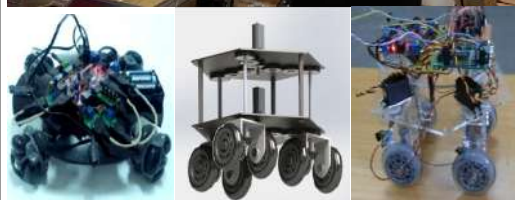
The offer addressed to the economic environment

Research & development	Providing support (expertise and facilities) for research in connected fields like: hemodynamics, biomedical flows, thermo-gas-dynamics/combustion by the complementary use of CFD techniques and optical PIV methods. Developing/upgrading the experimental setup used to investigate the pulsed flows similar to that through a bypass (currently in the experimental model stage) with a view toward potential use in testing vascular prostheses Designing and machining customized optically transparent models of axisymmetric channels and bifurcations appropriate for PIV investigations Developing solutions for PV (Personalized Ventilation) and HVAC (Heating Ventilation and Air Conditioning) based on CFD numerical simulations Measuring viscosities for a wide range of fluids, including non-Newtonian fluids, and low viscosity fluids (e.g. possible beneficiaries in cosmetics or pharma industries) Measuring parameters for monitoring the indoor air quality (temperature, humidity, air velocity, CO2 concentrations)
Consulting	Consulting and technical support for designing, building and evaluation of thermo-energy and combustion equipment Technical and judicial expertise in the area of: using thermal equipment and combustion
Training	Courses for providing surgeons with a new approach to reconstructive bypass surgery from the engineering perspective. Introductory course in numerical simulation of fluid flow and heat transfer for undergraduate students and students at the M.Sc, doctoral and postdoc level (2018-2019: 10 Undg. St. + 3M.Sc.St. + 1 PhD St +1 postdoc.) Initial training in in PIV optical measurement techniques for students at the M.Sc. and doctoral level.

INTELLIGENT RECONFIGURABLE SYSTEMS LABORATORY

Contact details

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Areas of expertise

Advanced Technologies for Industrial Process Control
 Identifying and modeling highly complex processes
 New paradigms of manufacturing systems
 Technologies and High Precision Mechanical Products and Mechatronic Systems
 Applied mechatronics; Intelligent mechatronic products and systems
 Techniques, metrologies and precise and highly precise measuring instruments
 Conventional and unconventional automatic drive systems and equipment, with accurate and highly accurate linear or angular positioning
 Robotics and high precision microrobotics with or without autonomous motions
 High accuracy conventional and unconventional production techniques
 Assembly technologies, microassembly, rapid assembly and high accuracy automatic disassembly
 Innovative Products and Technologies for Transport and Automotive Industry
 Products and technologies for automotive industry
 Development of New Types of Mechanical Transmissions
 Cylindrical and frontal ball transmissions
 Processional variable speed
 Diagnosis and maintenance of Industrial Equipment
 Technologies for vibration reduction in dynamic systems
 Predictive maintenance systems

Team

Prof. Dr.-Ing. Cornel Brisan, Prof. Dr. Eng. Mircea Bara, Prof. Dr. Eng. Mihai Olimpiu, Assist. Prof. Dr. Eng. Calin Rusu, Conf.dr.ing. Olimpiu Hancu, Sl.dr.ing. Lapusan Ciprian, Asist.dr.ing. Rad Ciprian, Ddr. Trif Mihaela

Representative projects

SIRAMAD – “Autonomous robotic systems for waste management in the context of the intelligent city”, PNIII-P1-1.2 PCCDI 2018, (2018-2020)
“Research concerning theoretical development and experimental validation of Reconfigurable Haptic Interfaces for Virtual Reality”, Alexander von Humboldt Foundation (2012-2015)
“Reconfigurable haptic interfaces used in dynamic contact reproduction - Theory Developmentsethical and

experimental”, PNII-PT-PCCA-2011-3.1-0190, (2012-2016)
 “Research concerning development of machine tools with reconfigurable topology”, Grant ANCS Idei (2007-2010)
 “Research and development of the high accuracy positioning robotic systems with extended mobility”, Grant ANCS, (2007-2010)
 “Modeling, simulation and realization of mobile minirobots with adaptable structure”, Grant type A CNCSIS, (2006-2007)
 “Modelling, simulation and development of robotic system families used for inspection and exploration”, Grant PN-II-Idei, (2007-2010)
 “Mathematical Modeling and Experimental Research on Anthropomorphic Parallel Robots”, Alexander von Humboldt Foundation, (2004-2008)

Significant results

The most representative publications of the past 5 years:

1. Brisan C., Introduction in optimisation of Industrial Robotics. Theory and Applications. Ed Academiei Romanne, 2019.
2. C Lapusan, M Lapusan, C Brisan, V Chiroiu, [Aspects relating to development of modular design in mass customization production](#), PROCEEDINGS OF THE ROMANIAN ACADEMY OF THE ROMANIAN ACADEMY, Series A, Volume 20, Number 4/2, 2019, pp. 377–382.
3. C Boanta, C Brisan [Optimization of a Robot Used for a Solid Waste Selection System](#), International Journal of Modeling and Optimization 9 (6), 2019.
4. 1. Tatar M.O., Pecie R. - Modular omnidirectional mobile robot with four driving and steering wheels, IOP Conference Series: Materials Science and Engineering, vol. 514, 2019, p 012019, doi:10.1088/1757-899X/514/1/012019.
5. Gyarmati, M., Tătar M.O., - Locomotion systems for search and rescue robots, Revista Robotica & Management, ISSN 1453-2069, Vol. 24, nr. 1, 2019, pp. 8-13.
6. Tătar, M.O., Barbu, P., - Studies regarding mobile robots that are adaptable to rough terrain, Revista Robotica & Management, ISSN 1453-2069, Vol. 24, nr. 1, 2019, pp. 24–29.
7. Chiroiu, Veturia; Brisan, Cornel; Dumitriu, Dan; et al., A sonification algorithm for developing the off-roads models for driving simulators MECHANICAL SYSTEMS AND SIGNAL PROCESSING Volume: 98 Pages: 310-323 Published: JAN 1 2018
8. Munteanu, Ligia; Brisan, Cornel; Chiroiu, Veturia; et al., STRAIN AMPLITUDE DEPENDENT INTERNAL FRICTION AND THE YOUNG'S MODULUS DEFECT IN DAMAGED SOLIDS ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 60 Issue: 4 Pages: 485-490 Published: NOV 2017
9. Chiroiu, Veturia; Munteanu, Ligia; Dumitriu, Dan; et al., ON THE SONIC FILMS WITH DEFECTS PROCEEDINGS OF THE ROMANIAN ACADEMY SERIES A-MATHEMATICS PHYSICS TECHNICAL SCIENCES INFORMATION SCIENCE Volume: 18 Issue: 4 Pages: 378-385 Published: OCT-DEC 2017
10. Fodor, Ferenc; Brisan, Cornel; Chiroiu, Veturia, The Development of a Pneumatically Actuated Driving Simulator IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR) Location: Cluj Napoca, ROMANIA Date: MAY 19-21, 2016 Book Series: IEEE International Conference on Automation Quality and Testing Robotics Pages: 185-190 Published: 2016
11. L. Munteanu, V. Chiroiu, C. Brisan, D. Dumitriu, T. Sireteanu, and S. Petre, "On the 3D normal tire/off-road vibro-contact problem with friction", *Mechanical Systems and Signal Processing*, vol. 54-55, pp. 377-393, Mar 2015.
12. L. Munteanu, C. Brisan, V. Chiroiu, D. Dumitriu, and R. Ioan, "Chaos-hyperchaos transition in a class of models governed by Sommerfeld effect", *Nonlinear Dynamics*, vol. 78, pp. 1877-1889, Nov 2014.
13. L. Munteanu, V. Chiroiu, S. Donescu, and C. Brisan, "A new class of sonic composites", *Journal of Applied Physics*, vol. 115, Mar 2014.
14. V. Chiroiu, C. Brisan, M. Popescu, I. Girip, L. Munteanu, "On the sonic composites without/with defects", in *J. Apply Phys.*, vol. 114, 2013
15. C. Brisan, R.V. Vasiiu, L. Munteanu, "A Road Auto-Generating Algorithm for Developing the Road Virtual Models Usable in Driving Simulators", in *Transportation Research Part C: Emerging Technologies*, vol. 26, 2013, pp.160-179

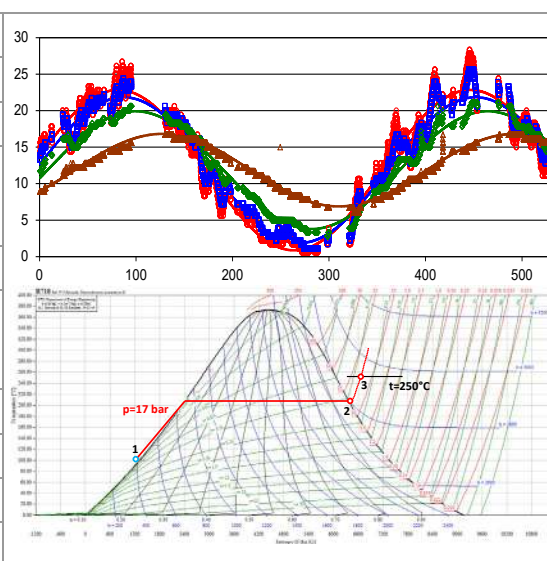
The offer addressed to the economic environment

Research & development	Modeling complex intelligent systems. Developing robotic systems for manufacturing Development robotic inspection systems Development omnidirectional mobile robots Developing virtual models
Consulting	For automated manufacturing systems For precision mechanical systems Pipe inspection
Training	Computer aided design and development of mechatronic systems Development of manufacturing technologies Vibratory systems analysis Control algorithms for robots

INSTRUMENTAL ANALYSIS

Contact details

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Acronym	IA
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Telephone	+40 745 014725
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Director	Prof. Dr. Eng. Mugur Ciprian Balan
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Areas of expertise

Fundamental research fields: Chemistry, Environment and materials science; Biology, Genetics and medicine; Physics and Technological physics; Fields at frontier

Applied research fields: Theoretic computer science; Advanced informatics systems; Sustainable energy systems; Energy security; Pollution reduction; Alimentary safety and security; Biotechnology

Team

Prof. Dr. Eng. Mugur Ciprian Balan, Prof. Dr. Lorentz Jantschi, Assoc. Prof. Dr. Eng. Paula Veronica Ungureșan, As. Dr. Eng. Ancuta Magurean

Representative projects

SIRCLES - Replicable large impact Symbiotic value chains for cross sectoral optimization of resource efficiency and circularity in Energy Intensive Industries (2020)

<http://mugurbalan.eu/doc/SIRCLES.pdf>

PVEFF - Increased energy efficiency in municipal buildings through the use of photovoltaic panels (2019)

http://www.mugurbalan.eu/doc/pv_utcn.pdf

LCGM - Technical and economic study about the combustion and utilisation aspects of the low calorific gas mixtures (2019)

<http://mugurbalan.eu/doc/LCGM.pdf>

REMSIS - Renewable energy management system for small isolated communities (2014-2017)

<http://remsis.utcluj.ro/>

Significant results

The most representative publications of the past 5 years:

1. Abrudan, A.C., Pop, O.G., Serban, A., Bălan, M.C. - *New Perspective on Performances and Limits of Solar Fresh Air Cooling in Different Climatic Conditions*, Energies, 12(11) (2019), pp. 1-21, ISSN: 1996-1073 (IF: 2.707 / 2018) <https://www.mdpi.com/1996-1073/12/11/2113>
2. Pop, O.G., Fechet Tutunaru, L., Bode, F., Abrudan, A.C., Bălan, M.C. - *Energy efficiency of PCM integrated in fresh air cooling systems in different climatic conditions*, Applied Energy, 212 (2018) pp. 976-996, ISSN: 0306-2619 (IF: 7.900 / 2017), <https://doi.org/10.1016/j.apenergy.2017.12.122>
3. Ungureșan, P.V., Porumb, R.A., Petreș, D., Pocola, A.G., Pop, O.G., Bălan, M.C. - *Orientation of façades for active solar energy applications in different climatic conditions*, Journal of Energy Engineering, 143(6) (2017): 04017059:1-11 (IF: 1.944 / 2016), [https://doi.org/10.1061/\(ASCE\)JEEY.1943-7897.0000486](https://doi.org/10.1061/(ASCE)JEEY.1943-7897.0000486)
4. Neamtu, M.O., Bălan, M.C., Petreș, D., Leuca, T., Trip, N.D. - *Considerations on a geothermal electric power generator based on organic Rankine cycle as a part of a smart-grid*, Revue roumaine des sciences techniques - Série Électrotechnique et Énergétique, 62(4) (2017), pp. 431-435, ISSN: 0035-4066 (IF: 1.036 / 2016), <http://revue.elth.pub.ro/viewpdf.php?id=715>
5. Todoran, T.P., Bălan, M.C. - *Long term behavior of a geothermal heat pump with oversized horizontal collector*, Energy and Buildings, 133 (2016), pp. 799-809 (IF: 4.067 / 2016), <http://dx.doi.org/10.1016/j.enbuild.2016.10.037>
6. Petreș, D., Bălan, M.C., Pop, O.G., Etz, R., Patrau, T. - *Evaluation of the PV energy production determined by measurements, simulation and analytical calculations*, E3S Web of Conferences 85 (2019) pp. 1-8., <https://doi.org/10.1051/e3sconf/20198504002>

7. Pop,O.G., Iuga,C.A., Fechete Tutunaru,L.V., Bălan,M.C. - *Modeling and experimental validation of the thermal behavior of PCM using DSC input data*, The 3rd Joint International Conference on Energy Engineering and Smart Materials (ICEESM-2018) and International Conference on Nanotechnology and Nanomaterials in Energy (ICNNE-2018), AIP Conf. Proc. 2004, 020005-1–020005-7, <https://doi.org/10.1063/1.5051100>
8. Pop,O.G., Abrudan,A.C., Dogeanu,A.M., Pocola,A.G., Fechete Tutunaru,L.V., Bălan,M.C. - *Dynamic thermal modeling of buildings and application to a hospital*, 2018 IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR), Cluj-Napoca, 24-26 May (2018) pp. 1-6, DOI: 10.1109/AQTR.2018.8402769
9. Pop,O.G., Abrudan,A.C., Adace,D.S., Pocola,A.G., Bălan,M.C. - *Potential of HVAC and solar technologies for hospital retrofit to reduce heating energy consumption*, E3S Web of Conferences 32 (2018) pp. 01016: 1-
<https://doi.org/10.1051/e3sconf/20183201016>
10. Pop,O.G., Fechete Tutunaru,L.V., Bode,F., Bălan,M.C. - *Preliminary investigation of thermal behaviour of PCM based latent heat thermal energy storage*, E3S Web of Conferences 32 (2018) pp. 01017: 1-8,
<https://doi.org/10.1051/e3sconf/20183201017>
11. Porumb,R.A., Porumb,B.A., Bălan,M.C. - *Numerical investigation on solar absorption chiller with LiBr-H₂O operating conditions and performances*, Energy Procedia 112 (2017) pp. 108-117,
<http://dx.doi.org/10.1016/j.egypro.2017.03.1071>
12. Pop,O.G., Fechete Tutunaru,L.V., Bălan,M.C. - *Numerical model for solidification and melting of PCM encapsulated in spherical shells*, Energy Procedia 112 (2017) pp. 329-336,
<http://dx.doi.org/10.1016/j.egypro.2017.03.1060>
13. Pocola,A.G., Serban,A., Bălan,M.C. - *Complex and efficient waste heat recovery system in aluminum foundry*, Energy Procedia 112 (2017) pp. 497-502, <http://dx.doi.org/10.1016/j.egypro.2017.03.1134>
14. Tacutu,L., Pocola,A., Bălan,M.C., Iordache,V. - *Acoustic measurements for two configurations of acoustic casings with applications on ambient noise pollution*, International Conference on Energy and Environment (CIEM), Bucharest (2017) pp. 129-133.,
<http://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=8120849&isnumber=8120754>
15. Pop,O.G., Bălan,M.C. - *Assessments about calculation of the PCM's phase change temperature in the climatic conditions of Romania*, Termotehnica, Supl. 1 (2016), pp. 37-42, <http://www.agir.ro/buletine/2647.pdf>
16. Porumb,B.A., Bălan,M.C., Porumb,R.A., - *Potential of indirect evaporative cooling to reduce the energy consumption in fresh air conditioning applications*, Energy Procedia, 85 (2016), pp. 433-441,
<http://dx.doi.org/10.1016/j.egypro.2015.12.224>
17. Boțu,R.A., Porumb,B.A., Bălan,M.C. - *Baseline evaluation of potential to use solar radiation in air conditioning applications*, Energy Procedia, 85 (2016), pp. 442-451, <http://dx.doi.org/10.1016/j.egypro.2015.12.225>
18. Porumb,B.A., Ungureșan,P.V., Fechete Tutunaru,L.V., Serban,A., Bălan,M.C. - *A review of indirect evaporative cooling technology*, Energy Procedia, 85 (2016), pp. 461-471, <http://dx.doi.org/10.1016/j.egypro.2015.12.228>
19. Porumb,B.A., Ungureșan,P.V., Fechete Tutunaru,L.V., Serban,A., Bălan,M.C. - *A review of indirect evaporative cooling operating conditions and performances*, Energy Procedia, 85C (2016), pp. 452-460,
<http://dx.doi.org/10.1016/j.egypro.2015.12.226>
20. Ungureșan,P.V., Petreuş,D., Pocola,A.G., Bălan,M.C. - *Potential of solar ORC and PV systems to provide electricity under Romanian climatic conditions*, Energy Procedia, 85 (2016), pp. 584-593

Patents:

M. C. Bălan, et al. : RO126148B1: Heat pump to provide heating temperature at two different levels. Owner: SC Convergo SRL

The offer addressed to the economic environment

Research & development	R&D in the fields of: Energy efficiency, Renewable energies, Chemistry; Computer science; Mathematics; Physics; Horticulture; Biotechnologies; Experimental design; Data acquisition, Computational fluid dynamics, Cogeneration
Consulting	Consulting in the fields of: Energy efficiency, Renewable energies, Chemistry; Computer science; Mathematics; Physics; Horticulture; Biotechnologies; Experimental design; Data acquisition, Computational fluid dynamics, Cogeneration
Training	Training in the fields of: Energy efficiency, Renewable energies, Chemistry; Computer science; Mathematics; Physics; Horticulture; Biotechnologies; Experimental design; Data acquisition, Computational fluid dynamics, Cogeneration

ADVANCED MECHATRONIC SYSTEMS LABORATORY

Contact details

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e-mail	Sergiu.Stan@mdm.utcluj.ro



Areas of expertise

Advanced Mechatronic Systems:

- **Virtual Reality:** design mechatronic systems with the assistance of virtual reality technology, which can benefit clearly from immersion and 3D. This virtual reality-based approach can be applied for the testing of intelligent mechatronic systems. Virtual reality facilitates the analysis of tests by the combination of virtual 3D models and visualization techniques.
- **Optimal design and control of parallel robots:** Parallel robots present better performances in comparison with serial robots. However, due to the strong dependence of geometric parameters and their performances, the corresponding design problems for the parallel robots are much more complex and the adequacy and effectiveness of the design method become more critical. In order to overcome this genetic algorithm optimization can be applied.
- **Haptic devices and Exoskeletons:** these mechatronic systems can be used for virtual reality and tele-presence applications. The development of even more capable devices that can accurately reproduce a large range of haptic information is an important component for the technologies of virtual reality and tele-presence. Exoskeletons can bring up a valuable contribution to the applications where the workspace is strategic.
- **Mechatronics research and training:** current research includes development of concepts, algorithms, theories, and methodologies for synergistic integration of precision mechanical engineering with advanced electronics and computer control in the design of mechatronic systems.
- **Advanced programming in MATLAB:** advanced topics like GUIs/APPs, Simulink/Simscape, interfaces with Arduino/Raspberry Pi & QUANSEER control boards, ROS with MATLAB.

Team

Assoc. Prof. Dr. Eng. Sergiu-Dan Stan, Senior lecturer Dr. Eng. Emil Teușan, Assist. Prof. Dr. Eng. Alin Plesa, Assist. Prof. Dr. Eng. Alexandru Ianosi, Eng. Mihai Dan Rusu, Assist. Prof. Dr. Eng. Ionut Muntean

Representative projects

EXORAS. "New Haptic Arm Exoskeletons for Robotics and Automation in Space" (2012-2015). National project, the project seeks to develop in Romania capacity building at national level and to stimulate Romania's participation to international space missions and programs – in particular ESA, in the field of Robotic Exploration. The impact will be to develop new haptic arm exoskeleton to enable in-space force-feedback telemanipulation with redundant robotic arms, and so help enable new policies in Romania such as robotic exploration, as well as supporting Romania towards increased participation to ESA programs.

GREENet. "Globally Recoverable and Eco-friendly E-equipment Network with Distributed Information Service Management" (2011-2014). European FP7 project, aimed to establish closer international cooperation and to share and develop research on globally sustainable Waste Electrical and Electronic Equipment (WEEE) management is timely and significant. This GREENet project is aimed at teaming up multi-disciplinary research teams from the EU and China to enhance the knowledge base and achieve research synergies as integrated technical solutions in the relevant areas.

SMART. "Complex mechatronic systems for medical applications" (2008-2011). National project, the project aimed of realization of integrated, innovative system regarding the complex mechatronic systems for medical applications.

CLEM. "CLOUD services for E-learning in Mechatronics technology" (2012-2013). European project, Leonardo da Vinci Development of Innovation type, the CLEM project is the first step to fulfil the vision of establishing "a global

Mechatronics technology in VET knowledge repository for exchange and sharing".

MIND. Development of mechatronics skills and innovative learning methods for Industry 4.0 (2019-2021).

XP2P. Crossing Borders: Peer-to-Peer Education in Mechatronics (2019-2022).

SMART2. "Advanced integrated obstacle and track intrusion detection system for smart automation of rail transport" (2019-2022). SMART2 research on-board long-range all-weather obstacle detection (OD) and track intrusion detection (TID) system. 2 new systems will be also researched, innovate and developed: advanced SMART2 trackside (TS) /airborne OD&TID systems. All 3 systems will be integrated into a holistic OD&TID system via interfaces to central Decision Support System (DSS). **AMS laboratory** responsible for airborne OD&TID system.

Significant results

The most representative publications of the past 5 years:

1. Teutan, Emil; Rafa, Vasile, ANALYSIS AND FUZZY SIMULATION OF A PUMP WITH ECCENTRIC FOR NATURAL GASES ODORIZED ACTA TECHNICA NAPOCENSIS SERIES-APPLIED MATHEMATICS MECHANICS AND ENGINEERING Volume: 61 Issue: 1 Pages: 55-60 Published: MAR 2018
2. Tatar, Mihai Olimpiu; Petre, Barbu; Teutan, Emil, Design and Development of the Hybrid Mobile Robots 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj-Napoca, ROMANIA Date: MAY 24-26, 2018 Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
3. Verba, Nandor; Chao, Kuo-Ming; James, Anne; et al., Platform as a service gateway for the Fog of Things ADVANCED ENGINEERING INFORMATICS Volume: 33 Pages: 243-257 Published: AUG 2017
4. Lovasz, Erwin-Christian; Margineanu, Dan Teodor; Ciupe, Valentin; et al., Design and control solutions for haptic elbow exoskeleton module used in space telerobotics MECHANISM AND MACHINE THEORY Volume: 107 Pages: 384-398 Published: JAN 2017
5. A. Paljanos, S. Miclaus, P. Bechet, and I. Munteanu, "Assessment of mobile phone user exposure to UMTS and LTE signals: comparative near-field radiated power levels for various data and voice application services", *Journal of Electromagnetic Waves and Applications*, vol. 30, pp. 1101-1115, 2016.
6. Chao, Kuo-Ming; James, Anne E.; Nanos, Antonios G.; et al., Cloud E-learning for Mechatronics: CLEM FUTURE GENERATION COMPUTER SYSTEMS-THE INTERNATIONAL JOURNAL OF ESCIENCE Volume: 48 Pages: 46-59 Published: JUL 2015
7. Racz, AA, Muntean, I., Stan, SD, "A look into electric/hybrid cars from an ecological perspective", *8TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING*, INTER-ENG 2014 Book Series: Procedia Technology Volume: 19 Pages: 438-443 Published: 2015
8. Busu, Alexandra Antonia; Muntean, Ionut; Stan, Sergiu-Dan, „An analysis of the current challenges of WEEE remanufacturing", *8TH INTERNATIONAL CONFERENCE INTERDISCIPLINARITY IN ENGINEERING*, INTER-ENG 2014 Book Series: Procedia Technology Volume: 19 Pages: 444-450 Published: 2015

Products and technologies

1. Real-time control of mechatronic systems
2. Optimal design of parallel robots using genetic algorithms
3. Control of industrial Fanuc robots
4. Design and development of Soft Robotics systems

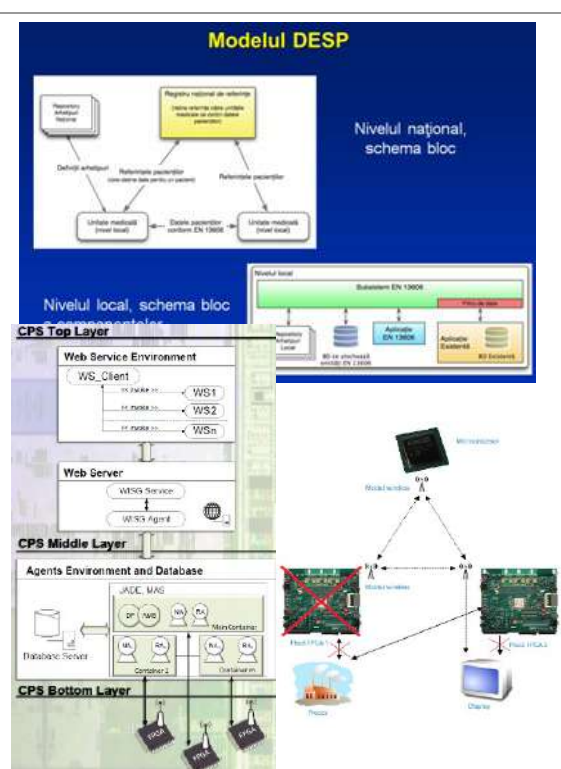
The offer addressed to the economic environment

Research & development	Development of solutions for modelling mechatronic systems. Development of original algorithms for optimization with genetic algorithms of mechatronic systems. Development of solutions for control of CNC machines/ robot systems. Development of airborne OD&TID systems. Design, control and development of Soft Robotics systems.
Consulting	Consulting, design, research and prototyping of mechatronic systems, control of industrial Fanuc robots
Applied engineering services	Custom solutions for specific issues regarding the implementation of mechatronic systems
Training	MATLAB programming: getting started with Matlab, m-files, Graphical User Interfaces, Virtual Reality, Simulink/Simscape Toolbox..etc. Optimal design with Genetic Algorithms: optimization, genetic algorithms, Pareto optimal front, multicriteria optimization. Arduino: hardware, breadboards and prototyping, simple electronic components, Introduction to important programming concepts, software interface with MATLAB. Quanser: teaching platform for controls and mechatronics with MATLAB/Simulink Fanuc robots: hands-on robotics learning for the future of mechatronics and automation, teaching experience of programming and operating cutting-edge industrial Fanuc robots.

DEPENDABLE SYSTEMS

Contact details

Name	Dependable Systems
Acronym	DeSy
Logo	
Site	http://desy.utcluj.ro http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/2_Miclea.pdf
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Director	Prof. Dr. Eng. Liviu Miclea
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Areas of expertise

Dependability. Security.

- Development of intelligent techniques for dependability (availability, reliability, safety, integrity and maintainability), security (confidentiality) and testing of information systems;
- Analysis, design, implementation and testing of information systems with dependability properties used in various fields (e.g. critical infrastructure - energy, water, environment, transport; medicine).

Cyber – Physical Systems (CPSs).

- Development of **ABSTRACT**ions, architectures and tools to allow implementation of reliable CPSs made from unsafe components and resistant CPSs at cyber or physical attacks;
- Development of the semantic basics for heterogeneous models composition and for modelling languages that describe various physical processes of a CPS and their associated logic.

Intelligent Systems.

- Analyse, design, implementation and testing of intelligent real-time control and monitoring systems using artificial intelligence techniques (intelligent agents, fuzzy logic, data mining, etc.).

Team

Prof. Dr. Eng. Liviu Miclea, Prof. Dr. Eng. Honoriu Vălean, Assoc. Prof. Dr. Eng. Enyedi Szilard, Assist. Prof. Eng. Ovidiu Stan, Assist. Eng. Iulia Ștefan
PhD students: Cosmina Corcheș, Donca Ionut Cătălin, Vădan Andrei-Mihai, Vlad Bucur, Andrei Scurtu, Eng. Rareș Coste, Tudor Pop, Eng. Bianca Zaharie

Representative projects

ROBIN – “Robots and Society: Cognitive Systems for Personal Robots and Autonomous Vehicles”, PCDDI2018 (2018-2020)
F2S, “SCADA Federation, Collaborative Instrument for Water Management – Somes River Pilot Application”, National PN2- Partnerships project, <http://193.226.5.107/f2s/pagina/>, (2014-2017)
“Use of commercial drones for autonomous maintenance services in railways”, cooperation with Siemens company, (2013-2016)
“Cluj-Napoca: Next Generation Brained City - Software design for service monitoring at the level of the medical network, through innovative solution integration”, Sectoral Operational Programme “Increase of Economic Competitiveness” (POSCCE) project, http://clujit.ro/ro/#Next_Generation_Brained_City, (2014-2015)
ProSEco, “Collaborative environment for design of Aml enhanced product-services integrating highly personalised innovative functions with minimal ecological footprint along life cycle and of their production processes based on collaborative environments”, European FP7 project, http://cordis.europa.eu/projects/rcn/109191_en.html, (2013-2017)

CyCloSe, “Designing Cloud-based Self-healing Cyber-Physical Systems”, Romania–Italy Bilateral Cooperation with Politecnico di Torino, (2013-2014)
DESP, “Electronic Healthcare Record”, National PN2- Partnerships project,
<http://www.desp.ro/wiki/index.php/English>, (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. Vlad Bucur, Ovidiu Stan, Liviu Miclea, „Data Loss Prevention and Data Protection in Cloud Environments based on Authentication Tokens”, 2019 22nd International Conference on Control Systems and Computer Science (CSCS), Bucharest, Romania Date: May 28-30, 2019, pp. 720-725, DOI: 10.1109/CSCS.2019.00128
2. 4. Ovidiu Stan, Liviu Miclea, „New Era for Technology in Healthcare Powered by GDPR and Blockchain”, 6th International Conference on Advancements of Medicine and Health Care through Technology (MediTech), Cluj Napoca, ROMANIA, OCT 17-20, 2018, Book Series: IFMBE Proceedings, Volume: 71, Pages: 311-317, DOI: 10.1007/978-981-13-6207-1_49
3. Stefan, Iuliana; Enyedi, Szilard; Scurtu, Andrei; et al., Using the WaterML Standard Information Model, in a SCADA Federation Web Service CONTROL ENGINEERING AND APPLIED INFORMATICS Volume: 20 Issue: 1 Pages: 119-127 Published: MAR 2018
4. Bucur, V., Dehelean, C., Miclea, L., „Object storage in the cloud and multi-cloud: State of the art and the research challenges”, 2018 IEEE International Conference on Automation, Quality and Testing, Robotics, AQTR 2018 - THETA 21st Edition, Proceedings, pp. 1-6
5. Contan, Andrei; Dehelean, Catalin; Miclea, Liviu, Applying Coding Systems in the Process of Testing Software Applications 2017 14TH INTERNATIONAL CONFERENCE ON ENGINEERING OF MODERN ELECTRIC SYSTEMS (EMES) Pages: 127-131 Published: 2017
6. S. C. Folea, G. Mois, C. I. Muresan, L. Miclea, R. De Keyser, and M. N. Cirstea, "A Portable Implementation on Industrial Devices of a Predictive Controller Using Graphical Programming", *Ieee Transactions on Industrial Informatics*, vol. 12, pp. 736-744, Apr 2016.
7. T. Sanislav, G. Mois, and L. Miclea, "An approach to model dependability of cyber-physical systems", *Microprocessors and Microsystems*, vol. 41, pp. 67-76, Mar 2016.
8. T. Sanislav, G. Mois, L. Miclea, "An Approach to Model Dependability of Cyber-Physical Systems", *Microprocessors and Microsystems*, vol. 41, pp. 67-76, March 2016, ISSN: 0141-9331, DOI: 10.1016/j.micpro.2015.11.021
9. M. Neagu, L. Miclea, S. Manich, "Improving security in cache memory by power efficient scrambling technique", *IET Computers & Digital Techniques*, Vol. 9, Issue 6, 2015, pp. 283-292

Patents:

1. L. Miclea, D. Goța, H. Lund, D. Connolly, "Method for generation of the necessary energy distributions of hourly thermal plants based on the outside temperature", no. A/10019/2012 / July 17, 2012
2. J. Figueras, L. Miclea, G. Moiş, "Method for the dynamic voltage scaling in an arithmetic-logic unit based on on-line error detection", no. OSIM: A/10028/2011 / July 11, 2011
3. L. Miclea, D. Sauciuc, O. Stan, I. Păun, C. Dehelean, S. Enyedi, I. Ștefan, "National electronic healthcare record and its creation method", no. A/10033/2010 / November 26, 2010

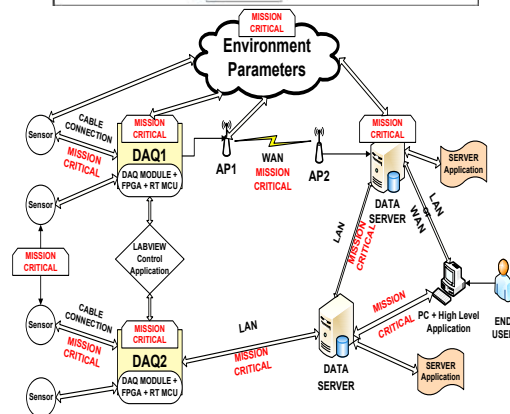
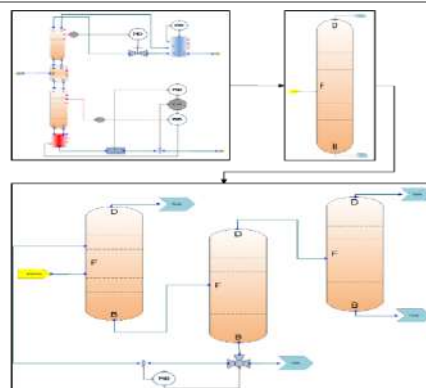
The offer addressed to the economic environment

Research & development	ABSTRACT ions definition, architectures design and tools implementation to achieve the development of highly dependable and secure CPSs; Expansion of artificial intelligence techniques in order to implement some modelling and control applications. Analysis, design, implementation and validation of dependable CPSs used in water resources management, electrical power generation and transport; Analysis, design, implementation and validation of information systems applied in various fields; Application of artificial intelligence techniques in energy production, medicine, food quality control.
Consulting	Consulting, research, design, development of dependable information systems and intelligent systems for industrial and scientific environment.
Applied engineering services	Computer testing services; Programming and software and hardware consultancy services; Intelligent systems design and implementation services.
Training	Dependable basics: availability, reliability, safety, integrity and maintainability; CPS basics: hardware and software architecture, physical devices development and programming, decision support, historical databases design and management, historical data pre- and post-processing; Software testing techniques: functional testing, structural testing, use of software testing frameworks; Artificial intelligence techniques: intelligent agents, multi-agent systems, data mining.

PROCESS AND ENERGY SYSTEMS ENGINEERING

Contact details

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Areas of expertise

Process modelling and simulation

- First principle modelling
- Gray box modelling with partial derivative equations

Process control

- Plantwide control
- Control strategies for unconventional processes (e.g. cryogenic separation units, heavy water production)
- Development of control algorithms for processes with distributed parameters
- System identification technologies
- Dedicated control solutions for: rotary hearth furnaces, blunting systems, rolling mills, piercers and storage tanks

Energy systems

- Renewable energy systems
- Nuclear power plants
- Laser, plasma and electron irradiation processes
- Steam power plants

Medical systems

- Respiratory system
- Dental systems

Team

Prof. Dr. Eng. Mihail Abrudean, Assoc. Prof. Dr. Eng. Vlad Mureșan, Assist. Prof. Dr. Eng. Ionuț Muntean, Assist. Prof. Dr. Eng. Iulia Clitan.

Representative projects

“Embedded mode for advanced pressure control in protected spaces”, PNIII-CI-2017

“Optimizing the length of steel bars according to the process of programming the production of tubular material and in relation to the production process in the steel works” internal project funded by TUCN (2016-2017)

“Stimulation of the return curve (metallographic process)”, internal project funded by TUCN (2016-2017)

I3E, “Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking”, South East Europe Transnational Cooperation Programme (SEE), (2010-2012)

“Advanced metallurgical process control for the production of seamless steel tubes”, BD-CNCSIS, (2008-2010)

Significant results

The most representative publications of the past 5 years:

1. Mureşan V, Abrudean M, „Conducerea proceselor industriale , Editura Galaxia Gutenberg, Cluj-Napoca 2017, 181 pagini, ISBN 978-973-141-699-1.
2. Vlad Mureşan, Mihail Abrudean, Mihaela-Ligia Ungureşan, Iulia Clitan, Tiberiu Coloşi, “Intelligent temperature control in an industrial furnace”, ICCAE conference, Sydney, Australia, 14-16 Februarue, 2020.
3. Vlad Mureşan, Iulia Clitan, Valentin Sita, Mihail Abrudean, Mihaela-Ligia Ungureşan, “¹⁸O Isotope Separation Process Control”, Lecture Notes in Electrical Engineering book series (LNEE, volume 613), 26 Octombrie 2019.
4. Vlad Mureşan, Mihail Abrudean, “Fault Tolerant Control System of the Rotary Hearth Furnace Servicing Machines”, 2019 IEEE 22nd International Symposium on Design and Diagnostics of Electronic Circuits & Systems (DDECS), 24-26 Aprilie 2019, Cluj-Napoca, România.
5. Vlad Mureşan, Mihail Abrudean, Iulia Clitan, Mihaela-Ligia Ungureşan, Roxana Carmen Cordoş, Călin Ciprian Oţel, “Advanced Control System for the Rotary Hearth Furnace Servicing System”, IEEE 13th International Symposium on Applied Computational Intelligence and Informatics (SACI 2019), 29-31 Mai, 2019, Timişoara, România.
6. Iulia Clitan, Vlad Mureşan, Mihail Abrudean, Zoltan Kovendi, Eugen Ioan Gergely, “Discrete Modeling and Control of an Industrial Robot used in a Metallurgical Process” 15th International Conference on Engineering of Modern Electric Systems (ICEMES 2019), 13-14 Iunie, 2019, Oradea, România.
7. Mihail Abrudean, Mihaela-Ligia Ungureşan, Helga Silaghi, Vlad Mureşan, Adrian Codoban, “Experimental Identification of the ¹³C Isotope Separation Process by Cryogenic Distillation on a Two Column Separation Cascade”, 15th Intern.I Conference on Engineering of Modern Electric Systems (ICEMES 2019), 13-14 2019, Oradea, România.
8. Vlad Mureşan, Daniel Moga, Dorin Petreuş, Mihail Abrudean, Nicoleta Stroia, Rozica Moga “Fault Tolerant Control System for Photovoltaic Panels Application”, 2019 IFAC Workshop on Control of Smart Grid and Renewable Energy Systems, 10-12 Iunie, 2019, Jeju, Coreea de Sud.
9. Iulia Clitan, Vlad Mureşan, Mihail Abrudean, Valentin Sita, “Discrete Model for the Movement of Industrial Manipulator Used in Hot Rolling Process”, The 14-th edition of the Simulation, Modeling and Optimization in the Fields of Aerospace, Robotics, Manufacturing Systems, Mechanical Engineering, Power Energy, Materials Technology and Neurorehabilitation - SLS&OPTIROB 2019, 27 iunie-1 Iulie 2019, Jupiter, Constanţa, România.
10. Iulia Clitan, Vlad Muresan, Mihail Abrudean, Andrei Florin Clitan, Honoriu Vălean, Mihaela Ligia Ungureşan, “Comparison of Continuous and Discrete PI Control on Clamp Positioning of an Industrial Robot”, 2019 23rd International Conference on System Theory, Control and Computing (ICSTCC), 9-11 Oct. 2019, Sinaia, România.
11. Muresan V.Coloşi, Abrudean M, Conducerea proceselor industriale –Indrumator de proiect. Editura Galaxia Gutemberg ISBN 978-973-141-759-2, 2018
12. Muresan, Vlad; Abrudean, Mihail; Unguresan, Mihaela-Ligia; et al., Control of the Isotopic Exchange for O-18 Isotope Production 2018 IEEE 12TH SACI Pages: 389-394 Published: 2018
13. Unguresan, Mihaela-Ligia; Muresan, Vlad; Gligor, Delia; et al., Adsorption process of phenothiazine solution in dimethyl sulfoxide on graphite electrodes Journal of Solid State Electrochemistry Vol: 22 Issue: 8 Pages: 2305-2314 Published: AUG 2018
14. Muresan, Vlad; Moga, Daniel; Petreus, Dorin; et al., Fault Detection and Fault Tolerance Mechanism for DC/DC Converters in Microgrids 10th IFAC Symposium on Control of Power and Energy Systems (CPES) Location: Meiji Univ, Nakano Campus, Tokyo, JAPAN Date: SEP 04-06, 2018 IFAC PAPERSONLINE Volume: 51 Issue: 28 Pages: 666-671 Published: 2018

Significant solutions

First principle modelling library for distillation processes with non-ideal mixtures, Tuning algorithm for P, ID controllers for discrete-time systems with dead time, Gray box modelling platform, Control strategies for isotopic processes, Plantwide control strategies for distillation processes, Tuning algorithms for coupled PID co, ntrollers for performance improvement

Products and technologies:

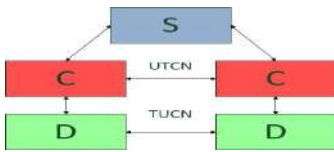
1. First principle modelling framework for distillation processes with non-ideal mixtures
2. General modelling and control framework using partial derivative equations
3. Robust PID tuning algorithm for discrete-time systems

The offer addressed to the economic environment

Research & development	Development of open- and closed-loop identification solutions. Development of tailored solutions for the modelling, simulation and control of chemical and energy systems. Development of general first principle modelling libraries/frameworks for chemical and energy systems. Development of general control strategies for the chemical and energy sector. Development of optimal control strategies for renewable energy systems. Development of models for biomedical applications.
Consulting	System identification. Process modelling. Tuning of coupled controllers. Calculation of the economic potential of implementing advanced control strategies. Support for the implementation of our proposed technical solutions.
Training	Systems theory: identification methods, stability analysis, control loops, controllers. Process control: optimal control algorithms, plantwide control, PID tuning (discrete and continuous systems), control of unconventional processes. Electronics: power and basic electronics.

DISTRIBUTED CONTROL SYSTEMS

Contact details

Name	Distributed Control Systems
Acronym	DCS
Logo	
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/4_Letia.pdf
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Telephone	+40 264 401432
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Director	Prof. Dr. Eng. Tiberiu Leția
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Areas of expertise

Distributed control systems, embedded systems, real-time application, intelligent control etc.

Team

Prof. Dr. Eng. Tiberiu S. Letia, Prof. Dr. Eng. Adina Aștilean, Assist. Prof. Dr. Eng. Camelia Avram, Assist. Prof. Dr. Eng. Mihai Hulea, Assist. Prof. Dr. Eng. Radu Miron, Assist. Dr. Eng. Dan Radu, Assist. Dr. Eng. Maria-Magdalena Santa, Assist. Dr. ing. Octavian Cuibus

Representative projects

“Intelligent control system of road traffic”, research topic in the Postdoctoral project: Development and support of multidisciplinary postdoctoral programs in major technical areas of national strategy of Research - Development - Innovation” 4D-POSTDOC, contract no. POSDRU/89/1.5/S/52603, project co-funded by the European Social Fund through Sectorial Operational Program Human Resources Development 2007-2013, (2010-2013).

I3E, “Promoting Innovation in the Industrial Informatics and Embedded Systems Sectors through Networking”, Contract EU: SEE/A/219/1.1/X, <http://www.i3e.eu/> (2009-2012)

“Identification system based on digital fingerprint with mobile terminals”, PNII-PDP (Joint Applied Research Project) 11038/2007, (2007-2010)

“Real-Time intelligent system for management, control and information of railway traffic”, Grant Cod CNCSIS: 1537/2007, (2007-2009)

Significant results

The most representative publications of the past 5 years:

1. D. Al-Janabi, T.S. Letia. Analysis of Applications Conceived by Object Enhanced Time Petri Nets. IEEE Conf. ICSTCC, Sinaia, 2019
2. M. F. Enache, T.S. Letia. Approaching the Railway Traffic Resilience with Object Enhanced Time Petri Nets, . IEEE Conf. ICSTCC, Sinaia, 2019
3. Kilyen, Attila O.; Letia, Tiberiu S., Interactive development of cyber physical systems using UETPN model, Federated Conference on Computer Science and Information Systems (FedCSIS) Location: Poznan, POLAND Date: SEP 09-12, 2018, Book Series: Federated Conference on Computer Science and Information Systems Pages: 1035-1042 Published: 2018
4. Enache, Mihai F.; Al-Janabi, Dahlia; Letia, Tiberiu S., Railway Modeling with Object Enhanced Time Petri Nets

- Conference: 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA)
Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018
5. Letia, T. S.; Kilyen, A. O., Using Unified Enhanced Time Petri Net Models for Cyber-Physical System Development Conference: 9th Vienna International Conference on Mathematical Modelling (MATHMOD) Location: Vienna, AUSTRIA IFAC PAPERSONLINE Volume: 51 Issue: 2 Pages: 248-253 Published: 2018
 6. Radu, Dan; Cretu, Adrian; Parrein, Benoit; Avram Camelia, Astilean Adina et al., Flying Ad Hoc Network for Emergency Applications Connected to a Fog System ADVANCES IN INTERNET, DATA & WEB TECHNOLOGIES Book Series: Lecture Notes on Data Engineering and Communications Technologies Volume: 17 Pages: 675-686 Published: 2018
 7. Avram, Camelia; Miron, Radu; Radu, Dan; et al., Two-phase authentication and encryption algorithm for mobile users 2018 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR) Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
 8. Radu, Dan; Cretu, Adrian; Avram, Camelia; et al., Video Content Transmission in a Public Safety System Model based on Flying Ad-Hoc Networks 2018 IEEE INTERNATIONAL CONFERENCE ON AUTOMATION, QUALITY AND TESTING, ROBOTICS (AQTR) Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
 9. Avram, Camelia; Astilean, Adina; Valente, Eduardo, Timed Cellular Automata-Based Tool for the Analysis of Urban Road Traffic Models MECHATRONICS FOR CULTURAL HERITAGE AND CIVIL ENGINEERING Book Series: Intelligent Systems Control and Automation Science and Engineering Volume: 92 Pages: 35-61 Published: 2018
 10. Silva, Jose Reinaldo; Silva, Javier Martinez; Pereira, Celina; Avram Camelia et al., New Trends in Residential Automation MECHATRONICS FOR CULTURAL HERITAGE AND CIVIL ENGINEERING Book Series: Intelligent Systems Control and Automation Science and Engineering Volume: 92 Pages: 137-157 Published: 2018
 11. Florian, Horatiu; Mocanu, Adrian; Vlasin, Cristian; Camelia Avram, Adina Astilean et al., Deaf people feeling music rhythm by using a sensing and actuating device SENSORS AND ACTUATORS A-PHYSICAL Volume: 267 Pages: 431-442 Published: NOV 1 2017
 12. Letia, Tiberiu S.; Kilyen, Attila O., Unified Enhanced Time Petri Net Models for Development of the Reactive Applications Conference: 3rd International Conference on Event-Based Control, Communication and Signal Processing (EBCCSP) Location: Funchal, PORTUGAL Date: MAY 24-26, 2017

Significant solutions:

Control and monitoring system for urban vehicle traffic
Control and monitoring system for railway traffic
Control systems for Flexible Manufacturing Systems
Distributed control for hybrid processes.
Design, verification and implementation real-time (embedded) applications.
Person identification based on digital fingerprint.

The offer addressed to the economic environment

Research & development	Automatic synthesis of control and monitoring systems for discrete event or hybrid, concentrated or distributed processes. Verification of real-time applications.
Consulting	Embedded systems, real-time application design, implementation and verification. Distributed control systems for urban vehicle traffic or railway traffic.
Training	Design and implementation of real-time application, Design and implementation of distribute control application Distributed control of Transportation systems.

RAPID PROTOTYPING DESIGN IN CONTROL SYSTEMS

Contact details

Name	Rapid Prototyping Design in Control Systems
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Telephone	Automation Department
Fax	+40 264 401433
Director	Prof. Dr. Eng. Petru Dobra
e-mail	Petru.Dobra@aut.utcluj.ro



Areas of expertise

Digital Control of electrical drives for CNC machines.
Electrical drives for industrial robots.
Equipment Setup for building automation;
Embedded systems for intelligent environment.

Team

Prof. Dr. Eng. Petru Dobra, Assist. Drd. Eng. Mircea Șușcă, Assist. Drd. Eng. Dora Laura Morar, Assist. Prof. Dr. Eng. Mirela Dobra, Drd. Eng. Vlad Mihaly, Dr. Eng. Marius Costandin, Dr. Eng. Vasile Boancă

Representative projects

"The platform embedded for controlling a solar thermal cooling system suitable for small / medium scale cooling applications", 2014-2015, internal research project financed by TUCN
VISICOM, "Vision Bases Systems for Intelligent Control and Monitoring", CEEX NR.X2C21/18.07.2006
"Research on sensors technology and design algorithms for signal processing", Research Contract nr.22520/30.11.2005 UTC-N – MultiPRO Amsterdam, (2005-2006)
RADEPA, "Rapid development of prototyping for actuators systems", CNCSIS 1257/2005
"PLC equipment for fault detection and isolation in electrical drives and sensors systems", Research Grant CNCSIS tip E, nr. 108/2004
"H[∞] techniques for fault detection and isolation in electrical drives and sensors systems", research grant CNCSIS AT 230/2001 & 48/2003

Significant results

The most representative publications of the past 5 years:

1. Costandin, Marius, and Petru Dobra. "Polynomial trajectory generation and tracking for linear systems." International Journal of Control (2019): 1-10.
2. Mihaly, Vlad, Mircea Susca, and Petru Dobra. "Passivity-Based Controller for Nonideal DC-to-DC Boost Converter." 2019 22nd International Conference on Control Systems and Computer Science (CSCS). IEEE, 2019.
3. Fratean, Adrian; Dobra, Petru, Control strategies for decreasing energy costs and increasing self-consumption in nearly zero-energy buildings SUSTAINABLE CITIES AND SOCIETY Volume: 39 Pages: 459-475 Published: MAY 2018
4. Costandin, Marius; Costandin, Benjamin; Dobra, Petru, Nonlinear Model and Trajectory Control of A Novel VTOL Vehicle II Conference: INTERNATIONAL CONFERENCE ON UNMANNED AIRCRAFT SYSTEMS (ICUAS) Location: Dallas, TX Date: JUN 12-15, 2018 Book Series: International Conference on Unmanned Aircraft Systems Pages: 806-815 Published: 2018

5. Costandin, Marius; Dobra, Petru, Derivation of Nonlinear Mathematical Model of Two-Wheeled Inverted Pendulum 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 94-99 Published: 2017
6. Rusu, Andrei; Dobra, Petru, The implementation of an ARM-based low-power wireless process control system 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 666-670 Published: 2017
7. Fratean, Adrian; Dobra, Petru; Carutasu, Mihail-Bogdan, Dynamic temperature setpoint control as a strategy for reducing costs and energy consumption in nearly zero-energy buildings 2017 21ST INTERNATIONAL CONFERENCE ON SYSTEM THEORY, CONTROL AND COMPUTING (ICSTCC) Book Series: International Conference on System Theory Control and Computing Pages: 677-682 Published: 2017
8. Sita Ioan-Valentin, Dobra Petru, Moga Daniel, et al., "Optimization of Residential Heating Systems Using Accumulators", IEEE 15th International Conference on Environment and Electrical Engineering (EEEIC), Rome, ITALY, JUN 10-13, 2015, Pp. 2165-2170, Published: 2015
9. D. Moga, I. Sita, N. Stroia, P. Dobra, R. Moga, D. Petreus, "Sensing and Control Strategies in Tracking Solar Systems", 20th International Conference on System Controls and Computer Science 2015, Bucharest, ROMANIA, Vol.2, pag. 989-995, 2015.

Significant solutions:

Golden Medal, Innova, Bruxelles, 2011, "Automatic system for the analysis of electrical energy quality", Radu Munteanu, Petru Dobra, Daniel Moga, Radu Adrian, Munteanu, Mihai Stelian Munteanu, Mirela Trușcă, Dorin Petreus, Valentin Sita

The offer addressed to the economic environment

Research & development	Digital control system development for electrical drives with BLDC and PMSM motors - implementation of EPLAN and Autocad Electrical projects; - ladder and C++ programming; - implementation of SCADA graphical interfaces; - control algorithms in Matlab, Labview; Upgrade, replacement or retrofitting electrical drives for - medium CNC machines - industrial robots with DC / Stepper / BLDC/ PMSM motors - configuring PLC's (Siemens, Omron). Equipment Setup for building automation; - PLC based automation systems; - energy resources management; - using KNX and LOGO! Controllers.
Consulting	Microcontrollers/PLC/ FPGA programing environments, data acquisition procedures Programming in C, C++, PHP, Java, Matlab; Home Automation Configuring (KNX and LOGO! Controllers)
Training	Implementing Embedded Control Systems for: - electrical drives (DC motors, BLDC motors, PMSM motors) - inteligente sensors systems (temperature, humidity, pressure) - home automation (KNX and LOGO! Controllers)

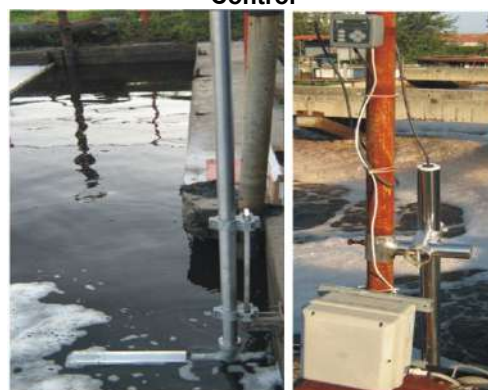
INDUSTRIAL PROCESSES CONTROL SYSTEMS AND INSTRUMENTATION

Contact details

Name	Industrial Processes Control Systems and Instrumentation
Acronym	IPCSI
Logo	
Site	https://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/IPCSI_Nascu.pdf
Address	2 Observatorului Street, lab. 301, Cluj-Napoca, Romania
Faculty Department	Faculty of Automation and Computer Science Automation Department
Telephone	+40-264-401 819
Fax	+40-264-401 220
Director	Prof. Dr. Eng. Ioan Nascu
e-mail	ioan.nascu@aut.utcluj.ro



Wastewater Treatment Plant Monitoring and Control



Control of the dissolved oxygen concentration in a wastewater treatment plant

Areas of expertise

Industrial processes control systems.

Performance evaluation of industrial processes, design, implementation and analysis of automatic systems for the control of process parameters.

Advanced automatic control strategies: advanced control structures, advanced control algorithms.

Embeddedsystems-microcontrollers, data acquisition interfaces, industrial communications.

Team

Prof. Dr. Eng. Ioan Nascu

Assist. Prof.Dr. Eng. Ruben Crisan, Assist. Dr. Eng. Tudor Buzdugan, Assist. Dr. Eng. Gabriel Harja

PhD students:, Assist. Drd. Eng.Isabela Birs, Assist. Drd. Eng. Mihai Stanese, Drd. Eng.Raul Prodan

Representative projects

SOMCEB - Development and validation of a multi-variable control system for the biological stage of wastewater treatment plants, PN-III-P2-2.1-CI-2018-1212, <https://somceb.wixsite.com/proiect>

SMEOPA -System for monitoring the efficiency and optimizing the aeration process for activated sludge wastewater treatment plants, PN-III-P2-2.1-CI-2017-0202, <https://smeopa2.wixsite.com/proiect>

CASEAU - "Strategii de conducere bazate pe tehnici de control avansat pentru optimizarea performantelor statiilor de epurare a apelor uzate si reducerea consumurilor energetice", PCCA 2013, Contract no. 274/2014, Caseau.wix.com/proiect

MULTIBAR, "Automatic modules for drinkable water using advanced oxidation processes and biofilter (multiple barriers)", PNII Innovation, 12DPST/20.08.2013, http://www.icpebn.ro/site_ro/cercetare/multibar/index.html (2013-2016)

TEHNOPUR, "Obtaining ultrapure water plant from primary sources", 2008-2010, INNOVATION Contract no. 177/2008, http://www.icpebn.ro/site_ro/cercetare/tehnopur/index.html (2008-2010)

Significant results

The most representative publications of the past 5 years:

1. Isabela Birs, Cristina Muresan, Dana Copot, Ioan Nascu, Clara Ionescu, Identification For Control Of Suspended Objects In Non-Newtonian Fluids, Fractional Calculus and Applied Analysis, Volume 22, Number 5 (2020), ISSN(Print) 1311-0454, (Electronic)ISSN 1314-2224,
2. Isabela Roxana Birs, Cristina Muresan, Ioan Nascu, Clara Ionescu, A Survey of Recent Advances in Fractional Order Control for Time Delay Systems, IEEE Access PP(99):1-1, March 2019, DOI: 10.1109/ACCESS.2019.2902567
3. Ioan Naşcu, Hierarchical predictive control of Wastewater Treatment Plants, MATEC Web of Conferences, Vol 210, art.no.02002 (2018)
4. Crisan, Ruben; Harja, Gabriel; Nascu, Ioan; et al., Hierarchical Control System for Energy Savings in Wastewater Treatment Plant, 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018 Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
5. Dragan, Paul; Stanese, Mihai; Nascu, Ioan, Camera-based liquid level measurement using the refractive properties of the medium, 21st IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR THETA) Location: Cluj Napoca, ROMANIA Date: MAY 24-26, 2018 Book Series: IEEE International Conference on Automation Quality and Testing Robotics Published: 2018
6. Muresan, Cristina I.; Nascu, Ioan; Dulf, Eva H., Design and Dynamics Analysis of a Fractional Order IMC Controller for a Waste Water Treatment Plant PROCEEDINGS OF THE 2017 12TH IEEE CONFERENCE ON INDUSTRIAL ELECTRONICS AND APPLICATIONS (ICIEA) Book Series: IEEE Conference on Industrial Electronics and Applications Pages: 693-698 Published: 2017
7. G. Harja, I. Nascu, C. Muresan, and I. Nascu, "Improvements in Dissolved Oxygen Control of an Activated Sludge Wastewater Treatment Process", *Circuits Systems and Signal Processing*, vol. 35, pp. 2259-2281, Jun 2016.
8. I. Nascu, G. Harja, "MPC advanced control of dissolved oxygen in an activated sludge wastewater treatment plant", *2016 IEEE International Conference on Automation, Quality and Testing, Robotics (AQTR)*, Vol.1, pp. 269-274, 2016.
9. I. Nascu, N. Ioana, "Modelling and optimization of an activated sludge wastewater treatment process", *Computer Aided Chemical Engineering*, Vol.38, pp.1159-1164, 2016.
10. Crisan R., Nascu I., De Keyser R., Volcke E., "EPSAC for wastewater treatment process", (BSM1). *17th International Conference on System Theory, Control and Computing (ICSTCC)*, 14-19.Oct. 2015, Cheile Gradistei, Pages: 403 - 408, DOI: 10.1109/ICSTCC.2015.7321327, IEEE Catalog Number: CFP1536P-ART.

Patents:

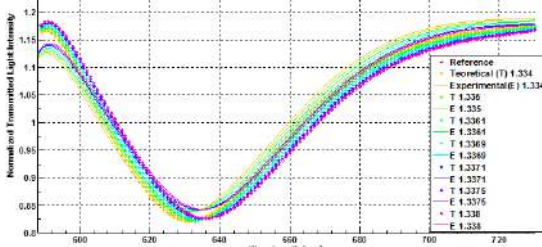
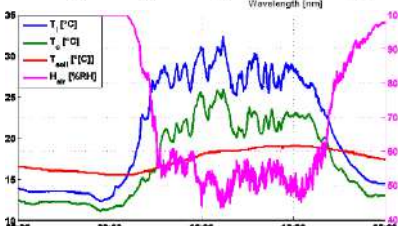
"Parameters scheduling method for PID controllers", no. VI/112, September, 30, 2013

The offer addressed to the economic environment

Research & development	Modeling and simulation of processes with applications especially in chemical and biochemical processes. Advanced control strategies in biochemical processes. Advanced control strategies with applications in medicine.
Consulting	Evaluation and optimization of automatic control systems. Implementation of control systems using advanced control strategies
Training	Industrial process control systems. Complex industrial processes modeling and simulation. Sensors and instrumentation. PLC configuration and programming. Advanced control algorithms (model based predictive control, adaptive control).

ADVANCED SENSING TECHNOLOGIES GROUP

Contact details

Name	Advanced Sensing Technologies Group	    
Acronym	GAST	
Logo		
Site	www.gast.utcluj.ro	
Address	2, Observatorului Street, 5 th Floor, Room 505, Cluj-Napoca, Romania	
Faculty Department	Faculty of Automation and Computer Science Automation Department	
Telephone	+40 726 362 327	
Director	Prof. Dr. Eng. Daniel Moga	
e-mail	Daniel.Moga@aut.utcluj.ro	

Areas of expertise

Smart sensors

-Simulation and design of optical sensors, MEMS based sensors, capacitive sensors, weather instruments

Wired and wireless sensor networks

-Ultra low power wireless sensors; Environmental monitoring with sensor networks; Multipoint wired networks

Hardware/software codesign for distributed control on embedded platforms

-Smart actuators; Fault tolerant control networks; Embedded servers and HMIs

Embedded hardware design for medical devices

- Innovative immunosensors; Monitoring in post-traumatic rehabilitation; Hyperthermic chemotherapy systems; Magnetic therapy equipment

Vision based monitoring and control

-Vision based automation systems for: quality control, automation in food industry, monitoring in agriculture

Team

Prof. Dr. Eng. Daniel Moga, Prof. Dr. Eng. Dorin Petreus, Prof. Dr. Mat. Mircea Ivan, Prof. Dr. Mat. Ion Gavrea, Prof. Dr. Ion Aurel Mironiuc, Dr. Corneliu Lungoci, Dr. Traian Oniu, Assoc. Prof. Dr. Eng. Mihai Stelian Munteanu, Assoc. Prof. Dr. Eng. Ramona Galatus, Assoc. Prof. Dr. Eng. Vlad Muresan, Assoc. Prof. Dr. Mat. Bogdan Gavrea, Assoc. Prof. Dr. Eng. Eugen Vitan, Dr. Mat. Rozica Moga, Dr. Eng. Iulia Clitan, Dr. Eng. Nicoleta Stroia, Phd. Student Eng. Zsolt Barabas

Representative projects

"Hyperthermic Intra-Peritoneal Chemotherapy Equipment based on Cyber-Physical System Paradigm"

Project no. PN-II-RU-TE-357/01.10.2015, funded by the Romanian Ministry of Education and Research, UEFISCDI, (2015-2017), <http://hiper-cps.hpm.ro/>

HydroSens – "Integrated Smart Sensor System for Monitoring of Strategic Hydrotechnical Structures", PN-II-PT-PCCA-2011-nr.71, <http://hydrosens.hpm.ro> (2012-2016)

Algorithms and methods for optical signal processing (2011-2014)

Medical equipment for magnetic therapy with low frequency pulsed magnetic field - ATM41, PN2, 2012

Complex architecture for monitoring and transfer of medical data. CNCSIS 1019, (2008-2010)

Research on Test Compression and LBIST, Research contract UTCN-Philips Semiconductors, (2005-2008)

Vision based systems for monitoring and intelligent control, X2C21/ 18.07.06, (2006-2008)

Significant results

The most representative publications of the past 5 years:

1. Muresan, Vlad; Moga, Daniel; Petreus, Dorin; et al., Fault Detection and Fault Tolerance Mechanism for DC/DC Converters in Microgrids 10th IFAC Symposium on Control of Power and Energy Systems (CPES) Location: Meiji Univ, Nakano Campus, Tokyo, JAPAN Date: SEP 04-06, 2018 IFAC PAPERSONLINE Volume: 51 Issue: 28 Pages: 666-671 Published: 2018
2. Rusu, Cristian-Bogdan; Lungoci, Corneliu; Moga, Daniel; et al., Modelling a Temperature Calibration System for Medical Probes 21st International Conference on Control Systems and Computer Science (CSCS) Location: Univ Politehnica Bucharest, Bucharest, ROMANIA Date: MAY 29-31, 2017 Pages: 26-33 Published: 2017
3. D. Moga, D. Petreus, N. Stroia, „Web based solution for remote monitoring of an islanded microgrid”, *The 42nd Annual Conference of IEEE Industrial Electronics Society (IEEE IECON 2016)*, Florence, Italy, pp. 125-130, 2016.
4. Moga, Daniel; Petreus, Dorin; Muresan, Vlad; et al., Optimal generation scheduling in islanded microgrids IFAC Workshop on Control of Transmission and Distribution Smart Grids (CTDSG) Location: Prague, CZECH REPUBLIC Date: OCT 11-13, 2016 Volume: 49 Issue: 27 Pages: 135-139 Published: 2016
5. Moga, Daniel; Petreus, Dorin; Stroia, Nicoleta, Web based solution for remote monitoring of an islanded microgrid PROCEEDINGS OF THE IECON 2016 - 42ND ANNUAL CONFERENCE OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY Book Series: IEEE Industrial Electronics Society Pages: 4258-4262 Published: 2016
6. C. Lungoci, D. Moga, V. Muresan, D. Petreus, N. Stroia, R. Moga, M. Munteanu, I. Raus, V. Muntean, A. I. Mironiuc. "Hyperthermic Intraperitoneal Chemotherapy Approach Based on Cyber-Physical System Paradigm", *Journal of Control Engineering and Applied Informatics*, vol 17, no 3, pp. 50-59, 2015.
7. R. Etz, D. Petreus, T. Frentiu, T. Patarau, C. Orian, "An Indirect Method and Equipment for Temperature Monitoring and Control", *Advances in Electrical and Computer Engineering*, vol.15, no.4, pp.87-94, 2015, doi:10.4316/AECE.2015.04012
8. Juan A. Vallés and R. Gălătuș, "Requirements for gain/oscillation in Yb3+/Er3+-codoped microring resonators", *Proc. SPIE 9359, Optical Components and Materials XII*, 93591R (March 16, 2015); doi:10.1117/12.2078657; <http://dx.doi.org/10.1117/12.2078657>
9. C. Cristea, A. Florea, R. Galatus, E. Bodoki, R. Sandulescu, D. Moga, and D. Petreus, "Innovative immunosensors for early stage cancer diagnosis and therapy monitoring", in *The International Conference on Health Informatics (Y.-T. Zhang, ed.)*, vol. 42 of IFMBE Proceedings, pp. 47-50, 2014, *Springer International Publishing*.

Significant solutions:

Low cost hardware platforms for distributed sensing; Web based monitoring software for ARM platforms; Cross platform SCADA libraries; Ultra low power 8 bit embedded platform for wireless applications; Distributed control platform for building automation; Vision based mass and volume estimation for real time measurement of moving objects; CT medical image processing for computer assisted surgery

Products and technologies:

1. Distributed sensing and control platform (embedded and PC) with applications deployed in: industrial systems health monitoring, greenhouse automation, building automation
2. Smart communications hub for sensor networks, allowing data logging, processing, bridging, storing and streaming and html browser-based visualization for multiple wired/wireless sensing devices
4. Soil humidity sensors with wired/wireless interfaces
5. Weather sensors with Modbus interface
6. Condition monitoring systems for industrial machines and equipment
7. Internet based embedded platform for condition-based maintenance support
8. Vision-based equipment for high speed sorting in food industry
9. Integrated equipment for remote control and monitoring of greenhouse fields
10. Wireless system for monitoring and control of the progressive loading of lower limb in post-traumatic rehabilitation

Patents:

1. OSIM 123261 - **System for Monitoring the Progressive Loading of Lower Limb in Post-Traumatic Rehabilitation**, 2011
2. OSIM 122976 - **System and Process for Indirectly Measuring Mass of Objects in Motion**, 2010
3. OSIM 122986 - **Contactless Coupling Circuit**, 2010
4. OSIM 122380- **Method and Device for Measuring Rotational Speed in Highly Disturbing Media**, 2009
5. OSIM 123490 - **Wireless System for Remote Tilt Measurement**, 2012

The offer addressed to companies

Research & development	Development of analytical and numerical models for sensor devices. Identification and calibration of measurement system models. Development of algorithms for sensor fault identification and isolation in control networks. Optimization of advanced digital signal processing algorithms for embedded platforms. Development of real-time measurement systems for vision based inspection and sorting. Development of real-time medical signal processing libraries.
Consulting	Consulting, design, research and prototyping in advanced sensing systems for remote monitoring Custom integrated hardware and software solutions for specific distributed control application Simulation and design of smart sensor for medical applications

WIRELESS SENSOR APPLICATIONS

Contact details

Name	Wireless Sensor Applications
Acronym	WS-App
Logo	
Site	http://users.utcluj.ro/~sfolea/ https://erris.gov.ro/Embedded-Systems-and-Wireles https://scholar.google.ro/citations?user=nQaILkAAA&AJ&hl=ro
Address	Observator St., No. 2, 3 rd Floor, Room 301, 400489
Faculty Department	Faculty of Automation and Computer Science Department of Automation
Telephone	+40 264 401819
Fax	+40 264 599893
Director	Prof. Dr. Eng. Silviu Folea
e-mail	silviu.folea@aut.utcluj.ro



Areas of expertise

Embedded system design

- The design and development of embedded systems based on microcontrollers, having sensor measuring and transmission capabilities: Wi-Fi, BLE or LoRa; Power harvesting.

Advanced process control

- The development of advanced control systems on industrial real-time platforms which include FPGA chips; LabVIEW™ graphical programming.

Team

Prof. Dr. Eng. Silviu Folea; Assist. Prof. Dr. Eng. George Mois; Assist. Prof. Dr. Eng. Mihai Hulea; PhD Student Eng. Ionuț Dobra.

Representative projects

“Thermal printer, bluetooth low energy and microSD data logger”, Contract no. 65CI/2017, PN III (2017).

“Evaluation of Power Harvesting Elements in Wireless Sensors”, Contract no. 1998/12.07.2017, TUCN internal grant.

“Sub 1 GHz ISA100 technology for low cost and low power consumption embedded systems”, TETRACOM – 3rd Call for TTP Proposals (FP7), Partial Funding for Academia-Industry Technology Transfer Projects in Computing Systems, Technology Transfer in Computing Systems, no. 609491/2016.

“Power Harvesting Ambient Beacon for the IoT”, Accenture Industrial Software Solutions (AISS), Grant - Industrial Internet of Things (IIoT), no. 8678/2016.

“WAIST: Wireless Applications for Satellite Assembly Integration and Testing Applications”, nr. 4000108133, Control Data Systems SRL (CDS) and Thales Alenia Space France (TAS-F), contract with European Space Agency (ESA) no. AO7169, (2015-2016).

Significant results

The most representative publications of the past 5 years:

1. S.C. Folea, G.D. Mois, "Lessons Learned from the Development of Wireless Environmental Sensors," in *IEEE Transactions on Instrumentation and Measurement*, vol. , pp. 1-1, DOI: 10.1109/TIM.2019.2938137, 28 Aug 2019.
2. T. Sanislav, S. Zeadally, G.D. Mois, S.C. Folea, "Wireless energy harvesting: Empirical results and practical considerations for Internet of Things," in *Journal of Network and Computer Applications*, vol. 121, pp. 149-158, ISSN 1084-8045, <https://doi.org/10.1016/j.jnca.2018.08.002>, 2018.
3. C.I. Muresan, I.R. Birs, S. Folea and C. Ionescu, "Fractional order based velocity control system for a nanorobot in non-Newtonian fluids", *Bulletin of the Polish Academy of Sciences Technical Sciences*, Vol. 66, No. 6, 2018 DOI: 10.24425/bpas.2018.125946.

4. Muresan, C. I., Ionescu, C. M., Dulf, E. H., Rusu-Both, R. and Folea, S., "Advantage of Low Cost Predictive Control: Study Case on a Train of Distillation Columns," *Chemical Engineering & Technology*, 41: 1936-1948, 2018, doi:10.1002/ceat.201700529.
5. G.D. Mois, T. Sanislav, S.C. Folea, S. Zeadally, "Performance Evaluation of Energy-Autonomous Sensors Using Power-Harvesting Beacons for Environmental Monitoring in Internet of Things (IoT)," *Sensors*, Vol. 18, Issue: 6, Article Number: 1709, doi:10.3390/s18061709, http://www.mdpi.com/1424-8220/18/6/1709.
6. C.I. Muresan, S. Folea, I.R. Birs, C. Ionescu, "A novel fractional-order model and controller for vibration suppression in flexible smart beam," *Nonlinear Dynamics*, 93:525–541, 9 March 2018.
7. S. Folea, R. De Keyser, I.R. Birs, C.I. Muresan, C.I. Ionescu, "Discrete-Time Implementation and Experimental Validation of a Fractional Order PD Controller for Vibration Suppression in Airplane Wings," *Acta Polytechnica Hungarica*, vol. 14, no. 1, pp. 191-206, 2017.
8. G. Mois, S. C. Folea and T. Sanislav, "Analysis of Three IoT-Based Wireless Sensors for Environmental Monitoring," in *IEEE Transactions on Instrumentation and Measurement*, vol. 66, Issue: 8, Pages: 2056-2064, Aug 2017.
9. G. Mois, T. Sanislav and S. C. Folea, "A Cyber-Physical System for Environmental Monitoring," in *IEEE Transactions on Instrumentation and Measurement*, vol. 65, no. 6, pp. 1463-1471, June 2016.
10. S. Folea, G. Mois, C. I. Muresan, L. Miclea, R. De Keyser and M. N. Cirstea, "A Portable Implementation on Industrial Devices of a Predictive Controller Using Graphical Programming," in *IEEE Transactions on Industrial Informatics*, vol. 12, no. 2, pp. 736-744, April 2016.
11. S. Folea, C. I. Muresan, R. De Keyser and C. M. Ionescu, "Theoretical Analysis and Experimental Validation of a Simplified Fractional Order Controller for a Magnetic Levitation System," in *IEEE Transactions on Control Systems Technology*, vol. 24, no. 2, pp. 756-763, March 2016.
12. C. I. Muresan, C. Ionescu, S. Folea, R. DeKeyser, "Fractional Order Control of Unstable Processes: The Magnetic Levitation Study Case," *Nonlinear Dynamics*, special issue entitled "Fractional Dynamics and Its Applications", June 2015, Volume 80, Issue 4, pp 1761–1772, ISSN: 0924-090X.
13. Folea, S.C.; Mois, G., "A Low-Power Wireless Sensor for Online Ambient Monitoring," *IEEE Sensors Journal*, vol.15, no.2, pp.742,749, Feb. 2015, doi: 10.1109/JSEN.2014.2351420.
1. C.I. Muresan, R. De Keyser, I.R. Birs, S. Folea, O. Prodan (2019), "An Autotuning Method for a Fractional Order PD Controller for Vibration Suppression" In: Taş K., Baleanu D., Machado J. (eds) *Mathematical Methods in Engineering. Nonlinear Systems and Complexity*, vol 24. Springer, Cham, The Institution of Engineering and Technology.
2. T. Sanislav, G. Mois, S. Folea, L. Miclea (2015), "Integrating Wireless Sensor Networks and Cyber Physical Systems: Challenges and Opportunities", Book title "Cyber-Physical System Design with Sensor Networking Technologies", Sherali Zeadally, Nafaa Jabeur, publisher The Institution of Engineering and Technology, ISBN: 978-1849198240.

Significant solutions:

Wireless sensors based on Wi-Fi Low Power, BLE (Bluetooth Low Energy) or LoRA.

Development and implementation of advanced control methods on dedicated industrial systems.

Products and technologies:

Electronic equipment design, dedicated solutions. Hardware and software implementation.

Patents:

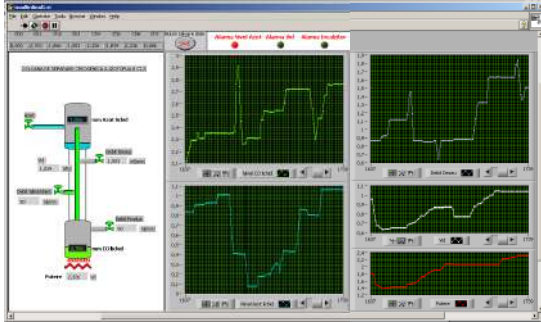
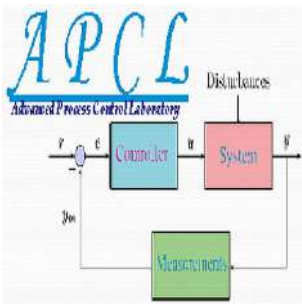
1. A. Aştilean, T. Leţia, S. Folea, C. Avram, M. Hulea, R. Miron, E. Ciupan, „Secured System and Method of Communication Between Fixed and Mobile Devices”, Brevet RO 127706 A2, nr. UTC-N 1000003415.
2. M. Ghercioiu, H. Hedesiu, S. Folea, G. Crisan, C. Ceteras, I. Monoses, "Compact modular embedded device", United States Patent 7860582B2, 12/28/2010
3. M. Ghercioiu, H. Hedesiu, S. Folea, G. Crisan, C. Ceteras, I. Monoses, "Deployment and execution of a graphical program on an embedded device from a PDA", United States Patent 7647562B2, 01/12/2010

The offer addressed to the economic environment

Research & development	The development of hardware equipment and of software products for new structures of data acquisition and communication. The design of dedicated measurement and wireless communication equipment and of location tracking equipment in open air using GPS or in industrial halls and office buildings using other technologies. The development, the simulation and the testing of advanced control methods, their implementation on industrial control systems.
Consulting	Consulting activities for the development of distributed monitoring and control applications utilizing wireless communication.
Training	LabVIEW™ courses and introduction to digital design using LabVIEW™ and VHDL; Electronic equipment design; Firmware development; Advanced control of industrial processes.

ADVANCED PROCESS CONTROL METHODS

Contact details

Name	Advanced Process Control Methods	
Acronym	MACP	
Logo		
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Systems%20Engineering/8_Dulf.pdf	
Address	2 Observatorului Str., 400489, Cluj-Napoca, Romania	
Faculty Department	Faculty of Automation and Computer Science, Automation Department	
Telephone	+40 264 401821	
Fax	+40 264 401220	
Director	Prof. Dr. Eng. Eva H. Dulf	
e-mail	Eva.Dulf@aut.utcluj.ro	

Areas of expertise

Complex process modelling and simulation

- Detailed models and simulations of various industrial applications

Tuning, design and testing of various control solutions including advanced control algorithms such as predictive, fractional or robust control

- Conceptual design of various control loops from classical PID to advanced control algorithms
- Control strategy implementation
- Control optimization

Particular advanced monitoring, supervising and control methods for non-conventional processes and technologies

- Conceiving of new, efficient technologies in isotopic and molecular processes
- Modelling, monitoring and control of biochemical and biomedical processes
- Improved efficiency based on optimization; process maintenance

Team

Prof. Dr. Eng. Eva H. Dulf, Prof. Dr. Eng. Clement Festila, Assoc. Prof. Dr. Eng. Cristina I. Muresan, Assoc. Prof. Dr. Eng. Roxana Both, Eng. Marius Ticala, PhD, Eng. Eng. Toader Seretan, Eng. Ronny Varvara, Eng. Alex Danku, Eng. Karoly Lengyel
PhD students: Eng. Lorand Szekely, Eng. Daniel D. Timis, Eng. Ciprian Vogt, Eng. Sergiu Chetan

Representative projects

SWEETCONOMY - Functional collaboration model between public research organizations and the economic environment for the provision of high-level scientific and technological services in the field of bio-economy, PNIII-P1-1.2 PCCDI 2018, (2018-2020) <https://sweetconomy.com>

Robust fractional order event-based control for optimised resource allocation in complex cyber-physical closed loop systems, PN-III-P1-1.1-TE-2016-1396 (2018-2020), <http://cristina-muresan.com/research/te652018/>

DiSoSys - Intrathoracic tumors Diagnosis System based on ultrasonography and molecular biomarkers, PNIII-P2-2.1-PED-2016-0425 (2017-2018) <https://roxana-eu.wixsite.com/disosys>

BIOFIT – “Effective use of crude biodiesel glycerol in lactic acid production”, PNIII-P2-2.1-PED-2016-1237, (2017-2018), <https://biofitped.weebly.com/diseminare.html>

Scalable experimental setup of nanorobot dynamics in Non-Newtonian fluids for fractional order modelling and control, PN-III-P2-2.1-PED-2016-0101 (2017-2018) (, <http://cristina-muresan.com/research/92ped2017/>

Robust, fault tolerant, fractional order control strategies with application to isotope separation cascades, PNII

TE, (2015-2017), <http://evadulf.wix.com/pnii-ru-te-38-2015-2017>)

“Novel Fractional Order Control Strategies for Vibration Suppression in Aeroplane Wings”, PN-II-RU-TE-2014-4-0598, (2015-2017) <http://cristina-muresan.com/research/te862015/>

Significant results

The most representative publications of the past 5 years:

1. EH Dulf, Simplified Fractional Order Controller Design Algorithm, *Mathematics* 7 (12), 1166, 2019
2. EH Dulf, DC Vodnar, FV Dulf, Modelling the L (+) Lactic Acid Production via R. ORYZAE NRRL 395 Fermentation on Biodiesel Crude Glycerol, *Studia Universitatis Babes-Bolyai, Chemia* 64 (2), 2019
3. L Székely, ÉH Dulf, L Kovacs, Development of an Approach to a Biologically Inspired Self-Organizing Control Structure, 2019 22nd *International Conference on Control Systems and Computer Science*
4. EH Dulf, CI Muresan, CM Ionescu, Fault-Tolerant Control of the (13C) Isotope Separation Cascade, *Mathematical Methods in Engineering*, 53-65, 2019
5. C.I. Muresan, Birs, I.R., Ionescu, C., De Keyser, R., Tuning of fractional order proportional integral/proportional derivative controllers based on existence conditions, *Proc IMechE Part I: J Systems and Control Engineering*, vol. 223, no. 4, pp. 384-391, 2019
6. EH Dulf, DC Vodnar, FV Dulf, Modeling tool using neural networks for L (+)-lactic acid production by pellet-form *Rhizopus oryzae* NRRL 395 on biodiesel crude glycerol, *Chemistry Central Journal* 12 (1), 124, 2018
7. Dulf, Eva-H.; Susca, Mircea; Kovacs, Levente, Novel Optimum Magnitude Based Fractional Order Controller Design Method Conference: 3rd *IFAC Conference on Advances in Proportional-Integral-Derivative Control (PID)* Location: Ghent Univ, Ghent, BELGIUM Date: MAY 09-11, 2018 Vol Issue: 4 Pages: 912-917, 2018
8. Dulf, Francisc Vasile; Vodnar, Dan Cristian; Dulf, Eva-Henrietta; et al., Liberation and recovery of phenolic antioxidants and lipids in chokeberry (*Aronia melanocarpa*) pomace by solid-state bioprocessing using *Aspergillus niger* and *Rhizopus oligosporus* strains *LWT-FOOD SCIENCE AND TECHNOLOGY*, 2018, 87: 241-249.
9. C. I. Muresan, E. H. Dulf, and R. Both, Vector-based tuning and experimental validation of fractional-order PI/PD controllers, *Nonlinear Dynamics*, vol. 84, pp. 179-188, Apr 2016.
10. C. I. Muresan, E. H. Dulf, C. Copot, R. De Keyser, and C. Ionescu, Design and analysis of a multivariable fractional order controller for a non-minimum phase system, *Journal of Vibration and Control*, vol. 22, pp. 2187-2195, 2016.
11. C. I. Muresan, A. Dutta, E. H. Dulf, Z. Pinar, A. Maxim, and C. M. Ionescu, Tuning algorithms for fractional order internal model controllers for time delay processes, *International Journal of Control*, vol. 89, pp. 579-593, 2016.
12. C. I. Muresan, E. H. Dulf, C. Copot, R. De Keyser, C. Ionescu, Design and analysis of a multivariable fractional order controller for a non-minimum phase system, *Journal of Vibration and Control*, vol. 22, pp. 2187-2195, 2016.

Significant solutions:

Monitoring, modelling and control of isotope separation processes and separation cascade

Fractional order control strategies for time delay and MIMO processes

Products and technologies:

1. Mathematical models of complex chemical and biochemical processes
2. Special transducer for cryogenic liquid nitrogen level in the condenser of an isotope separation column
3. Special transducer for carbon monoxide level in the boiler of an isotope separation column
4. Monitoring system for ¹³C cryogenic isotope separation column
5. Advanced control strategies for ¹³C cryogenic isotope separation column and a separation cascade
6. Frequency analyzer based on a direct, simplified algorithm

Patents:

1. R.A. Munteanu, E.H. Dulf, C. Festila, R. Munteanu, G. Todoran, “Analogue electronic transducer for measuring power in direct current circuits, RO-128666/2018
2. Experimental unit for studying the fractional order characteristics of non-Newtonian fluids, Romanian patent proposal no. A00389/31.05.2018
3. Process for tuning fractional controllers for multivariable processes with deadtimes, , RO132450-A2/2016
4. Wind turbine, RO133354-A2/2017
5. Procedure for detection and diagnosis of intrathoracic pulmonary tumours based on ultrasound image analysis, Patent proposal A01040/04.12.2018

The offer addressed to the economic environment

Research & development	Identifying fundamental principles and methodologies that enable systems to exhibit intelligent, goal-oriented behaviour, and developing innovative instruments to monitor, manipulate, and control systems Tuning, design and testing of various control solutions using advanced control algorithms, such as predictive, fractional or robust control Modelling biochemical and biomedical processes
Consulting	Consulting in simulation, design, implementation and maintenance of control systems for multiple industrial field; Consulting in structural and nonlinear modelling of complex processes Consulting in process management using different simulation environment
Training	Complex process modelling and simulation Tuning, design and testing of various control solutions including advanced control algorithms such as predictive, fractional or robust control

ROBOTICS AND NONLINEAR CONTROL

Contact details

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Areas of expertise

Our group works on **Robotics and Nonlinear Control (ROCON)** at the Department of Automation of the Technical University of Cluj-Napoca. Our research interests range from mobile robotics and robot modeling, to fundamental nonlinear control and estimation using methods from computational and artificial intelligence. These two major directions are connected via applications of nonlinear control to robotics.

Team

Professors: Lucian Busoniu, group lead, Gheorghe Lazea, honorary member
Associate Professors: Zsofia Lendek, Levente Tamas
Assistant Professors: Alexandru Codrean, Cosmin Marcu, Tassos Natsakis
PhD and long-term research students: Ioana Lal, Amalia Matyas, Daniel Mezei, Zoltan Nagy
Technician: Adrian Lucaci

Representative projects (selection of 5 recent projects)

Search, Identification, and Collection of Marine Litter with Autonomous Robots (SeaClear), H2020 Research & Innovation Action, 2020-2023, PI Lucian Busoniu, <https://seaclear-project.eu/>
Estimation and control of delayed periodic systems: Application to engine optimization (ECOPACE), Young Teams grant, 2018-2020, PI Zsofia Lendek, <http://lendek.net/TE11/>
A Learning Aerial Guide for the Elderly and Disabled (AIRGUIDE), Young Teams grant, 2018-2020, PI Lucian Busoniu, <http://airguide.busoniu.net/>
Active perception for flexible manipulation in intelligent manufacturing (TEAMFIT), Bridge Grant, 2016-2018. PI Levente Tamas, http://rocon.utcluj.ro/~levente/?page_id=291
Biomechanically Enabled robotic controlER for REstoring Human Ability (BETER REHAB), National Postdoctoral Grant, 2018-2020, PI Tassos Natsakis. <https://beterrehab.eu/en/>

Significant results

Selection of 5 representative publications in the past 5 years

L. Busoniu, J. Ben Rejeb, I. Lal, I.-C. Morarescu, J. Daafouz 2020, *Optimistic minimax search for noncooperative switched control with or without dwell time*. Automatica, vol. 112.
Frohlich R, Tamas L, Kato Z. 2019. *Absolute Pose Estimation of Central Cameras Using Planar Regions*. IEEE Transactions on Pattern Analysis and Machine Intelligence.
Boey H, Verfaillie S, Natsakis T, Sloten J Vander, Jonkers I. 2019. *Augmented Ligament Reconstruction Partially Restores Hindfoot and Midfoot Kinematics After Lateral Ligament Ruptures*. Am J Sports Med.
Feng G, Buşoniu L, Guerra T-M, Mohammad S. 2019. *Data-Efficient Reinforcement Learning for Energy Optimization of Power-Assisted Wheelchairs*. IEEE Transactions on Industrial Electronics. 66:97340–97344
Zs. Lendek, Z. Nagy, J. Lauber, *Local stabilization of discrete-time TS descriptor systems*. Engineering Applications of Artificial Intelligence, vol. 67, pages 409-418, 2018.

Patent: Automatic Obstacle Detection and Breaking System for Cars, nr A10006/16.02.2011: L. Tamas, Gh. Lazea.

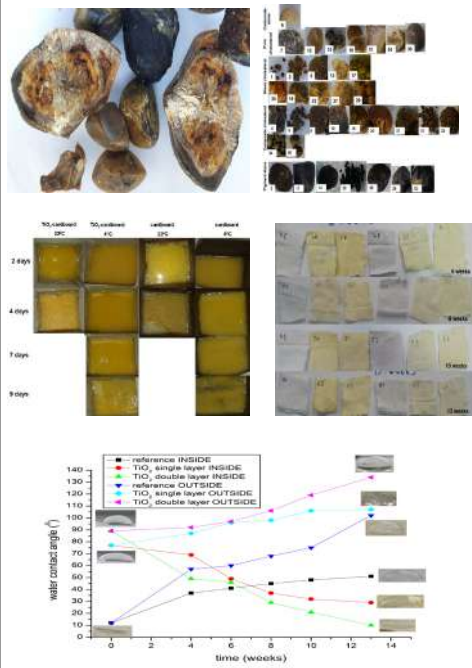
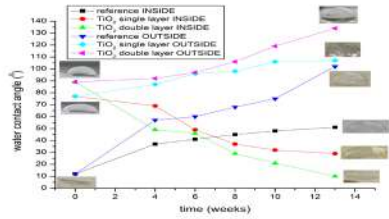
What we offer to the economic environment

Research & development	Signal processing Control algorithms Monitoring and estimation Artificial intelligence and machine learning. Mobile robotics and robotic manipulation Advanced system control and monitoring Embedded software design
Consulting	Control system design and development Monitoring system design and development Robotic system design & engineering 2D and 3D mapping and surveys
Applied engineering services	Process and control engineering Robotics related services Process equipment related services
Training	Control and monitoring System identification Optimization and optimal control Computer integrated manufacturing Process equipment Industrial robotics Mobile vehicles

CENTER OF SCIENTIFIC RESEARCH OF ENVIRONMENT, FOOD AND HEALTH SAFETY- CCESMAS

PHYSICAL-CHEMICAL ANALYSIS

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e-mail	ancamihalycozmata@gmail.com	

Areas of expertise

Food safety and security: • Food control; • Functional food; • Traceability of contaminants along of food chain • Active food packages

Environment: • Environment monitoring: wastes, organic and inorganic pollutants from different matrices • Recovery of valuable metals from different wastes (including also the mining water wastes)

Science of material: • Nanomaterials based on titania, silica and noble metals: preparation, characterization and applications in depollution, recovery of metals, self cleaning, food preservation, etc...

Chemometry: • Statistically processing the experimental data; • Mathematical modelling of experimental data

Team

Prof. Dr. Eng. Anca Mihaly Cozmata (coordinator), Associate Prof. Dr. Camelia Nicula, Associate Prof. Dr. Anca Peter, Associate Prof. Dr. Eng. Leonard Mihaly Cozmata

Representative projects

FOODCHAIN4EUROPE - HIGH QUALITY FOOD CHAIN 4 EUROPE – INTERREG IV (2017-2022)

GRAFOOD – “Active GRAphene based FOOD packaging systems for a modern society”, PNIII-P3-3.2

COFUND-M-ERA.NET II-GRAFOOD, (2017-2020)

STRUCTural and PHOtochemical investigations of a nanosized composite as active component of paper based PACKAGE designed for food applications (STRUCT-PHO-PACK) – Romania-Russia bilateral projects; 2017-2018.

4517-3-16/18; 01-3-1115-2014/2018

SMARTPACK-“Smart functions of packages containing nano-structured materials in food preservation”, (2012-2015)

DAC, “Analysis and physically-chemically characterization of liquid and solid samples”, (2012-2014)

RIVAM, “Rehabilitation of tailings ponds by application of amendments and cultivation of vegetal species with high adaptability to the heavy metals”, <http://chimie-biologie.ubm.ro/RIVAM/> (2008-2011)

BIOMEG, “Bioaccumulation of heavy metals in soil-vegetables-human chain”,

<http://chimie-biologie.ubm.ro/biomeg/index.html> (2008-2011)

AIBD, “Integrated application of databases for adopting and restructuring of protection natural and artificial factors in zootechnic farms”, (2005-2008)

SIG, “Designing the hazards charts and environment assessment in mining areas of Maramures and Satu Mare counties using GIS”, (2005-2008)

ZEMIP, “Developing of a biophysical system based on zeolites-microorganisms-vegetal species for ecoremediation of tailing ponds coming from gold-silver preparation industry”, <http://chimie-biologie.ubm.ro/zemip/> (2009-2011)

Significant results

Active packages for food industry

Polypropylene flask modified with Ag/TiO ₂ -based nanocomposite	Polypropylene flask modified with Au/TiO ₂ – based nanocomposite	Paper sheet modified with Ag/TiO ₂ nanocomposite
Flexible film with graphene	Paper packaging based on graphene	Paper packaging with self-cleaning properties

The most representative publications of the past 5 years

1. A. Peter, C. Nicula, L. Mihaly-Cozmata, A. Mihaly-Cozmata. New active package based on titania coated on cardboard for storage of fresh prepared orange juice. J Food Process Eng. 2019, 42(2), Article Number: e12965
2. A. Peter, A. Mihaly-Cozmata, C. Nicula, L. Mihaly-Cozmata, A. Vulpoi, L. Baia. Fabric impregnated with TiO₂ gel with self-cleaning property, Int. J. Applied Ceram. Technol. 2019, 16(2), 666-681
3. R. Apjok, A. Mihaly Cozmata, A. Peter, L. Mihaly Cozmata, C. Nicula, M. Baia, A. Vulpoi-Active packaging based on cellulose-chitosan-Ag/TiO₂ nanocomposite for storage of clarified butter. Cellulose (2019) 26: 1923.
4. T. Wojciechowski, A. Rozmysłowska-Wojciechowska, G. Matyszczyk, M. Wrzecionek, A. Olszyna, A. Peter, A. Mihaly-Cozmata, C. Nicula, L. Mihaly-Cozmata, S. Podsiadło, D. Basiak, W. Ziemkowska, A. Jastrzębska - Ti₂C MXene Modified with Ceramic Oxide and Noble Metal Nanoparticles: Synthesis, Morphostructural Properties, and High Photocatalytic Activity, Inorganic Chemistry, 2019, 58, 7602–7614.
5. Peter, Anca; Nicula, Camelia; Mihaly-Cozmata, Leonard; et al., An efficient and innovative method to preserve the harvested plums during storage. Journal of Food Processing and Preservation, 42(1), e13398, 2018
6. Mihaly-Cozmata, Anca; Peter, Anca; Craciun, Grigore; et al., Preparation and characterization of active cellulose-based papers modified with TiO₂, Ag and zeolite nanocomposites for bread packaging application. Cellulose, 24(9), 3911-3928, 2017
7. Peter, Anca; Mihaly-Cozmata, Anca; Nicula, Camelia; et al., Assessment of TiO₂ photoactivity on the lead removal: kinetic and mechanistic processing. Water Science and Technology, 75(11), 2508-2519, 2017.
8. Peter, Anca; Mihaly-Cozmata, Anca; Nicula, Camelia; et al., UV Light-Assisted Degradation of Methyl Orange, Methylene Blue, Phenol, Salicylic Acid, and Rhodamine B: Photolysis Versus Photocatalysis Water Air and Soil Pollution 228(1), Number: 41, 2017
9. Anca Peter et al., "Changes in the microbiological and chemical characteristics of white bread during storage in paper packages modified with Ag/TiO₂-SiO₂, Ag/N-TiO₂ or Au/TiO₂", Food Chemistry 197, 790–798, 2016.
10. István Lázár, József Kalmár, Anca Peter, Anett Szilágyi, Enikő Győri, Tamás Ditrői, István Fábián. "Photocatalytic performance of highly amorphous titania-silica aerogels with mesopores: The adverse effect of the in situ adsorption of some organic substrates during photodegradation", Applied Surface Science 356, 521–531, 2015.
11. Anca Mihaly Cozmata et al., "Preparation and characterization of improved gelatin films incorporating hemp and sage oils", Food Hydrocolloids 49, 144-155, 2015
12. Anca Peter et al., "Silver functionalized titania-silica xerogels: Preparation, morphostructural and photocatalytic properties, kinetic modeling", Journal of Alloys and Compounds, 648, 890-902, 2015.

Patent:

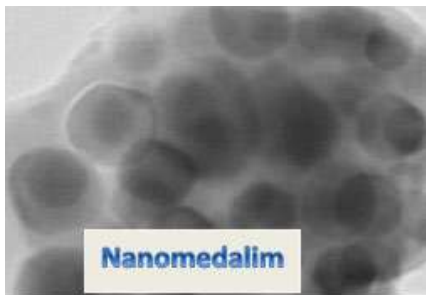
Methods to obtain intelligent packages containing nano-structured materials used in food preservation -European patent, filing No. 1023377/ 28.08.2015

The offer addressed to the economic environment

Research & development	Pollution monitoring; Rehabilitation of polluted areas; Physical-chemical control and expertise of food; Food packaging; Nanomaterials: preparation, characterization, application; Recovery of valuable metals (Au, Ag, Cu) from wastes; Waste waters treatment; Application of nanomaterials in environment deppolution; Intelligent and active food packages: nano-packages; bioactive edible films;
Consulting	Technologies for remediation of polluted soils; Technologies for recovery of valuable metals from wastes (Cu, Au, Ag); Food packaging; Food safety;
Applied engineering services	Technologies for remediation of polluted soils; Technologies for recovery of valuable metals from wastes (Cu, Au, Ag); Physical-chemical analysis of solid and liquid samples; Analysis of mineral elements in different matrices
Training	Operation of analysis equipment (FTIR, TOC, Analyst Perkin Elmer 800); Statistically processing of experimental data; Nanomaterials: preparation, characterization and applications; Food packaging.

NANOMATERIALS AND APPLICATION IN ENVIRONMENTAL AND FOOD ANALYSIS

Contact details

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Cromatograf de lichide HPLC YL 9100

Areas of expertise

Synthesis and characterisation of nanoparticles embedded in silica, polyvinilalcohol and PVA-SiO₂ matrix

- synthesis of the nanocomposit oxdic system $\text{Co}_x\text{Fe}_{3-x}\text{O}_4$; $\text{Co}_x\text{Fe}_{3-x}\text{O}_4$ $\text{Ni}_x\text{Co}_{1-x}\text{Fe}_2\text{O}_4$, $\text{Ni}_x\text{Zn}_{1-x}\text{Fe}_2\text{O}_4$, $\text{Zn}_x\text{Co}_{1-x}\text{Fe}_2\text{O}_4$ oxdic system nanoparticles embedded in silica, PVA and PVA-SiO₂
- analysis and interpretation of thermal analysis curves (TG-DTG-DTA) coupled to MS, interpretation of FT-IR spectrometry data, interpretation of the Mossbauer spectra interpretation of the BET adsorption isotherms
- interpretation of electron microscopy SEM +EDX and TEM + EDX and atomic force microscopy (AFM)
- tracing and interpretation of magnetic behaviour, assessment of photocatalytic activity and coloristic properties of nanomaterials

Environmental chemistry. Mathematical modelling of environmental data;

- Assessment of the degree of soil pollution due to microelements content; assessment of the health risk associated with the consumption of plants cultivated on polluted areas, transfer of microelements from soil to plant, study of the influence of ionic exchange processes on microelements transfer in the soil-plant system; QSPR/QSAR studies
- Air quality analysis and monitoring; Analysis of air pollutant and their spatial and temporal distribution; analysis of wet air deposition
- Analysis of physico-chemical parameters of water and the interpretation of their trend; assessment of the water quality in water reservoirs, lakes, groundwater, glacial lakes and drinking water supply network, assessment of the impact of anthropogenic activities on water quality parameters, chemical modelling of groundwater quality in the aquifer; calculus of heavy metal pollution index, heavy metal evaluation index; human health risk assessment; water quality index, spectrometric analysis by molecular absorption spectrometry and by atomic absorption spectrometry; mathematical modelling of environmental data; drawing the map of the heavy metal distribution in the water reservoirs.

Physico-chemical and sensory characterization of food

- Assesment of hydrolysis and oxidation processes in animal fats; monitoring of chemical parameters during storage
- increasing the oxidative stability of alimentary fat by the addition of antioxidants; Assessment of physico-chemical and sensorial parameters of wines;
- Chromatographic analysis of food components by HPLC, GC and thin layer chromatography

Team

Assoc. prof. dr. Cristina Mihali; Assoc. prof. dr. Zoita Marioara Berinde ; Lecturer dr. eng. Claudia Butean, Assoc. prof. dr. eng. Thomas Dippong, Lecturer dr. eng. Flavia Pop

Assoc. prof. dr. Cristina Mihali; Assoc. prof. dr. Zoita Marioara Berinde ; Lecturer dr. eng. Claudia Butean, Assoc. prof. dr. eng. Thomas Dippong, Lecturer dr. eng. Flavia Pop

Representative projects

CLAMROUA, “Clean Air Management in the Romania - Ukraine Transboundary Area”, European Union, Hungary-Slovakia-Romania-Ukraine, ENPI- Cross-border Cooperation Program project, <http://www.territorialcooperation.eu/frontpage/show/20419> (2013-2015)
Creșterea stabilității chimice a grăsimilor animale bogate în acizi nesaturați prin adaosul de antioxidanți, GNaC ARUT 2018, Universitatea Tehnică din Cluj-Napoca, Centrul Universitar Nord din Baia Mare, <https://research.utcluj.ro/index.php/competitii-nationale.html>

Infrastructure

HPLC YL INSTRUMENT 9100, produced in 2016
Spectrophotometer Perkin Elmer, produced 2014
Turbidimeter WTW, produced 2010
Gas chromatograph INTUVO, Agilent 2019
WTW pH-meter, produced 2014

Significant results

The most representative publications of the past 5 years:

- T.Dippong, C.Mihali, Z.Voșgan, A. Avram, Z.Berinde, A.Dumuța**, Establishment of physico-chemical and microbiological parameters of some red wine assortments by comparative analysis. *Revista de chimie*, 2020, vol 71 (1), 411-415
- T.Dippong, C.Mihali, MA. Hoaghia et al.**, Chemical modeling of groundwater quality in the aquifer of Seini town - Somes Plain, Northwestern Romania, *Ecotoxicology and environmental safety*, 2019, 168, 88-101.
- F.Pop, D.Năsui, Z. Voșgan, C.Mihali, C.Butean**, Chemical stabilization of fats rich in long chain polyunsaturated fatty acids by antioxidants addition, *Studia Universitatis Babes-Bolyai Chemia*, 2019, 64(1), 173-184.
- F.Pop, Z.Voșgan**, Increasing the shelf life of alimentary poultry fat by β -carotene and ascorbic acid addition, *Proceedings of the Multidisciplinary Conference on Sustainable Development*, 2019
- T. Dippong, C.Mihali, G. Ardelean**, Seasonal variation of fizico-chemical parameters in the drinking water supply network of Satu Mare city, NW Romania, *Environmental Engineering and Management Journal*, 2019, 18(3), 1-10.
- T. Dippong, A. Avram, C. Mihali**, Gaz-chromatography assessments of the major volatile compounds in traditional fruit brandies throughout fruit and wood maturation, *Studia Universitatis Babes-Bolyai*, 2019, 64(4), 141-155
- T. Dippong, E.A. Levei, I.G. Deac, F.Goga, O.Cadar**, Investigation of structural and magnetic properties of $\text{Ni}_x\text{Zn}_{1-x}\text{Fe}_2\text{O}_4/\text{SiO}_2$ ($0 < x < 1$), *Journal of Analytical and Applied Pyrolysis*, 2019, 144, 104713 Published Nov 2019.
- T. Dippong, E.A. Levei, F. Goga, I. Petean, A. Avram, O.Cadar**, The impact of polyol structure on the formation of $\text{Zn}_{0.6}\text{Co}_{0.4}\text{Fe}_2\text{O}_4$ spinel-based pigments, *Journal of Sol-Gel Science and Technology*, 2019, 92, 736-744
- T. Dippong, C. Mihali, D. Nasui, Z.Berinde, C.Butean**, Assessment of water physicochemical parameters in the Strimtori-Firiza reservoir in Northwest Romania, *Water environment research*, 2018, 90 (3), p. 220-233
- Z. Berinde, T.Dippong, C.Butean**, QSPR Study on Transition Temperature of Tetraphenylethene - Derived columnar Liquid Crystals, *Studia Universitatis Babes-Bolyai*, 2016, 61(1), 51-62.
- F.Pop, C.A. Semeniciu, L. Mihalescu**, Oxidative and hydrolytic stability of alimentary poultry fats under refrigeration and freezing, *European Journal of Lipid Science and Technology*, 2016, 118(11), 1795-1798.
- F.Pop, L. Mihalescu**, Effects of α -tocopherol and citric acid on the oxidative stability of alimentary poultry fats during storage at low temperatures, *International Journal of Food Properties*, 2016, DOI 10.1080/10942912.2016.1199037.

Products and technologies:

- Obtaining of $\text{Co}_x\text{Fe}_{3-x}\text{O}_4$, $\text{Ni}_x\text{Co}_{1-x}\text{Fe}_2\text{O}_4$, $\text{Ni}_x\text{Zn}_{1-x}\text{Fe}_2\text{O}_4$, $\text{Zn}_x\text{Co}_{1-x}\text{Fe}_2\text{O}_4$ oxidic system nanoparticles embedded in silica, PVA and PVA- SiO_2 matrix with structural, morphological, magnetic and photocatalytic activities.
- Studies on the impact of anthropogenic activities on water quality parameters, chemical modelling of groundwater quality in the aquifer, Modelling seasonal variation of physico-chemical parameters in the drinking water supply network.
- Gaz-chromatography method for analysis of fruit brandies and wine components
- Method of determination of the microelements transfer factors from soil to plant
- Method of assessment the risk on the health consumers due to the consumption of vegetables grown on contaminated areas with microelements

The offer addressed to the economic environment Research & development	Depollution solution using nanotechnology Determination of soil characteristics related to the transfer process of the pollutant elements from soil to plants; Quantifying the impact of microelements in soil on the plants grown in areas with historical anthropogenic pollution and comparison with unpolluted reference areas. Studies on air pollution sources. Develop the "Action Plan for Good Air Quality Maintenance in Maramures County"
Consulting	Modelling the transfer factors soil-plant and the traceability of microelements on the food chain soil-plant-food-human. Human health risk assessment in areas polluted with microelements.
Training	Training on the nanoparticles synthesis and their application in environment and food analysis, Training on the negative effects of microelements on human health, measures of minimizing the risk to health.

ENVIRONMENTAL PROTECTION THROUGH CONSERVATION AND REMEDIATION

Contact details

Name	Environmental Protection through Conservation and Remediation
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Areas of expertise

Assessment of biodiversity in natural and anthropogenic ecosystems, the conservation or remediation of degraded lands in perspective by promoting restoration of natural habitats.
Identifying, testing and application of combinations of species including microorganisms (bacteria, cyanoficee), fungi and plants able to remedy degraded soils and stimulate the installation of natural habitats.
Recovery of copper through bio-technological procedures from the low-grade ores.
Applied research on tissue culture and plants multiply "in vitro".

Team

Assoc. Prof. Dr. Marian Jelea, Assoc. Prof. Dr. Monica Marian, Assist. Prof. Dr. Stela-Gabriela Jelea, Assist. Prof. Dr. Oana Mare Roșca, Assist. Prof. Dr. Lucia Mihailescu

Representative projects

„Drawing proper assessment study in order to obtain the environmental permit”, contract with industry, 2016-2017
“Monitoring action microbiota in order to use them in the soil remediation ponds”, PNII, (2007-2010)
“We can refund flowers borrowed from our children?”, Environment Fund Administration, (2008-2009)
“Conservation of biodiversity and ecological reconstruction of the lower basin of the River Tour - Adrian pond” AFM, (2007-2008)
„Evolution of installation of iron and sulphur oxidizing bacteria in the sulphidic mine wastes and their influence in generating acid mine drainage”, GRANT CNCIS, <http://194.102.64.7/GranturiFinalizate/faces/Projects/ProjectDetails.jsp> (2007-2008)

Significant results

The most representative publications of the past 5 years:

1. **Oana Mare Roșca**, Thomas Dippong, **Monica Marian**, Cristina Mihali, **Lucia Mihailescu**, Maria-Alexandra Hoaghia, **Marian Jelea**. Impact of anthropogenic activities on water quality parameters of glacial lakes from Rodnei mountains, Romania. Environmental Research, Volume 182. Published: March 2020.
2. Damian F., **Jelea S.G.**, Lăcătușu R., Mihali C. The treatment of soil polluted with heavy metals using the *Sinapis alba* l. and organo zeolitic amendment. Carpathian Journal of Earth and Environmental Sciences, Vol. 14, No. 2, p. 409 - 422. Published: 2019.
3. **Jelea S.G.**, **Jelea M.**, **Mihailescu L.**, Voșgan Z., Jelea O.C. Monitoring Food Additives and Nutritional Composition of Labels of Food Bases. Bulletin USAMV, series Agriculture 76(1): 40-45. Published: 2019.
4. **Mihailescu L.**, **Marian M.**, **Jelea S.**, Pop, F., Maxim A., Voșgan Z. Research Concerning the Fighting of *Polystigma rubrum* Fungi under the Climate Conditions of Șomcuta Mare Area Bulletin UASVM series Agriculture 76(2): 73-77. Print ISSN 1843-5246; Electronic ISSN 1843-5386. Published: 2019.
5. Voșgan Z., **Jelea S.**, **Marian M.**, **Roșca-Mare O.**, **Mihailescu L.** Assessment of Biomass Production on Pastoral Meadows in the Gutai Mountains. Bulletin UASVM series Agriculture 76(2): 109-110. Published: 2019.
6. **Monica Liliana Marian**. Possibilities of Sustainable Development in Protected Natural Areas. Case Study - Lazuri Village Overlaid with ROSCI 0214 Tur and ROSPA RIVER 0068 the Lower Meadow of the Tour. Proceeding of the International Conference Communication, Context, Interdisciplinarity, ISBN: 8624 978 606 – 14-3, p. 57-63.

Published: 2019.

7. **Monica Liliana Marian.** Local Community Support to Polluted Sites Management. Proceeding of the International Conference Communication, Context, Interdisciplinarity, ISBN: 8624 978 606 – 14-3: p. 64-69. Published: 2019.
8. **Mihalescu L., Voşgan Z., Marian M., Jelea S., Mare Roşca O.,** Pop, F., Maxim A., Cordea M. Studies Regarding the Combat of the Braches Burns Produced by the *Phomopsis vaccinii* at Blueberry Bushes Cultivated in Maramures county. Bulletin USAMV, series Agriculture 75(2): 87–92. Published: 2018.
9. Z Voşgan, L Mihalescu, S Jelea, A Dumuţa, F Pop, The Hygienic Quality of Raw Romanian Goat Milk Depending on the Milking Season Bulletin USAMV series Agriculture 75(1), 50-53. Published: 2018.
10. Z Voşgan, L Mihalescu, R Vidican, M Marian, S Jelea, O Mare. Monitoring the Vegetation Communities on the Southern Slope of the Gutai Mountains on the Basis of Ecological Indices Bulletin USAMV series Agriculture 75(1), 54-55. Published: 2018.
11. **Monica Marian, Oana Mare Roşca, Lucia Mihalescu, Zorica Voşgan.** Antifungal Effect of Spice Extracts - Possible Solutions for Biological Preservation of Food. Journal of Faculty of Food Engineering, Ştefan cel Mare University of Suceava, Romania, Volume XVII, Issue 2, 103 – 112. Published: 2018.
12. Alexandru Laposi, Aurel Ardelean, **Monica Marian,** Aspects of invasive plants dominated habitats use by marsh warbler (*Acrocephalus palustris*) in Someş river floodplain. Carpathian Journal of Earth and Environmental Sciences, Volume: 13 Issue: 2, Pages: 515-521. Published: 2018.
13. **Mare Roşca Oana, Marian, M.** Alexandra Erica Puşcaş, Edita Agneta Pop, Claudia Marian and Daniel Năsui. Positive and Negative Impacts of Tourism in Breb Village. In Proceedings of the 32nd International Business Information Management Association Conference (IBIMA), 15-16 November 2018 Seville Spain. Vision 2020: Sustainable Economic Development and Application of Innovation Management from Regional expansion to Global Growth. 5216-5219 p. ISBN: 978-0-9998551-1-9. Published: 2018.
14. Claudia Marian, **Monica Marian, Mare Roşca Oana,** Daniel NASUI, **Lucia MIHALESCU,** Zorica Vosgan and Ighian Diana. Socio-Economic Assessment of Measures to Preserve the Quality of Water Indispensable to Ecological Tourism. Proceedings of the 32nd International Business Information Management Association Conference (IBIMA), 15-16 November 2018 Seville Spain. Vision 2020: Sustainable Economic Development and Application of Innovation Management from Regional expansion to Global Growth. 5205-5218 p. ISBN: 978-0-9998551-1-9. Published: 2018.
15. Voşgan, Z., **Mihalescu, L., Jelea, M., Marinar, M.,** Dumuţa A., Pop, F., **Mare Roşca O.,** Blidar, C.F. The incidence of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) in raw goat milk collected during different seasons. Analele Universităţii din Oradea, Fascicula de Biologie, Tom XXIV, Issue 2, pp. 66-69. Print-ISSN: 1224-5119; CD-ISSN: 1842-6433; e-ISSN: 1844-7589. Published: 2017.
16. Viorica, Cosier; Marian, Monica. The advent of genomics and its potential contribution to the development of quantitative genetics Romanian Biotechnological Letters. Volume: 22 Issue: 5 Pages: 12847-12859 Published: SEP-OCT 2017.
17. **Mare Roşca Oana,** Pop, R., **Marian, M., Mihalescu, L.,** Voşgan, Z., Glodean, I. Water quality assessment of the Usturoi Valley assisted by the macrozoobenthic bioindicators. Scientific Bulletin Series D: Mining, Mineral Processing, Non-Ferrous Metallurgy, Geology and Environmental Engineering, 31 (1): 83-89. Published: 2017.
18. **Jelea S.G., Jelea M.,** Vosgan Z., **Mihalescu L.,** Jelea O.C. Copper toxicity on *Triticum aestivum* L and *Lactuca sativa* L: effects on germination and growth. Bulletin of University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Agriculture, Vol. 73(2): 253-261. ISSN 1843-5246, e- ISSN: 1843-5386. Published: 2016.
19. A. Dumuta, Z. Vosgan, M. Jelea, F. Pop, T. Dippong, L. Mihalescu, C. Mihali. Microbiological Aspects Considering the Production of Nutraceutical Curd Containing Onion, Animal Science and Biotechnologies, Vol.49, nr. 2, pp. 40-45. Published: 2016.

The offer addressed to the economic environment

Research & development	Evaluation of species of flora / fauna, microorganisms, fungi, from natural and anthropogenic habitats in order to protect themselves or to remedy environmental. Identifying biological methods based on the use of complex organisms able to reduce contamination of soil / water and facilitate the restoration of ecosystems; Identification of plant extracts alelopatic greenhouse (natural pesticides) in weed control and phytopathogenic; In vitro multiplication of species of plants for remediation and / or cultivation; The analysis, monitoring and diminishing of the effects produced by the polluting factors from industry; Evolution of installation of iron and sulphur oxidizing bacteria in the sulphidic mine wastes and their influence in generating acid mine drainage; Research studies for native vegetation installed in the acidic mine waste areas. Recovery of copper through biotechnological procedures from the low-grade ores. Reducing acid mine drainage (AMD) phenomena through passive methods.
Consulting	Structure and function in natural ecosystems and to restore contaminated their. Growing plants in different conditions of land polluted and / or contaminated. Evaluation of medical resources in the spontaneous flora, possible methods for obtaining the active principles of tissue culture.
Training	Structure and function in natural ecosystems and to restore contaminated their. Growing plants in different conditions of land polluted and / or contaminated. Evaluation of medical resources in the spontaneous flora, possible methods for obtaining the active principles of tissue culture.

FOOD INDUSTRY GROUP

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Areas of expertise

Food Engineering

Fermentation technology, biotechnology, extractive technology.

Dairy industry:

- milk-processing in order to obtain consumption milk and other dairy products;
- laboratory tests to check the conformity of raw materials and finished products.

Food quality control:

- features that different foods must meet to fit existing standards,
- quality control of the process streams to obtain food,
- laboratory tests to verify compliance with various control parameters.

Microbiology of food

- **Hygiene of food companies**

Team

Assoc. Prof. Dr. Liviu Giurgiulescu, Assist. Prof. Dr. Anca Dumuța, Assist. Zorica Voșgan Marcela,

Representative projects

- "Research mobility within SEE Grants 2014-2021" – 2018
- Development of Edible Films to Enhance Shelf-life of Muscle Foods, EEA-RO-NO-2018-0157
- "Guidance in order to make the beneficiary aware about the scientific areas of interest to the services provider in the field of food processing technology" – contract with industry, 2017
- "International consulting contract BAUHAUS Science Press" – 2015-2016
- Science without borders - Bridge between Central Europe and Balkan,

Significant results

ISI papers in Red zone:

1. Yakiang He, Ruolan Wang, Giurgiulescu Liviu, Qian Lu, 2017, An integrated algal-bacterial system for the bio-conversion of wheat bran treatment of rural domestic effluent, Journal of Cleaner Production Volume 165, 1 November 2017, Pages 458-467, <https://doi.org/10.1016/j.jclepro.2017.07.119>, ISSN: 0959-6526, Factor Impact 6.207
2. M. Mihaly Cozmata, L. Mihaly Cozmata, A. Peter, C. Nicula, Z. Vosgan, L. Giurgiulescu, A. Vulpoi, M. Baia, "Effect of monochromatic Far-Red light on physical-nutritional-microbiological attributes of red tomatoes during storage", SCIENTIA HORTICULTURAE, Vol.211, nr.1, pp.220-230, 2016, IF 1.538

Other publications in ISI journals

- Jakubowski, Marek; Giurgiulescu, Liviu, EDITORIAL INTRODUCTION SPECIAL ISSUE "FOOD SCIENCE, FOOD TECHNOLOGY AND EQUIPMENT IN FOOD INDUSTRY" CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 10 Issue: 5 Special Issue: SI Pages: 5-6 Published: 2018
- Sabatino, Leo; Iapichino, Giovanni; Vetrano, Filippo; et al., EFFECTS OF POLYETHYLENE AND BIODEGRADABLE STARCH-BASED MULCHING FILMS ON EGGPLANT PRODUCTION IN A

MEDITERRANEAN AREA CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 10 Issue: 3 Pages: 81-89 Published: 2018

- Dumuta, Anca; Vosgan, Zorica; Pop, Flavia; et al., Study considering the microwave pasteurization of the raw milk used for yogurt production ROMANIAN BIOTECHNOLOGICAL LETTERS Volume: 23 Issue: 2 Pages: 13511-13518 Published: MAR-APR 2018
- Cimpenu, Baduca C.; Stoica, Felicia; Muntean, Camelia; Giurgiulescu Liciu et al., INFLUENCE OF CLONE ADND ROSTOCK ON TOTAL POLYPHENOLS, CATECHIN, EPICATECHIN AND RESVERATROL IN RED WINE CABERNET-SAUVIGNON FROM SIMBURESTI VINEYARD CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 10 Issue: 2 Pages: 159-167 Published: 2018
- Gougoulas, Nikolaos; Vagelas, Ioannis; Giurgiulescu, Liviu; et al., COMPARATIVE STUDY ON POLYPHENOLS CONTENT AND ANTIOXIDANT EFFECT OF SOME GRAPE VARIETIES GROWN IN CENTRAL GREECE CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 10 Issue: 1 Pages: 141-149 Published: 2018
- Gougoulas, Nikolaos; Vagelas, Ioannis; Giurgiulescu, Liviu; et al., THE COIR SUBSTRATE FOR SOILLESS CULTURES, REUSED AS SOIL AMENDMENT (STUDY IN VITRO AND IN VIVO) CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 9 Issue: 4 Pages: 61-70 Published: 2017
- Gougoulas, Nikolaos; Giurgiulescu, Liviu; Vagelas, Ioannis; et al., CHANGES IN TOTAL PHENOL CONTENT AND ANTIOXIDANT ACTIVITY OF GREEK TABLE OLIVE CULTIVAR AMFISSIS DURING MATURATION STUDIA UNIVERSITATIS BABES-BOLYAI CHEMIA Volume: 62 Issue: 2 Pages: 387-396 Part: 2 Published: 2017
- Gougoulas, Nikolaos; Wogiatzi, Eleni; Vagelas, Ioannis; Giurgiulescu Liviu et al., COMPARATIVE STUDY ON POLYPHENOLS CONTENT, CAPSAICIN AND ANTIOXIDANT ACTIVITY OF DIFFERENT HOT PEPPERS VARIETIES (CAPSICUM ANNUUM L.) UNDER ENVIRONMENTAL CONDITIONS OF THESSALY REGION, GREECE CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 9 Issue: 1 Pages: 109-116 Published: 2017
- Gougoulas, Nikolaos; Vagelas, Ioannis; Wogiatzi, Eleni; Giurgiulescu Liviu et al., COMPARATIVE STUDY ON POLYPHENOLS CONTENT AND ANTIOXIDANT EFFECT OF OLIVE CULTIVARS FROM THE ISLAND PAROS, GREECE CARPATHIAN JOURNAL OF FOOD SCIENCE AND TECHNOLOGY Volume: 9 Issue: 1 Pages: 144-151 Published: 2017
- L. Giurgiulescu, I. Vagelas, and N. Gougoulas, "Research regarding the influence of *Penicillium chrysogenum*, *Penicillium expansum* and *Phanerochaete* spp. on chemical composition of red wines", *Romanian Biotechnological Letters*, vol. 21, pp. 11290-11297, Mar-Apr 2016.
- Cical, Elena; Mihali, Cristina; Mecea, Mircea; Dumuta Anca et al., CONSIDERATIONS ON THE RELATIVE EFFICACY OF ALUMINUM SULPHATE VERSUS POLYALUMINUM CHLORIDE FOR IMPROVING DRINKING WATER QUALITY, STUDIA UNIVERSITATIS BABES-BOLYAI CHEMIA Volume: 61 Issue: 2 Pages: 225-238 Published: 2016
- N. Gougoulas, L. Giurgiulescu, D. Kalfountzos, A. Papachatzis, I. Vagelas, D. Ftakas, et al., "COIR EMPLOYED AS SOILLESS CULTIVATION SUBSTRATE AND ITS INTERFERENCE WITH NUTRIENT SOLUTION DURING TWO TOMATOES CROPPING PERIODES (CASE STUDY)", *Studia Universitatis Babes-Bolyai Chemia*, vol. 60, pp. 177-185, Jun 2015.
- A. Dumuta, Z. Vosgan, M. Jelea, F. Pop, T. Dippong, L. Mihalescu, C. Mihali, "Microbiological Aspects Considering the Production of Nutraceutical Curd Containing Onion", *Animal Science and Biotechnologies*, Vol.49, nr.2, pp.40-45, 2016.
- Nikolaos Gougoulas, Liviu Giurgiulescu, Ioannis Vagelas, Eleni Wogiatzi, Maria Nektaria Ntalla, (2017) Phenol Content and Antioxidant Activity of Greek Table Olive Cultivar Amfissis During Maturation, *Studia Universitatis Babes-Bolyai, Chemia*, Tom2, pp. 387-396

The offer addressed to the economic environment

Consulting	Implementation of quality management systems in enterprises of food industry
Training	Education and training in the HACCP; VACCP and TACCP
Research & development	Microbiology analyses: <i>Salmonella</i>, <i>E. coli</i>, <i>Campylobacter</i>, <i>Enterobacteriaceae</i>, <i>Listeria monocytogenes</i>, NTG, NCS, Moulds and Yeasts detection, <i>Bacillus cereus</i>, <i>Coliform bacteria</i>, <i>Staphylococcus aureus</i>. Research and development in food industry and quality control and food safety Dairy industry: - Researching the possibility of replacing the classical method of pasteurization with unconventional methods, like microwave technology, microfiltration technique or the use of high pressure. Food biotechnology - Wine biotechnology; Beer biotechnology; Dairy products biotechnology; - Enzymes application in new food products.

EARTH SCIENCES, ENVIRONMENT AND SUSTAINABLE DEVELOPMENT RESEARCH CENTER

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Areas of expertise

Risk assessment of geomorphologic, climatic and soil natural hazards.
 Polluted soil geochemical surveys and mapping the distribution of heavy metals. Soil remediation by conventional methods and the use of natural resources.
 Determining the degree of pollution of the environment factors like soil and water.
 Research of zeolite tuff by optical methods and X-ray diffraction. The use of zeolite tuff in environmental protection for the restoration and petrography geology studies on rocks and minerals by using optical methods, X-ray diffraction analysis and electron microprobe. Metallogenetic studies for research perimeters of mineral resources.
 GIS database - making vector and raster files.
 GIS modeling for surface erosion, landslides and flooding simulators.

Team

Prof. Dr. Gheorghe Damian, Prof. Dr. Floarea Damian, Assoc. Prof. Dr. Gheorghe Macovei, Assist. Prof. Daniel Nasui,

Representative projects

“Correlations between the structure of naturally occurring, locally available, nano-/ microscale bentonite minerals and their physico-chemical properties” – ANCS-DUBNA, 2018
“Development of methods of stabilization and rehabilitation of soils polluted with heavy metals using zeolite resources”, CNCSIS Grant, (2006-2008)
“Telluride and selenide bearing gold-silver deposits”, UNESCO-IUGS IGCP 486 Grant, (2003-2008)
“Minerals in the system Au-Ag-Bi-Ag-X and X where X = S, Se, Te are indicators of chemical and physical parameters of genesis for epithermal deposits”, Institute of geology of ore deposits, petrology, mineralogy, and geochemistry from the Russian Academy of Sciences (IGEM RAS), (2008-2009)
“Measurements with organic tracers to establish sanitary protection zones in the Băile Oglinzi area, Tg. Neamț”, (2009)
“Mineralogy and petrography studies on samples from the Rovina perimeter”, Samax, (2008)
“Mineralogical study of samples from the Cireșata mineralization - Valea Gărzii, Brad” (2010)
“Mineralogy and petrography study based on evidence collected from boreholes made in Poprad perimeter, Maramures”, ROMALTYN SA Company, (2010)

Significant results

The most representative publications of the past 5 years:

1. Damian, Gheorghe; Andras, Peter; Damian, Floarea; et al., The role of organo-zeolitic material in supporting phytoremediation of a copper mining waste dump INTERNATIONAL JOURNAL OF PHYTOREMEDIATION Volume: 20 Issue: 13 Pages: 1307-1316 Published: NOV 10 2018
2. Damian, Gheorghe; Lanzerstorfer, Christof; Damian, Floarea; et al., Distribution of Heavy Metals and Minerals in the Various Size Fractions of Soil from CopE (TM) a Mic, RomAnia WATER AIR AND SOIL POLLUTION Volume: 229 Issue: 6 Article Number: 202 Published: JUN 2018
3. Apopei, A. I.; Damian, G.; Buzgar, N.; et al., The determination of the Sb/As content in natural tetrahedrite-tennantite and bourmonite-seligmannite solid solution series by Raman spectroscopy MINERALOGICAL MAGAZINE Volume: 81 Issue: 6 Pages: 1439-1456 Published: DEC 2017

4. Buzatu, Andrei; Damian, Gheorghe; Buzgar, Nicolae; et al., Structural key features of bismuth and Sb-As sulfosalts from hydrothermal deposits-micro-Raman spectrometry VIBRATIONAL SPECTROSCOPY Volume: 89 Pages: 49-56 Published: MAR 2017
5. Apopei Andrei Ionuț, Damian Gheorghe, Buzgar Nicolae, Buzatu Andrei, "Mineralogy and geochemistry of Pb-Sb/As-sulfosalts from Coranda-Hondol ore deposit (Romania) - Conditions of telluride deposition", *Ore Geology Reviews* 72 (2016) 857–873, 2016.
6. Andrei Buzatu, Harald G. Dill, Nicolae Buzgar, Gheorghe Damian, Andreea Elena Maftai, Andrei Ionu Apopei, "Efflorescent sulfates from Baia Sprie mining area (Romania) — Acidmine drainage and climatological approach", *Science of the Total Environment*, 542 (2016) 629–641, 2016.
7. M. Chicos, G. Damian, D. Stumbea, N. Buzgar, T. Ungureanu, V. Nica, G. Iepure, "Mineralogy and Geochemistry of the Tailings Pond from Straja Valley (Suceava County, Romania). Factors Affecting the Mobility of the Elements on the Surface of the Waste Deposit", *Carpathian Journal of Earth and Environmental Sciences*, Vol.11, nr.1, pp.265-280, 2016.
8. I. A. Baksheev, F. Damian, G. Damian, V. Y. Prokofiev, I. A. Bryzgalov, and L. I. Marushchenko, "CHEMICAL COMPOSITION OF PHLOGOPITE, TOURMALINE AND ILLITE FROM HYDROTHERMAL ALTERATIONS OF THE NISTRU DEPOSIT, BAIA MARE, ROMANIA", *Carpathian Journal of Earth and Environmental Sciences*, vol. 11, pp. 547-564, Aug 2016.
9. Buzatu, Andrei; Damian, Gheorghe; Dill, Harald G.; Buzgar, Nicolae; Apopei, Andrei I., "Mineralogy and geochemistry of sulfosalts from Baia Sprie ore deposit (Romania) - New bismuth minerals occurrence", *Ore Geology Reviews*, Volume: 65, Pages: 132-147, Part: 1, DOI: 10.1016/j.oregeorev.2014.09.016 Published: MAR 2015.
10. Andrei Ionuț Apopei, Gheorghe Damian, Nicolae Buzgar, Stanislava Milovska & Andrei Buzatu, "New occurrences of hessite, petzite and stützite at Coranda-Hondol open pit (Certej gold-silver deposit, Romania)", *Carpathian Journal of Earth and Environmental Sciences*, May 2014, Vol. 9, No. 2, p. 71 – 78
11. Cristiana L. Ciobanu, Joël Brugger, Nigel J. Cook, Stuart J. Mills, Peter Elliott, Gheorghe Damian and Floarea Damian, Grațianite, "MnBi₂S₄, a new mineral from the Băița Bihor skarn, Romania", *American Mineralogist*, Volume 99, pages 1163–1170, 2014.
12. Andrei I. Apopei, Nicolae Buzgar, Gheorghe Damian, Andrei Buzatu, 2014, "The raman study of weathering minerals from the Coranda-Hondol open pit (Certej gold-silver deposit) and their photochemical degradation products under laser irradiation", *The Canadian Mineralogist*, Vol. 52, pp. 1027-1038 (2014), DOI: 10.3749/canmin.1300054
13. I. Ianos, D. Peptenatu, G. Damian, R.-D. Pintilii, G. S. Gheorghe, "A new hypothesis to explain the unique spatial distribution of Balkan endemic nephropathy", in *Carpathian Journal of Earth and Environmental Sciences*, vol. 8, no. 1, 2013, pp. 199-206
14. A. Buzatu, N. Buzgar, G. Damian, V. Vasilache, A. I. Apopei, "The determination of the Fe content in natural sphalerites by means of Raman spectroscopy", in *Vibrational Spectroscopy*, vol. 68, 2013, pp. 220-224
15. V. B. Naumov, V. A. Kovalenker, V. Yu. Prokofiev, M. L. Tolstykh, G. Damian, F. Damian, in *Geochemistry International*, vol. 51, no. 11, 2013, pp. 876-888
16. F. Damian, G. Damian, R. Lăcătușu, C. Postolache, G. Iepure, M. Jelea, D. Năsui, "The heavy metals immobilization in polluted soils from Romania by the natural zeolites use", in *Carpathian Journal of Earth and Environmental Sciences*, 2013, vol. 8. no. 4, pp. 231-250
17. Ioana CHIRA, Gheorghe DAMIAN & Răzvan CHIRA, "Spatial distribution of heavy metals in the soils of Băița Area, Maramureș County, Romania", *Carpathian Journal of Earth and Environmental Sciences*, February 2013, Vol. 8. No. 4, 296-278

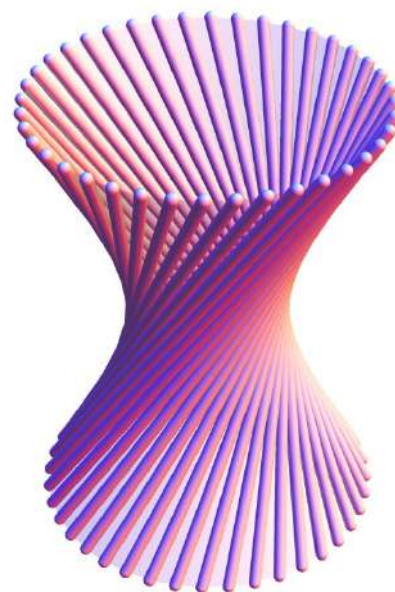
The offer addressed to the economic environment

Research & development	National mineralogy heritage and mineral resources investigation. Risk assessment of natural geomorphologic, climatic and soil hazards. GIS databases creation (vector and raster) GIS modeling for surface erosion (USLE – The universal soil erosion model), landslides (SHALSTAB, SMORPH) and flood simulation (HEC-RAS).
Consulting	The use of rocks and natural zeolites, soil type determinations. Using GIS in the creation and management of databases and in the risk assessment of natural and anthropogenic hazards. Paleontological determinations, determination of the anthropogenic pressure, management of protected areas, the use of thematic maps. Determination of sanitary blocks through the use of organic tracer method
Training	Using GIS in the creation and management of databases and in the risk

RESEARCH CENTER FOR APPLIED MATHEMATICS IN ENGINEERING SCIENCES

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Areas of expertise

Numerical Analysis

-New methods and tools in Approximation Theory; Application of *MATHEMATICA*'s approximation subroutines; High degree quadrature formulas; New algorithms for energy-minimizing curves and surfaces

Functional, Differential and Integral Equations and Calculus of Variations

-Existence and representation of single-valued and multivalued solutions. Hyers-Ulam stability of equations in algebraic and topological structures; Applications to the stability and perturbations of Dynamical Systems.

-Generalized equations of Euler-Lagrange and Euler-Gauss type used in the theory of 2D and 3D deformable models

Geometry

-Geometry of image formation in stereo vision, different camera models, calibration, system of multiple lenses and mirrors of specific type; Manifold learning and pattern recognition

Operator theory and Special functions

-Multivalued operator theory which is about the investigation of the fixed point properties of special multivalued operators; Investigating the properties of special functions, Riemann zeta, Hurwitz zeta and Polylogarithm functions

Modelling

-Ultrasound echocardiography; Computer-aided surgery (Prosthetic medicine); Dynamic image based modelling

Nonlinear and Convex Analysis and Mathematical Programming/Optimization

-Equilibrium problems; Optimization; Variational inequalities; Numerical Optimization; Numerical Optimization

Team

Prof. Dr. Math. Mircea Ivan; Prof. Dr. Math. Ioan Gavrea; Prof. Dr. Math. Ioan Raşa; Prof. Dr. Math. Alexandru Ioan Mitrea; Prof. Dr. Math. Dorian Popa; Prof. Dr. Math. Daniela Rosca; Prof. Dr. Math. Ioan Radu Peter; Assoc. Prof. Dr. Math. Daniela Inoan; Prof. Dr. Math. Alina Sîntămărian; Assoc. Prof. Dr. Math. Dalia Cimpean; Prof. Dr. Math. Bogdan Ionuț Gavrea; Assoc. Prof. Dr. Math. Adela Novac; Assoc. Prof. Dr. Math. Mircea Dan Rus; Assoc. Prof. Dr. Math. Ovidiu Furdui; Assoc. Prof. Dr. Math. Adrian Holhos; Assoc. Prof. Dr. Math. Adela Capătă

Representative projects

DynAPSNeur, "Dynamics Analysis of Parallel Simulations of Biological Neural Microcircuits", FP7 "Research Infrastructures" action (January 1 - December 30, 2013)

<http://www.hp-see.eu/hp-see-pilot-call-awarded-applications>

MoDef, "Modelling using advanced methods and techniques based on the theory of deformable surfaces with applications in computer assisted surgery and other modelling procedures of anatomic structures", PNII Partnership, <http://dicomge.utcluj.ro/modelf> (2007-2010)

"Advanced Methods and Algorithms of Mathematics related to the Theory of Deformable Models, with applications in image processing and medicine", CNCSIS, (2006-2008)

"Denoising and compression of data on high-dimensional manifolds", Deutsche Forschung Gemeinschaft, Bilateral cooperation Germany – Romania PL 170/14-1, Georg Austin University, Göttingen, (January 1 - December 31, 2011)

"Denoising and compression of spherical data", Deutsche Forschung Gemeinschaft (2007 –2010),

DESPED, "Stereo Based Object Tracking and Pedestrian Recognition in Traffic and Environments", *Wolkswagen AG, Germania* (2006-2007) , (coord. professor Sergiu Nedevschi).

CRIOAPSIM, "Laparoscopic Cryosurgical Treatment of the renal tumors individualized using simulations on 3D reconstructed model", *CEEX* (2006-2008) director TUCN prof. dr. eng. Sergiu Nedevschi (in cooperation with "Institutul Clinic de Urologie și Transplant Renal" Cluj-Napoca

Significant results

The most representative publications of the past 2 years

- Ivan, M., Neagos, V. & Silaghi, A. *A mean-value theorem for positive linear functionals*. *Monatsh Math* 189, 675–681 (2019) doi:10.1007/s00605-019-01262-0
- Abel, U., Ivan, M. *A representation formula of Bernstein operators*. *Monatsh Math* 188, 405–411 (2019) doi:10.1007/s00605-018-1164-0
- Gavrea, I., Ivan, M. *An Answer to an Open Problem on the Multivariate Bernstein Polynomials on a Simplex*. *Results Math* 74, 13 (2019) doi:10.1007/s00025-018-0938-y
- AR Baias, F Blaga, D Popa, Best Ulam constant for a linear difference equation, *Carpathian J Math.*, 35 (2019), No. 1, 13 – 22.
- Baias, A.R., Popa, D.: On Ulam stability of a linear difference equation in Banach spaces. *Bull. Malays. Math. Sci. Soc.* (2019). <https://doi.org/10.1007/s40840-019-00744-6>,
- Capata, A. Optimality conditions for ϵ -quasi solutions of optimization problems via ϵ -upper convexificators with applications. *Optim. Lett.* 13, 857-873 (2019) doi: 10.1007/s11590-018-1287-1
- Capata, A. Optimality for weakly ϵ -efficient solutions of vector optimization problems with applications. *Numer.Funct. Anal. Optim.* 40, 726-741 (2019) doi:10.1080/01630563.2019.1571510
- Cimpean D. S, Revnic C., Pop I., Natural Convection in a Square Inclined Cavity Filled with a Porous Medium with Sinusoidal Temperature Distribution on Both Side Walls, *Transport in porous media*, Volume: 130 Issue: 2 Pages: 391-404, DOI: 10.1007/s11242-019-01315-w, Published: NOV 2019
- Cimpean Dalia Sabina, Pop Ioan, Free convection in an inclined cavity filled with a nanofluid and with sinusoidal temperature on the walls: Buongiorno's mathematical model, *International journal of numerical methods for heat & fluid flow*, Volume: 29 Issue: 12 Pages: 4549-4568, DOI: 10.1108/HFF-04-2019-0317, Published: DEC 2 2019
- B. Gavrea, On a convexity problem in connection with some linear operators, *Journal of Mathematical Analysis and Applications*, Volume 461, Issue 1, 319-332, 2018. doi:10.1016/j.jmaa.2018.01.010
- Novac, A; Precup, R, Theory and computation for multiple positive solutions of non-local problems at resonance, *Journal of applied analysis and computation*, Volume: 8 Issue: 2 Pages: 486-497, Published:APR 2018, DOI: 10.11948/2018.486
- Mitrea, A.I.: On the dense unbounded divergence of interpolatory product integration on Jacobi nodes, *Calcolo*, vol.55 , no.1 (2018), <https://doi.org/10.1007/s10092-018-0253-8>,
- Holhoş, A., Roşca, D., Volume Preserving Maps Between p-Balls, *Symmetry* 11, nr. 11, 12 pp (2019) doi: 10.3390/sym11111404
- Holhoş, A., A Voronovskaya-Type Theorem for the First Derivatives of Positive Linear Operators, *Results Math* 74:76 (2019) doi: 10.1007/s00025-019-0992-0
- Holhoş, A., A sequence of positive linear operators related to powered Baskakov basis, *Carpathian J Math* 35, nr. 1, 51-58 (2019) <https://www.jstor.org/stable/26603385>
- Holhoş, A., Voronovskaya theorem for a sequence of positive linear operators related to squared Bernstein polynomials, *Positivity* 23, nr. 3, 571-580 (2019) doi: 10.1007/s11117-018-0625-y
- Acu, A.-M., Rasa, I., Estimates for the differences of positive linear operators and their derivatives. *Numer Algor* (2019) doi: 10.1007/s11075-019-00809-4
- Aral, A., Inoan, D., Raşa, I., On differences of linear positive operators. *Anal Math Phys* 9, No. 3, 1227–1239 (2019) doi: 10.1007/s13324-018-0227-7
- Rasa, I., Convexity properties of some entropies (II). *Results Math* 2019, 74:154 doi: 10.1007/s00025-019-1081-0
- Barar, A., Mocanu, G., Rasa, I., Heun functions related to entropies. *Revista de la Real Academia de Ciencias Exactas, Físicas y Naturales. Serie A. Matemáticas*, 113, No. 2, 819–830 (2019) doi: 10.1007/s13398-018-0516-x
- Acar, T., Aral, A., Rasa, I., Power Series of Positive Linear Operators. *Mediterr J Math* (2019) 16:43 doi: 10.1007/s00009-019-1313-2
- Heilmann, M., Rasa, I., A Nice Representation for a Link between Baskakov- and Szasz-Mirakjan-Durrmeyer operators and their Kantorovich variants. *Results Math* (2019) 74:9.
- Aral, A., Inoan D., and Rasa, I., Approximation properties of Szasz-Mirakyan operators preserving exponential functions. *Positivity* (2019) 23:233–246 doi: 10.1007/s11117-018-0604-3

The offer addressed to the economic environment

Research & development	Development of original solutions for modelling dynamic 3D environments; Development of real-time perception systems for structured or unstructured 3D environments, applied to driving assistance systems, autonomous robots, space observation, or computer assisted medical diagnosis.
Consulting	Consulting, design, research in pattern recognition, machine learning for industrial and scientific fields.
Training	Image processing basics: Image processing algorithms and techniques, pattern recognition, machine learning, kernel methods with applications in different fields (computer vision, neuroscience, medical, speech recognition); Numerical optimization algorithms, time stepping schemes for rigid body systems with applications to robotics, autonomous navigation and granular materials.

APPROXIMATION METHODS AND CALCULUS OF VARIATIONS IN DEFORMABLE MODELS APPLIED IN IMAGE PROCESSING AND COMPUTER ASSISTED MEDICINE - RESEARCH LABORATORY

Contact details

Name	Approximation methods and Calculus of Variations in Deformable Models applied in Image Processing and Computer Assisted Medicine – Research Laboratory	
Acronym	LC MoDef	
Logo		
Site	http://dicomge.utcluj.ro/modef	
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Director	Prof. Dr. Math. Alexandru I. Mitrea	
e-mail	Alexandru.Ioan.Mitrea@math.utcluj.ro	

Areas of expertise

LC MoDef research laboratory is devoted to the development of the mathematical basis of the theory of deformable models and to the applications of this theory in image processing and medical imaging, involving the following areas of expertise:

- Differential Equations
- Calculus of Variations
- Geometry
- Numerical Analysis
- Probabilities
- Modelling & Simulation
- Medical Imaging (Ultrasonography, CT, MRI)
- Digitization based on mathematical models applied in the medical field

Team

Prof. Dr. Math. Alexandru I. Mitrea; Prof. Dr. Math. Dumitru Mircea Ivan; Assoc. Prof. Dr. Math. Daniela Inoan; Assoc. Prof. Dr. Math. Radu Peter, Senior Lect. Dr. Mircea Gurzau

Representative projects

MoDef, “Modelling using advanced methods and techniques based on the theory of deformable surfaces with applications in computer assisted surgery and other modelling procedures of anatomic structures”, PN II 11018-Partnership, <http://dicomge.utcluj.ro/modef> (2007-2010)

Advanced Methods and Algorithms of Mathematics related to the Theory of Deformable Models, with applications in image processing and medicine, Grant CNCSIS 1255, 2006-2008

Significant results

The most representative publications of the past 5 years:

1. Mitrea Alexandru Ioan, Remarks on using some Finite Difference Schemes to provide energy minimizing snakes, The 16-th International Conference on Applied Mathematics and Computer Science, July 3-6, 2019
2. Mitrea, Alexandru I., On the dense unbounded divergence of interpolatory product integration on Jacobi nodes CALCOLO Volume: 55 Issue: 1 Article Number: UNSP 10 Published: MAR 2018
3. Peter, Ioan Radu, A Bound of the Finslerian Ricci Scalar MEDITERRANEAN JOURNAL OF MATHEMATICS Volume: 15 Issue: 3 Article Number: 143 Published: JUN 2018

4. Inoan, Daniela Ioana; Kolumban, Jzsef, Existence Theorems for Inequality Systems BULLETIN OF THE IRANIAN MATHEMATICAL SOCIETY Volume: 44 Issue: 5 Pages: 1329-1336 Published: OCT 2018
5. Inoan, D.; Kolumban, J., Existence theorems via duality for equilibrium problems with trifunctions OPTIMIZATION Volume: 67 Issue: 5 Pages: 537-547 Published: 2018
6. Inoan, D.; Kolumban, J., On Quasi-Equilibrium Problems with Trifunctions MINIMAX THEORY AND ITS APPLICATIONS Volume: 3 Issue: 1 Pages: 161-172 Published: 2018
7. Inoan, Daniela, Variational relations problems via fixed points of contraction mappings JOURNAL OF FIXED POINT THEORY AND APPLICATIONS Volume: 19 Issue: 2 Pages: 1571-1580 Published: JUN 2017
8. Anastasiei, Mihai; Kozma, Laszlo; Peter, Ioan Radu, Some applications of index form in Finsler geometry PUBLICATIONES MATHEMATICAE-DEBRECEN Volume: 90 Issue: 3-4 Pages: 455-469 Published: 2017
9. Mitrea, Alexandru I., On the dense divergence of the product quadrature formulas of interpolatory type JOURNAL OF MATHEMATICAL ANALYSIS AND APPLICATIONS Volume: 433 Issue: 2 Pages: 1409-1414 Published: JAN 15 2016
10. I. R. Peter and C. Pinte, "Necessary Conditions for Finite Critical Sets. Maps with Infinite Critical Sets", *Topological Methods in Nonlinear Analysis*, vol. 47, pp. 739-749, Jun 2016.
11. D. Marian, I. R. Peter, and C. Pinte, "Operations with monotone operators and the monotonicity of the resulting operators," *Monatshefte Fur Mathematik*, vol. 181, pp. 143-168, Sep 2016.
12. A.I Mitrea, S.Nedevschi, D. Mitrea, P. Mitrea, R. Badea: "Diseased Tissue Area Detection and Delimitation, by Fusion between Finite Difference Methods and Textural Analysis", *IEEE International Conference on Automation, Quality and Testing, Robotics 2014*, pp.305-310.
13. Ioana Chifor, Alexandru I. Mitrea, Iulia Clara Badea, Radu Chifor, Mindra Eugenia Badea, Paulina Mitrea, Sever Popa, Maria Crisan, Ramona Avram, "Mathematical Methods for Assessing the Prognostic of Fixed Partial Dentures Resulting from Evaluating a Group of Dental Patients in Romania", *Computational and Mathematical Methods in Medicine*, Volume 2014 (2014), Article ID 984901, 11 pages
14. A. I. Mitrea: "On the dense unbounded divergence of the discrete best approximation", *Taiwanese Journal of Mathematics*, vol.18, no.4(2014), 1119-1127, DOI:10.11650/tjm.18.2014.3743

Significant solutions:

Considering until now parametric (variational) deformable models, we developed an iterative method based on finite difference schemes in order to solve numerically the ELP equation of Calculus of Variations, which provides the energy minimizing snake; we derived estimates concerning the approximation error related to the corresponding ELP algorithm and we established conditions for its convergence and stability; as future targets, we intend to consider probabilistic models which offer an alternative approach by using the Bayes technique, as well as geometric deformable models which provide an efficient alternative to address some limitation of parametric deformable models.

Products and technologies:

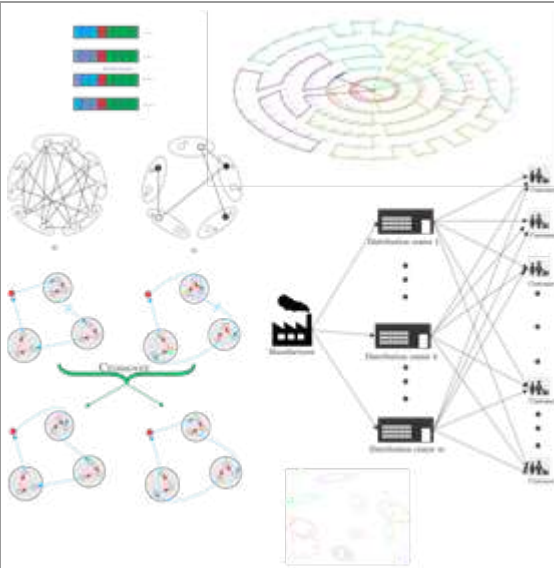
1. Mathematical study concerning the deformable model theory: energy functional, evolution equation, discretization methods
2. Stochastic Modelling and Simulation Platform/Implemented in Java/
3. 3D Deformable Surfaces Modelling Software Environment

The offer addressed to the economic environment

Research & development	Generating performing mathematical algorithms in order to obtain the minimizing-energy curves and surfaces. Finding approximation error, convergence rate and giving consistency and stability conditions concerning these algorithms .
Consulting	Consulting in finding suitable algorithms to obtain minimizing-energy curves and surfaces, which assist activities in medicine, industrial environments, modern traffic infrastructure, physics
Training	Deformable models theory: reveal of the interdisciplinary value of the domain, connections with practical problems of medicine, image processing, and physics; knowledge confluence from functional analysis, approximation theory, differential equations, differential geometry, calculus of variations, numerical analysis, linear algebra, and probability theory. Model-based approach: integrating computer-assisted medical image analysis, their applications at this level including image segmentation, shape representation and motion tracking.

INTELLIGENT METHODS FOR SOLVING OPTIMIZATION PROBLEMS

Contact details

Name	Intelligent Methods for Solving Optimization Problems	
Acronym	sIMONE	
Logo		
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Matematica-Informatica/1_Pop-Sitar.pdf	
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Fax	+40 026 2275368	
Director	Prof. Dr. Petrica Pop Sitar	
e-mail	petrica.pop@ubm.ro	

Areas of expertise

Combinatorial Optimization

- Complexity aspects; Mathematical modelling; Exact approximation, heuristic and hybrid algorithms; Relaxation techniques

Metaheuristic Algorithms

- Genetic algorithms; Ant colony optimization; Variable neighborhood search; Memetic algorithms; Hybrid algorithms

Team

Prof. Dr. Petrica Pop Sitar, Prof. Dr. Oliviu Matei, Assoc. Prof. Dr. Corina Pop Sitar, Assoc. Prof. Dr. Andrei Horvat Marc, Assoc. Prof. Dr. Ovidiu Cosma, Assoc. Prof. Dr. Camelia Pinte, Assoc. Prof. Dr. Ioana Zelina, Lecturer Dr. Cosmin Sabo, Lecturer. Dr. Mara Hajdu- Macelaru

Representative projects

“Collaborative Environment for Design of Aml enhanced Product-Services Integrating Highly Personalized Innovative Functions with Minimal Ecological Footprint along Life Cycle and of their Production “, ProSeCo, European FP7 project, <http://proseco-project.eu/> (2013-2017)

“New hybrid metaheuristic methods for solving network design problems”, PN-II-RU-TE-2011-3-0113, www.cunbm.utcluj.ro/meta-hibrid, 2011-2014.

“Hybrid Bi-level Optimization Approaches for Generalized Network Design Problems”, bilateral project Romania – Austria, 2014-2015

“Selective graph coloring problem”, grant PHC Bosphore 26284RB, EGIDE, 2012-2013.

“Research, development and implementation of organizing the documents”, ANCS, 2010-2013.

“Algorithmical methods for solving combinatorial optimization problems”, project CEEX, ET34, 2006-2008, <http://ceex-et34.ubm.ro>

Significant results

The most representative publications of the past 5 years:

1. P.C. Pop, The generalized minimum spanning tree problem: an overview of formulations, solution procedures and latest advances, European Journal of Operational Research, (I.F.=3.806), Vol. 283(1), pp. 1-15, 2020.
2. O. Cosma, D. Danculescu and P.C. Pop, On the two-stage transportation problem with fixed charge for opening the distribution centers, (I.F.=4.098), IEEE Access, Vol. 7(1), pp. 113684-113698, 2019.
3. Pinte, C.-M., Calinescu, A., Pop Sitar, C., Pop, P.C., Towards secure & green two-stage supply chain networks, Logic Journal of the IGPL, (I.F.=0.609), Vol. 27(2), pp. 137-148, 2019.

4. O. Cosma, P.C. Pop and C. Pop Sitar, An efficient iterated local search heuristic algorithm for the two-stage fixed-charge transportation problem, *Carpathian Journal of Mathematics*, (I.F.=0.488), Vol. 35(2), pp. 153-164, 2019.
5. Pop, Petrica C.; Matei, Oliviu; Sabo, Cosmin; et al., A two-level solution approach for solving the generalized minimum spanning tree problem *EUROPEAN JOURNAL OF OPERATIONAL RESEARCH* Volume: 265 Issue: 2 Pages: 478-487 Published: MAR 1 2018.
6. P.C. Pop, L. Fuksz, A. Horvat Marc and C. Sabo, A novel two-level optimization approach for clustered vehicle routing problem, *Computers & Industrial Engineering*, (I.F.=3.518), Vol. 115, pp. 304-318, 2018.
7. A. Horvat Marc, L. Fuksz, P.C. Pop and D. Danciulescu, A decomposition-based method for solving the Clustered Vehicle Routing Problem, *Logic Journal of IGPL*, Vol. 26(1), pp. 83-95, 2018.
8. P.C. Pop, C. Sabo, B. Biesinger, B. Hu and G. Raidl, Solving the Two-Stage Fixed-Charge Transportation Problem with a Hybrid Genetic Algorithm, *Carpathian Journal of Mathematics* (I.F.=0.788), Vol. 33, No. 3, pp. 365-371, 2017.
9. J. Suto, S. Oniga and P.C. Pop, Feature analysis to human activity recognition, *International Journal of Computers, Communications & Control*, Vol. 12, No. 1, pp. 116-130, 2017.
10. Pintea, Camelia-M.; Matei, Oliviu; Ramadan, Rabie A.; et al., A Fuzzy Approach of Sensitivity for Multiple Colonies on Ant Colony Optimization Conference: 7th International Workshop on Soft Computing Applications (SOFA) Location: Arad, ROMANIA Date: AUG 24-26, 2016 , *SOFT COMPUTING APPLICATIONS, SOFA 2016, VOL 2* Book Series: Advances in Intelligent Systems and Computing Volume: 634 Pages: 87-95 Published: 2018
11. Chiver, Olivian; Neamt, Liviu; Matei, Oliviu; et al., Utilization of Finite Elements Programs and Matlab Simulink in the Study of a Special Electrical Motor *INTERNATIONAL JOURNAL OF ADVANCED COMPUTER SCIENCE AND APPLICATIONS* Volume: 8 Issue: 4 Pages: 317-323 Published: APR 2017
12. Matei, Oliviu; Rusu, Teodor; Bozga, Andrei; et al., Context-Aware Data Mining: Embedding External Data Sources in a Machine Learning Process Conference: 12th International Conference on Hybrid Artificial Intelligent Systems (HAIS) Location: Logrono, SPAIN Date: JUN 21-23, 2017 *HYBRID ARTIFICIAL INTELLIGENT SYSTEMS, HAIS 2017* Book Series: Lecture Notes in Artificial Intelligence Volume: 10334 Pages: 415-426 Published: 2017
13. O. Matei, D. Contrás, P.C. Pop and H. Valean, Design and Comparison of Two Evolutionary Approaches for Automated Product Design, *Soft Computing*, Vol. 20, Issue 11, pp 4257-4269, 2016.
14. P. Pop, O. Matei, C. P. Sitar, and I. Zelina, "A hybrid based genetic algorithm for solving a capacitated fixed-charge transportation problem", *Carpathian Journal of Mathematics*, vol. 32, pp. 225-232, 2016.
15. S. Jozsef, S. Oniga, P. Pop - Sitar, "Comparison of Wrapper and Filter Feature Selection Algorithms on Human Activity Recognition", 2016 *6TH INTERNATIONAL CONFERENCE ON COMPUTERS COMMUNICATIONS AND CONTROL (ICCCC)*, Oradea, ROMANIA, pp.124-129, 2016
16. S. Fidanova and P.C. Pop, "An improved hybrid ant-local search search for the partition graph coloring problem", *Journal of Computational and Applied Mathematics*, Vol. 293, pp. 55-61, doi: 10.1016/j.cam.2015.04.030, Elsevier, 2016.
17. P.C. Pop, C.M. Pintea, C. Pop Sitar and M. Hajdu-Macelar, "An efficient reverse distribution system for solving a supply chain network design problem", *Journal of Applied Logic*, Elsevier, Vol. 13(2), Part A, pp. 105-113, 2015.
18. C.M. Pintea, P.C. Pop and I. Zelina, "Denial jamming attacks on wireless sensor network using sensitive agents", *Logic Journal of IJPL*, doi: 10.1093/jigpal/jzv046, Oxford University Press, in Press.
19. C.M. Pintea and P.C. Pop, "An improved hybrid algorithm for capacitated fixed-charge transportation problem", *Logic Journal of IJPL*, doi: 10.1093/jigpal/jzv014, Oxford University Press, Vol. 23(3), pp. 369-378, 2015.
20. O. Matei, P.C. Pop, I. Sas and C. Chira, "An improved immigration memetic algorithm for solving the heterogeneous fixed fleet vehicle routing problem", *Neurocomputing, Elsevier*, Vol. 150, Part A, pp. 58-66, 2015.

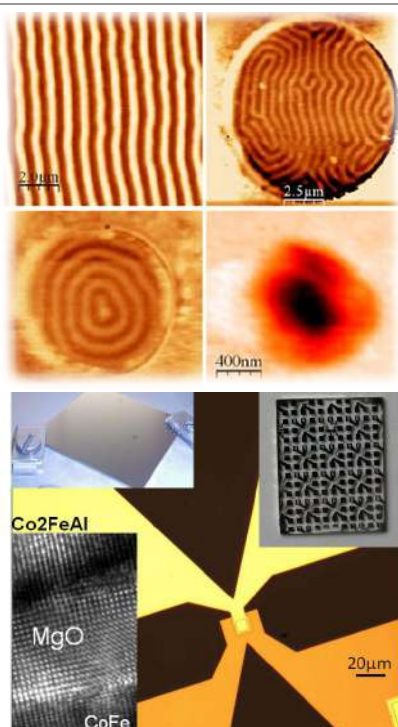
The offer addressed to the economic environment

Research & development in core areas	Elaboration of new intelligent methods for solving complex optimization problems. Development of new nature inspired algorithms based on group intelligence, extension and improving the existent methods and hybridizing the metaheuristic algorithms with exact methods based on integer programming.
Research & development in applied fields	Proposal of new intelligent methods for solving complex optimization problems such as network design problems, facility and location problems, transportation problems, scheduling problems, etc. Document and information flows, indexing of documents, knowledge organization, real time applications.
Consulting	The research team has the necessary abilities for providing the necessary consulting activities to the beneficiaries for implementing the research results in the proposed field of research. These abilities are confirmed by the previously obtained results.

CENTER OF SUPERCONDUCTIVITY, SPINTRONICS AND SURFACE SCIENCE

Contact details

Name	Center of Superconductivity, Spintronics and Surface Science
Acronym	C4S
Logo	
Site	http://www.c4s.utcluj.ro/
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Director	Prof. Dr. Phys. Traian Petrisor
e-mail	traian.petrisor@phys.utcluj.ro



Areas of expertise

SUPERCONDUCTIVITY: new materials and technologies for coated conductors based on YBa₂Cu₃O_{7-y} (YBCO) fabrication using the Rolling-Assisted-Biaxially-Textured-Substrates approach. Applied research and development efforts include Ni-based biaxially textured tapes processing, deposition of both oxide buffer layers and YBCO films by chemical solution deposition (CSD). **Responsible/contact:** traian.petrisor@phys.utcluj.ro

SPINTRONICS: manipulation of the electron spin in electronic devices. Elaboration and study of new materials, magnetic and nonmagnetic thin film systems, the design and the patterning of individual spintronic devices for applications in the field of sensors, data storage and logic element, fundamental physics, theoretical modeling. **Responsible/contact:** coriolan.tiusan@phys.utcluj.ro

SURFACE SCIENCE. The molecular dynamics at the interface or under confinement conditions inside porous media is investigated using the noninvasive Nuclear Magnetic Resonance (NMR) technique based on diffusometry and relaxometry. The studied samples are: polymeric nano and micro-capsules used as drug carriers, ultra strong concrete, liquids confined inside porous ceramics with controlled amount of magnetic impurities, polymers, liquid crystals, binary mixtures of fluids, ionic liquids, etc. **Responsible/contact:** ioan.ardelean@phys.utcluj.ro

MATERIALS CHEMISTRY. Within this topic the following axes are developed: precursors (synthesis, characterization, single crystal growth, molecular modeling), thin films, nanoparticles and nanostructuring. Using chemical preparation methods (sol-gel) different thin oxide films with a large range of applications in electronics, optics, catalysis, wear resistance, corrosion protection and superconductivity are prepared: La_{0.66}Sr_{0.33}MnO₃, La₂Zr₂O₇, YBa₂Cu₃O₇, BaZrO₃. Resent research axis concerns nano-lithography using self-assembled polymer templates. **Responsible/contact:** lelia.ciontea@chem.utcluj.ro

Team

Prof. Dr. Phys. Traian Petrisor, Prof. Dr. Lelia Ciontea, Prof. Dr. Coriolan Tiusan, Prof. Dr. Ioan Ardelean, Assoc. Prof. Dr. Gavril Negrea, Assoc. Prof. Dr. Tania Ristoiu, Assist. Prof. Dr. Amalia Mesaros, Assist. Prof. Dr. Phys. Traian Petrisor Jr, Assist. Mihai Gabor, Tech. Razvan Miclea, Res. Assist. Bianca Mos, Res. Assist. Mircea Nasui.

Representative projects

ExNanoMat Supporting excellence in nanotechnology and advanced materials research, PNIII-P1-1.2- 1.2.2 PFE, (2018-2020)

EMERSPIN – “Emerging sensors and data storage spintronic devices based on magnetic tunnel junctions with enhanced efficiency magnetization manipulation” PN-III-P4-ID-PCE-2016-0143, (2017-2019), <https://c4s.utcluj.ro/Current%20projects%20-PNIII-ID22-2017.html>

EUROTAPES - “European development of Superconducting Tapes: integrating novel materials and architectures into cost effective processes for power applications and magnets”, FP6, (2012-2016)

“Unexplored magnetic vortex regimes relevant for fusion applications of superconductors.” FP7 - EUROFUSION

Eneabling Project

SPINCOD- "Advanced spintronic devices for communication and data storage technologies based on Heusler compounds" PN-II-RU-TE-2014-4-1820 – SPINCOD (2015-2017)

MAGPIN-"Nano-engineered Magnetic Pinning Centers in High Temperature Superconducting Epitaxial Thin Films", PN-II-RU-TE-2014-4-2848 MAGPIN (2015-2017)

SPINTAIL-"Dispozitive spintronice mezoscopice cu proprietati magnetice si de transport controlate", PN-II-ID-PCE, IDEI (2013-2016)

SPINTRONIC- "Cercetarea si dezvoltarea de dispozitive spintronice la scara mezoscopica", POS-CCE, (2010-2013)

"Efectele dopajului si ale dimensionalitatii asupra proprietatilor magnetice, structurale si morfologice si dinamicii de spin in micro si nanostructuri oxidice feromagnetice", PNI-ID, (2010-2013)

"Nuclear magnetic resonance studies of surface effects on dynamics of molecules confined inside porous media with magnetic impurities", PNII PCE-IDEI, (2011-2016)

Significant results

The most representative publications of the past 5 years:

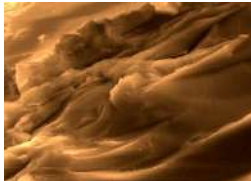
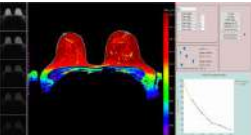
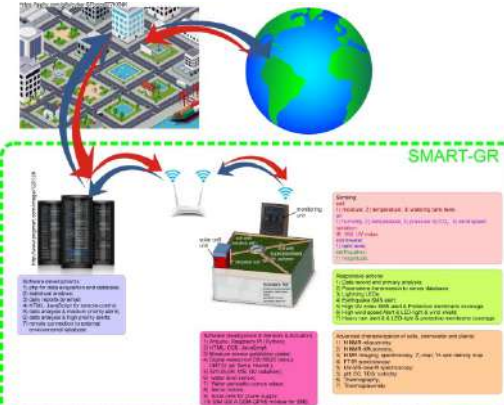
1. Belmeguenai, M.; Roussigne, Y.; Cherif, S. M.; et al., Influence of the capping layer material on the interfacial Dzyaloshinskii-Moriya interaction in Pt/Co/capping layer structures probed by Brillouin light scattering JOURNAL OF PHYSICS D-APPLIED PHYSICS Volume: 52 Issue: 12 Article Number: 125002 Published: MAR 20 2019
2. M Bersweiler, K Dumesnil, Y Fagot-Revurat, P Le Fèvre, C Tiusan, D Lacour and M Hehn, Spin-polarized resonant surface state in (111) $\text{Sm}_{1-x}\text{Gd}_x\text{Al}_2$, a zero-magnetization ferromagnet JOURNAL OF PHYSICS-CONDENSED MATTER Volume: 30 Issue: 43 Article Number: 435501 Published: OCT 31 2018
3. M Belmeguenai, K Aitoukaci, F Zighem, MS Gabor, T Petrisor Jr, RB Mos, C Tiusan, Investigation of the annealing temperature dependence of the spin pumping in $\text{Co}_{20}\text{Fe}_{60}\text{B}_{20}/\text{Pt}$ systems, Journal of Applied Physics 123 (11), 113905 (2018), DOI: <https://doi.org/10.1063/1.5011111>
4. M. Belmeguenai, M. S. Gabor, F. Zighem, D. Berling, Y. Roussigne, T. Petrisor, et al., "Static and dynamic magnetic properties of Co_2FeAl -based stripe arrays", *Journal of Magnetism and Magnetic Materials*, vol. 399, pp. 199-206, Feb 2016.
5. M. S. Gabor, T. Petrisor, R. B. Mos, A. Mesaros, M. Nasui, M. Belmeguenai, et al., "Spin-orbit torques and magnetization switching in $\text{W}/\text{Co}_2\text{FeAl}/\text{MgO}$ structures", *Journal of Physics D-Applied Physics*, vol. 49, Sep 2016.
6. MS Gabor, M Belmeguenai, T Petrisor Jr, C Ulhaq-Bouillet, S Colis, C Tiusan, "Correlations between structural, electronic transport, and magnetic properties of Co_2FeAl 0.5 Si 0.5 Heusler alloy epitaxial thin films", *Physical Review B* 92 (5), 054433, 2015;
7. R. B. Mos, M. Nasui, T. Petrisor Jr., M. S. Gabor, R. A. Varga, L. Ciontea, "Synthesis, crystal structure and thermal decomposition of $\text{Zr}_6\text{O}_4(\text{OH})_4(\text{CH}_3\text{CH}_2\text{COO})_{12}$ ", in *J of Analytical and Appl. Pyrolysis*, vol. 97, 2012, pp. 137-142;
8. M. Nasui, T. Petrisor. Jr, R.B. Mos, M.S. Gabor, A. Mesaros, F. Goga, L. Ciontea, T. Petrisor, "Fluorine-free propionate route for the chemical solution deposition of $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ superconducting films", *Ceramic International* 41, 2015, pp. 4416-4421;

The offer addressed to the economic environment

Research & development	Superconductivity and materials chemistry The C4S is developing new materials and technologies for coated conductors using the Rolling-Assisted-Biaxially-Textured-Substrates (RABiTS) approach. Applied research and development efforts include Ni-based biaxially textured tapes processing, deposition of both oxide buffer layers and YBCO films by chemical solution deposition (CSD). Spintronics, dealing with the development of sensors and data storage devices based on giant - and tunnelling magneto-resistance systems. We are dealing with the design and the patterning of individual spintronic devices for applications in the field of sensors, data storage, logic elements, high frequency oscillators. Future research axes concern the superconducting spintronics which combines classical spintronics and superconductivity, the spin-orbitronics and the spintronics with graphene. Surface Science The NMR laboratory is designed to study molecular dynamics at the interface or under confinement conditions inside porous media; The systems under study are: polymeric nano and micro-capsules used as drug carriers, ultra strong concrete samples, liquids confined inside porous ceramics with controlled amount of magnetic impurities, polymers, liquid crystals, binary mixtures of fluids, ionic liquids, etc.
Consulting	Available for consulting within the following areas: materials science, low temperature systems, thin film elaboration and characterization tools (structural, morphological, magnetic properties), patterning using UV lithography techniques and ion beam/chemical etching, clean room facilities, high vacuum and Ultra High Vacuum deposition tools, chemical elaboration strategies for thin films and nanoparticles, molecular dynamics at the interface or under confinement conditions inside porous media via the non-invasive Nuclear Magnetic Resonance (NMR) technique.
Training	- Participating to high level teaching modules (e.g. master degree): module of nanotechnology and advanced materials. - Participating of C4S members at teaching activities within the TUCN (elementary physics and chemistry classes).

RESEARCH CENTER FOR ADVANCED MATERIALS AND ENVIRONMENTAL PHYSICS AND CHEMISTRY

Contact details

Name	Research Center for Advanced Materials and Environmental Physics and Chemistry		
Acronym	CCFCMAM		
Logo			
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Fizica/2_Culea.pdf		
Address	103-105 Muncii Blv., 400641 Cluj-Napoca, Romania		
Faculty Department	Faculty of Materials Engineering and Environmental Engineering Physics and Chemistry Department		
Telephone	+40 264 401262, +40 741111149, +40 741770595		
Fax	+40 264 595355		
Honorary Director	Prof. Dr. Phys. Eugen Culea		
e-mail	eugen.culea@phys.utcluj.ro		
Executive Director	Prof. Dr. Habil. Phys. Radu Fechete		
email	rfechete@phys.utcluj.ro		

Areas of expertise

Laboratory of Nuclear Magnetic Resonance and Sensors' Physics (<https://nmr4.utcluj.ro/>; <https://erris.gov.ro/Laboratory-of-Nuclear-Magnet>)

- **Structural and dynamic characterization of materials** (elastomers, various polymers, bio-materials, micro-, nano-hydrogels, PEM membranes, cosmetic materials, construction materials, etc) by measurement of: 1) relaxation times (T_1 , T_2 , $T_{1\rho}$) and relaxation times distributions; 2) self-diffusion coefficient; 3) dipolar correlation function (MQ); 4) 2D T_1 - T_2 , D - T_1 , D - T_2 correlation maps and T_2 - T_2 exchange maps;
- **On-line and off line environmental monitoring**: development of monitoring platforms; detection and measurement of some pollutants spectroscopic methods (IR, UV-Vis, EPR, NMR), sonometry, photometry, specific sensors;
- **Medical Physics**: *In vivo* MRI, MRs and fMRI measurements and *in vitro* biological tissue characterization.
- **Numeric Analysis and Numeric Modeling**: Data processing (Image, spectroscopic), Data analysis and interpretation; Statistic analysis (PCA), Molecular Modeling; Spectroscopic modeling (FT-IR, ^1H and ^{13}C NMR).

X-Ray Diffraction, TG/DTA and Spectroscopy Laboratory

- **Structural characterization of materials**: X-ray diffraction and spectroscopic methods (IR, UV-Vis, EPR) are used to realize the structural characterization of materials (glasses, ceramics, metals, etc.).
- **Characterization of physico-chemical properties of materials**: Spectroscopic (IR, UV-Vis, EPR), thermal (TG/DTA) and magnetic investigation methods are used to characterize the physico-chemical properties of materials.

Laboratory of Computational modelling of molecular structures of materials

- Based on spectroscopic experimental data obtained for different materials their molecular structure is achieved by using computational modelling.

Team

Prof. Dr. Phys. Culea Eugen, Prof. Dr. Radu Fechete, Assoc. Prof. Dr. Petru Pășcuța, Assoc. Prof. Dr. Simona Rada, Prof. Dr. Phys. Dan E. Demco, Prof. Dr. Chem. Elena Maria Pică, Lecturer Dr. Pop Lidia Pop, Lecturer Dr. Liviu Bolunduț, Lecturer Dr. Maria Boșca, Lecturer Dr. Ramona Chelcea, Lecturer Dr. Dumitrița Moldovan.
Phd students: Phys. Iris Adina Morar; Master Students: Ing. Ramona Crainic, Ing. Lavinia Drăgan.

Representative projects

"Structure-dynamics-properties relations and aging effects in nanocomposite elastomers and proton exchange membranes", (2011-2016):
PN-II-ID-PCE-2011-3-0544; http://www.phys.utcluj.ro/resurse/Cercetare/PNII_ID_307_2011.html;
"New nanostructured vitreous systems with possible application in the immobilization of nuclear wastes", (2009-

2011), PNII-Idei-183/2009:

https://phys.utcluj.ro/resurse/Cercetare/PNII_ID_183_2009_Eng.htm

"Obtaining and characterization of physical and structural properties of some new glasses and glass ceramics doped with 3d and 4f ions with possible applications in electronics and telecommunication", (2009-2011)

PNII-IDEI-532/ 2009, https://phys.utcluj.ro/resurse/Cercetare/PNII_ID_532_2009_Eng.htm

"New tellurate and germanate vitreous systems with applications in telecommunications", (2007-2010):

Parteneriate, https://phys.utcluj.ro/resurse/Cercetare/CNMP_71099_2007.html

MATNANTECH - "Clustering processes in oxide vitreous systems with 4f ions", (2006-2009)

CEEX 47/2006, http://www.phys.utcluj.ro/resurse/Cercetare/CEEX_47_2006.html.

"Nanostructured phases in vitreous systems with 4f ions",

CEEX POSTDOC 1546/2006, http://www.phys.utcluj.ro/resurse/Cercetare/CEEX_1546_2006.html (2006-2009).

Significant results

The most representative publications of the past 5 years:

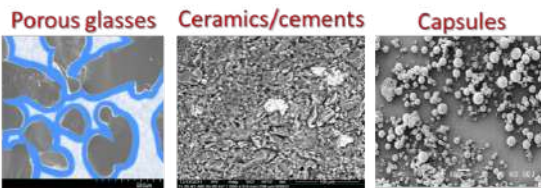
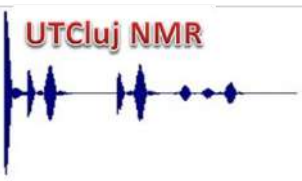
1. K. H. Tan, D. E. Demco, R. Fechete, A. Pich, Functional selenium modified microgels: temperature-induced phase transitions and network morphology, *Soft matter*, 15 (15), 3227-3240 (2019).
2. M. Rada, A. Popa, S. Rada, A. Bot, E. Culea, Recycled and vanadium-doped materials as negative electrode of the lead acid battery, *J. Sol.State Electrochem.*, 23(17) (2019).
3. S. Rada, E. Culea, M. Rada, Microstructure and mechanical properties of stabilized zirconia ceramics, *Dental Materials*, 35 32, (2019).
4. R. E. David, R. Fechete, S. Sfrangeu, D. Moldovan, R. I. Chelcea, I. A. Morar, F. Stamatian, T. Kovacs, P. Popoi, *In Vivo* ¹H Nuclear Magnetic Resonance Spectroscopy and Relaxometry Maps of the Human Female Pelvis, *Analytical Letters*, 52 (1) 54-77 (2019);
5. P. Pășcuță, L. Pop, R. Stefan, L. Olar, G. Borodi, L. C. Bolundut, E. Culea, The impact of Ag and Cu nanoparticles on optical and magnetic properties of new Tb₂O₃-PbO-TeO₂ glass ceramic system, *Journal of Alloys and Compounds*, 799, 442 (2019).
6. S. Rada, M. L. Unguresan, M. Rada, D. Cuibus, J. Zhang, .Pengfei, R. Suci, A. Bot, E. Culea, Manganese-Lead-Lead Dioxide Glass Ceramics as Electrode Materials, *J. Electrochem.Soc.*, 166(16): A3987-A3996, (2019).
7. L. Pop, L. Bolundut, P. Pășcuță, E. Culea, Influence of Er³⁺ ions addition on thermal and optical properties of phosphate-germanate system, *Journal of Thermal Analysis and Calorimetry*, 138, 1895 (2019).
8. R. Ștefan, L. C. Bolundut, L. Pop, G. Borodi, E. Culea, P. Pășcuță, Copper nanoparticles enhanced luminescence of Eu³⁺ doped lead tellurite glass ceramics, *Journal of Non-Crystalline Solids*, 505, 9 (2019).
9. S. Rada, D. Cuibus, H. Vermesan, M. Rada, E. Culea, Structural and electrochemical properties of recycled active electrodes from spent lead acid battery and modified with different manganese dioxide contents, *Electrochem. Acta*, 332-339 (268) (2018).
10. R. Ștefan, M. Karabulut, A. Popa, E. Culea, L. Bolundut, L. Olar, P. Pășcuță, A spectroscopic study of the influence of CuO addition on the ZnO-TeO₂ glass and glass ceramics, *Journal of Non-Crystalline Solids*, 498, 430 (2018).
11. S. Schweizerhof, D. E. Demco, A. Mourran, R. Fechete, M. Moeller, Diffusion of Gold Nanorods Functionalized with Thermoresponsive Polymer Brushes, *Langmuir*, 34, 8031-8041 (2018).
12. L. Bolundut, L. Pop, M. Bosca, G. Borodi, L. Olar, R. Suci, P. Pășcuță, E. Culea, R. Stefan, Structural and spectroscopic properties of some neodymium-boro-germanate glasses and glass ceramics embedded with silver nanoparticles, *Ceramics International*, 43, 12232 (2017).
13. L. Bolundut, L. Pop, M. Bosca, N. Tothazan, G. Borodi, E. Culea, P. Pășcuță, R. Stefan, Structural, spectroscopic and magnetic properties of Nd³⁺-doped lead tellurite glass ceramics containing silver, *Journal of Alloys and Compounds*, 692, 934 (2017).
14. S. Singh, D. E. Demco, K. Rahimi, R. Fechete, J. C. Rodriguez-Cabello, and M. Moller, "Aggregation behaviour of biohybrid microgels from elastin-like recombinamers", *Soft Matter*, vol. 12, pp. 6240-6252, (2016).
15. R. S. Sipos, R. Fechete, D. Moldovan, I. Sus, Z. Pavai, and D. E. Demco, "Ovariectomy-Induced Osteoporosis Evaluated by ¹H: One- and Two-Dimensional NMR Transverse Relaxometry", *Applied Magnetic Resonance*, 47, 1419-1437, (2016).

The offer addressed to the economic environment

Research & development	Characterization of structural and behavioural properties of materials by using spectrometric and magnetic analysis investigation methods. Design of advanced models for materials structure based on spectroscopic data and computational modeling.
Consulting	Consulting in: - spectroscopic and spectrometric analysis methods (1D and 2D ¹ H NMR relaxometry and diffusiometry, X-ray diffraction, FT-IR, UV-Vis, EPR); - environmental monitoring (sensors/actuators, monitoring platforms, database, data processing, data analysis, sonometry and photometry); - thermography and thermogravimetry ; - magnetic measurements .
Training	Training in using different spectroscopic and spectrometric analysis methods (IR, UV-Vis, EPR, NMR, Thermography), magnetic measurements, sonometry and photometry.

NUCLEAR MAGNETIC RESONANCE DIFFUSOMETRY AND RELAXOMETRY LABORATORY

Contact details

Name	Nuclear Magnetic Resonance Diffusometry and Relaxometry Laboratory	  
Acronym	NMRDR	
Logo		
Site	http://nmr.utcluj.ro	
Address	103-105 Bulevardul Muncii, room C001, Cluj-Napoca, Romania	
Faculty Department	Faculty of Materials and Environmental Engineering Physics and Chemistry Department	
Telephone	+40 264 401262	
Fax	+40 264 595355	
Director	Prof. Dr. Ioan Ardelean	
e-mail	ioan.ardelean@phys.utcluj.ro	

Areas of expertise

In our laboratory we investigate via NMR diffusometry and relaxometry techniques the dynamics of liquid molecules at the interface of porous media and under confinement conditions. The porous media under study have nanometer or micrometer pore sizes and may be fully or partially saturated with fluids. The investigations can be done at different temperatures and resonance frequencies.

The porous systems currently under study are: porous glasses, colloidal crystals, polymeric nanocapsules used in controlled drug delivery, cement-based materials, bone cements, porous ceramics with magnetic impurities, biomaterials with applications in medicine, magnetic nanoparticles used as contrast agents in magnetic resonance imaging.

Other materials which can be studied in our laboratory are: woods, fuel cell membranes, lubricants, fuels, catalysts, zeolites, ionic liquids, liquid crystals, rubber. Using NMR relaxometry and diffusometry techniques in the investigation of fluids confined inside porous media it is possible to extract information about pores dimension and their connectivity.

Other information that can be extracted refers to the ageing and alteration processes of different materials such as rubber, polymers, lubricants or food. In our laboratory we are also interested in developing of new NMR techniques suitable for the investigation of systems with a high content of magnetic impurities (concrete, rocks, soils, different building materials).

Team

Prof. Dr. Ioan Ardelean, Assist. Prof. Dr. Codruța Badea, Ioana Lacan, Alexandru Simedru

Representative projects

CONFLEX - "Developing and testing of a new concrete, with higher flexural strength, obtained through the addition of nanoparticles and organosilane", PN-III-P2-2.1-PED-2016-0719, (2017-2018), <https://ped125.weebly.com/>

"Nuclear magnetic resonance studies of surface effects on dynamics of molecules confined inside porous media with magnetic impurities", PN-II-ID-PCE-2011-3-0238, <https://idei305.weebly.com/> (2011-2016)

"Molecular dynamics during the phase transition of liquids confined inside porous media", Alexander von Humboldt foundation, INSTITUTSPARTNERSCHAFT UTCN-Universitatea Tehnică Ilmenau, Germania (2011-2014)

"NMR studies of molecular dynamics inside polymeric nanocapsules", CEEX MATNANTECH (2006-2008)

"Obtaining and characterization of new target nano-medicines with naftochinonic active substance", PN2-NANOQMED (2007-2010)

Significant results

The most representative publications of the past 5 years:

1. I. Ardelean, R. Kimmich, "Beyond the Limits of Conventional Pulsed Gradient Spin Echo (PGSE) Diffusometry: Generalization of the Magnetization-grating Principle", in "Diffusion NMR of Confined Systems: Fluid Transport in Porous Solids and Heterogeneous Materials"; Edited by Royal Society of Chemistry 2016; pag. 260-293; DOI:10.1039/9781782623779
2. I. Ardelean, "Applications of Field-cycling NMR Relaxometry to Cement Materials", in "Field-Cycling NMR Relaxometry: Instrumentation, Model Theories and Applications", Edited by Royal Society of Chemistry 2018; pag. 462 – 489; <http://dx.doi.org/10.1039/9781788012966>
3. S. Boboia, M. Moldovan, C. Prejmerean, C. Sarosi, A. Roman, I. Ardelean, Influence of Initiation System and Filler Ratio on the Properties of New Flowable Dental Composites, *Materiale Plastice* 52, 104-108 (2015).
4. A. Pop and I. Ardelean, Monitoring the size evolution of capillary pores in cement paste during the early hydration via diffusion in internal gradients, *Cem. Conc. Res.* 77, 76-81 (2015).
5. A. Pop, A. Bede, M.C. Dulescu, F. Popa, I. Ardelean, Monitoring the Influence of Aminosilane on Cement Hydration Via Low-field NMR Relaxometry, *Appl. Magn. Reson.* 47, 191–199 (2015).
6. A. Bede, A. Scurtu, I. Ardelean, NMR relaxation of molecules confined inside the cement paste pores under partially saturated conditions, *Cem. Conc. Res.* 89, 56-62 (2016)
7. J. Stepišnik, I. Ardelean, Usage of internal magnetic fields to study the early hydration process of cement paste by MGSE method, *J. Magn. Reson.* 272, 100-107, (2016). doi: 10.1016/j.jmr.2016.09.013 (can be downloaded here).
8. C. Cadar, C. Cotet, L. Baia, L. Barbu-Tudoran, I. Ardelean, Probing into the mesoporous structure of carbon xerogels via the low-field NMR relaxometry of water and cyclohexane molecules, *Microporous Mesoporous Mater.*, 251, 19-25(2017).
9. A. Cretu, C. Mattea, S. Stapf, I. Ardelean, The effect of silica nanoparticles on the pore structure of hydrating cement paste: a spatially resolved low-field NMR study, *Molecular Physics* 117, 1006-1014 (2019)
10. C. Cadar, A. Cretu, M. Moldovan, C. Mattea, S. Stapf, I. Ardelean, NMR T1–T2 correlation analysis of molecular absorption inside a hardened cement paste containing silanised silica fume, *Molecular Physics* 117, 1000-1005 (2019),
11. C. Cadar, I. Ardelean, Surface influence on the rotational and translational dynamics of molecules confined inside a mesoporous carbon xerogel, *Magnetic Resonance in Chemistry* 57 (10), 829-835 (2019)
12. F Gallego-Gómez, C Cadar, C Lopez, I Ardelean, Microporosity Quantification via NMR Relaxometry, *The Journal of Physical Chemistry C* 123 (50), 30486-30491(2019)
13. F Gallego-Gómez, C Cadar, C López, I Ardelean, Imbibition and dewetting of silica colloidal crystals: An NMR relaxometry study, *Journal of colloid and interface science* 561, 741-748(2020)

The offer addressed to the economic environment

Research & development	The NMR diffusometry and relaxometry laboratory provides a variety of measurements for characterization of materials. Between these a list of possible investigations is given below: • Study the effects of various additives and admixtures on cement hydration; • Study the alteration and ageing of rubber or polymers as well as monitoring the polymerization processes; • Determination of liquid content in different porous materials (stone, wood, ceramics, catalysts, bricks, soil, etc.) and their pore size distribution; • Determining the degree of deterioration of lubricants; • Study the effectiveness of contrast agents used in magnetic resonance imaging with applications in medicine; • Determining the water content and its distribution in foods and seeds; • Determining the permeability of soils to certain pollutants; 2D optical images with resolution of up to 1µm of various non-transparent materials.
Consulting	We provide consultancy services on NMR techniques and their applications in medicine, oil industry, study of pollutants transport in soils, pore size characterization, study of cement-based materials, etc.
Training	Training of personal in the field of NMR diffusometry and relaxometry techniques and their applications

RESEARCH LABORATORY FOR COMPOSITE MATERIALS AND ENVIRONMENTAL CHEMISTRY

Contact details

Name	Research Laboratory for Composite Materials and Environmental Chemistry	
Acronym	CMEC	
Logo		
Site		
Address	103-105 Muncii Blv., Room: C 415, C 500, 400641 Cluj-Napoca, Romania	
Faculty Department	Faculty of Materials and Environmental Engineering Physics and Chemistry Department	
Telephone	+40 264 401 778 +40 743 174 195	
Director	Prof. Dr. Eng. Violeta Popescu	
e-mail	violeta.popescu@chem.utcluj.ro	

Areas of expertise

Materials science and engineering: oxides, sulphides, polymeric materials, biomaterials, polymers recycling, nanomaterials;

Environment science and engineering: pollutants separation and degradation trough adsorption or photodegradation;

Team

Prof. PhD. eng. Violeta Popescu, Lecturer Ph.D. eng. Andreia MOLEA, Lecturer Ph.D. eng. George Liviu POPESCU, PhD students: Daniela ROȘCA, Amalia MAZILU, Eng. Pompilia LOPES.

Representative projects

ENZIPLAST – “The Optimization of the Obtaining Process of the Amino-Acids Chelates for Obtaining of New Materials with New Applications”, PNIII-P2-2.1 BG-2016-0204, (2016-2018),

<https://sites.google.com/site/112bg2016enziplast/>

COSMETICIDENT, “New generation of biomaterials for cosmetic dentistry/ project manager”, PN2, <http://granturi.ubbcluj.ro/cosmeticident/Cosmeticident.htm> (2012-2016)

ENDODENT, “Complex biomaterials with high specificity used in endodontic treatments”, PN2, <http://granturi.ubbcluj.ro/endodent/ENDODENT/> (2008-2011)

COMBREG, “Research related to the obtaining of fuels and raw materials from renewable sources. The project aims to develop methods for organic waste materials recycling”

HIDROSOL, “Photoelectrolytical hydrogen production”, CEEX, http://oc1.itimcj.ro/~dsilipas/hidrosol/index_files/Page561.htm (2006-2008)

FLUORODENT, “Biomaterials composites based on new fluorinated monomers reinforced with nano and micro bioactive fillers with remnants anticarcinogenic properties and high adhesion to dental tissues.”, PN2, <http://chem.ubbcluj.ro/pagini/biochimie/radu/florodent/Florodent.htm> (2008-2011)

Significant results

The most representative publications of the past 5 years:

1. M Gheorghe, GL Popescu, D Prodan, I Cojocaru, M Groza, Study of some soil properties and evaluation of the level of contamination with lead in Baia Mare, Aghires and Copsa-Mica, Romania, *Revista de Chimie*, 70 (3), 801-804, 2019
2. G. L. Popescu, N. Filip, M. C. Dudescu, V. Popescu, biodegradable agar-agar foils with possible uses in agriculture. obtaining and characterization, *ISB-Inmateh Agrucultural and Mechanical Engineering*, 8, 448-455, 2019
3. C. V. Prica, T. F. Marinca, B. V. Neamtu, F. Popa, V. Popescu, I. Chicinas, "Structural and thermal investigation of Ta-25 mass% Cu alloy prepared by mechanosynthesis route," *Journal of Thermal Analysis and Calorimetry*, vol. 136, pp. 995-1001, May 2019.
4. Mazilu, C. Sarosi, M. Moldovan, F. Miuta, D. Prodan, A. Antoniac, C. Prejmorean, L. S. Dumitrescu, V. Popescu, A.

- D. Raiciu, and V. Saceleanu, "Preparation and Characterization of Natural Bleaching Gels Used in Cosmetic Dentistry," *Materials*, vol. 12, Jul 1 2019.
5. T. Gherman, V. Popescu, R. Carpa, M. Rapa, G. L. Gavril, M. C. Dudescu, and D. Bombos, "Potential Use of Galium verum Essential Oil for Antibacterial Properties in Gelatin Based Hydrogels Prepared by Microwave Irradiation Technique," *Revista De Chimie*, vol. 69, pp. 575-580, Mar 2018.
6. T. Gherman, V. Popescu, R. Carpa, G. L. Gavril, M. Rapa, and E. E. Oprescu, "Salvia Officinalis Essential Oil Loaded Gelatin Hydrogel as Potential Antibacterial Wound Dressing Materials," *Revista De Chimie*, vol. 69, pp. 410-414, Feb 2018.
7. D. Prodan, M. Filip, I. Perhaita, M. Vlassa, V. Popescu, I. Marcus, and M. Moldovan, "The Influence of Minerals and Lactose Content on the Stability of Whey Protein Powders," *Studia Universitatis Babes-Bolyai Chemia*, vol. 62, pp. 397-410, 2017.
8. A. Molea, V. Popescu, G. L. Popescu, R. C. Suci, A. Dinescu, and M. Moldovan, "Synthesis and characterisation of titanium dioxide nanoparticles sensitised with natural chlorophyll dye extracted from Mentha leaves," *Journal of Optoelectronics and Advanced Materials*, vol. 19, pp. 272-277, Mar-Apr 2017.
9. Cojocaru, D. Prodan, V. Popescu, and M. Moldovan, "SEM Analysis of Composites with TCP/HA/Chitosan/Poly (Methylmethacrylate)," *Materiale Plastice*, vol. 54, pp. 60-62, Mar 2017.
10. A.M. Salantiu, O. Soritau, N. Dirzu, F. Popa, L. Muresan, V. Popescu, P. Pascuta, and C. Popa, "Porous Titanium - an Enhanced Support for Human Osteoblasts after Anodization and c-rgd Immobilization," *Studia Universitatis Babes-Bolyai Chemia*, vol. 60, pp. 45-58, Jun 2015.
11. V. Popescu, A. Molea, A. Dinescu, C. Rusu-Trisca, M. Moldovan, and G. L. Popescu, "Optical Properties of PbS Crystals Obtained on Glass Substrate from Solutions Containing Hydroxylamine Hydrochloride in an Ultrasonic Baths," *Chalcogenide Letters*, vol. 12, pp. 363-373, Jul 2015.
12. G. L. Popescu, N. Filip, A. Molea, and V. Popescu, "The effect of using pyrolysis oils from polyethylene and diesel on the pollutant emissions from a single cylinder diesel engine," *Studia Universitatis Babes-Bolyai Chemia*, vol. 60, pp. 273-288, Dec 2015.
13. S. C. Mosneag, V. Popescu, C. Neamtu, and G. Borodi, "Study on the removal of nitrate in groundwater from Capus, Cluj county by natural zeolite of Mirsid and granular activated carbon," *Desalination and Water Treatment*, vol. 56, pp. 3313-3322, Dec 2015.
14. A. Molea, V. Popescu, N. A. Rowson, I. Cojocaru, A. Dinescu, A. Dehelean, and M. Lazar, "Correlation of Physicochemical Properties with the Catalytic Performance of Fe-Doped Titanium Dioxide Powders," *Industrial & Engineering Chemistry Research*, vol. 54, pp. 7346-7351, Aug 2015.
15. A. Molea, V. Popescu, and N. A. Rowson, "A comparative study of the photo-catalytic performance of amorphous and nano-crystalline TiO₂," *Optoelectronics and Advanced Materials-Rapid Communications*, vol. 9, pp. 431-435, Mar-Apr 2015.
16. M. Moldovan, D. Prodan, V. Popescu, C. Prejmerean, C. Sarosi, M. Saplontai, S. Talu, and E. Vasile, "Structural and morphological properties of HA-ZnO powders prepared for biomaterials," *Open Chemistry*, vol. 13, pp. 725-733, Jan 2015.

Activity with undergraduate students: More than 23 graduation thesis or dissertation.

Activity with PhD students. Research activity with 10 PhD students: 7 with finalized thesis and 3 in progress.

Activity with postdoctoral students. Research activity of 2 postdoctoral students.

Patent no. RO 127718/2015. M. Moldovan, L. Silaghi-Dumitrescu, G. Furtoş, H. Iovu, C. Petrea, V. Popescu, C. Saroşi, S. Boboia, M. Filip, A.L. Colceriu Burtea, R.L. Silaghi-Dumitrescu. Compoziție endodontică pentru obturarea și sigilarea canalelor radiculare.

Patent no. RO128800-A2; RO128800/2017. Prejmerean C, Moldovan M, Prodan D, Silaghi D L, Furtos G, Iovu H, Petrea C, Popescu V, Pascualau V, Sarosi C, Boboia S, Filip M, Colceriu B A L, Silaghi D R L, Damian C M, Sarosi L C, Matrice organică și compozit de restaurare indirectă pentru utilizare în stomatologie.

Products

1. IR photosensitive PbS films; semiconducting PbS, CuS, CdS, TiO₂, ZnO, Fe₂O₃ films and powders.
2. Fuels from plastic waste.
3. Biodegradable plastic materials.
4. Diverse natural extracts.

The offer addressed to the economic environment

Research & development	The correlation between optical, structural and morphological properties of semiconductors. The obtaining of materials with photocatalytic properties. Chemical recycling of plastic materials. Fuels obtaining, characterization and testing.
Consulting	FT-IR and UV-VIS spectroscopy. Plastic materials characterization and recycling.
Training	Rapid identification of organic compounds by IR spectroscopy using ATR-FTIR. Elaboration of UV-VIS spectroscopic quantitative analysis methods. Polymers recycling.

LABORATORY OF ELECTROCHEMISTRY IN ADVANCED MATERIALS

Contact details

Name	Laboratory of Electrochemistry in Advanced Materials
Acronym	ELMA
Logo	
Site	http://chimie.utcluj.ro/elma
Address	103-105 Muncii Blv., Room: C 502, 400641, Cluj-Napoca, Romania
Faculty Department	Faculty of Materials and Environmental Engineering Physics and Chemistry Department
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Fax	+40 264 415054
Director	Prof.em.Dr. Chem. Elena Maria Pică
e-mail	empica@yahoo.com , elena.pica@chem.utcluj.ro



Areas of expertise

Achievement of some electrochemical sensors.
 Synthesis of some advanced materials used for achievement of membrane sensors.
 Chemical kinetics of rapid reactions.
 Modelling and simulation of physical-chemical processes.

Team

Prof.Em.Dr. Chem. Elena Maria Pică, Assoc.Prof.Dr.Chem. Mihaela Ligia Ungureșan, Assoc.Prof.Dr.Eng. Dana - Adriana Iluțiu - Varvara,
 Prof.Dr.Phys. Eugen Culea, Dr.Eng.Ec. Luminița Cristina Pirău, Dr. Mioara Zagrai, Dr.Eng. Marius Roman,
 Drd.PhD.students: Cornel Sava, Drd.PhD.students: Dragoș Teodor Lup

Representative projects

LAREAN, "Regional laboratory for complex spectroscopic and electrochemical analyzed", BCUM, http://ro4096.uefiscsu.ro/componenta3/detalii.php?comisie=1&id=403&unitate=componenta3_cncsis&prog=b (1999-2009)
NITRITSENZ, "Nitrite selectiv electrochemical sensor for controlling nitrite in food products", PNCDI-AGRAL, <http://www.precis.ro/modules.php?name=News&file=article&sid=97> (2004-2007)
MAVOPTTEL, "Multifunctional nanocomposites based supramolecular optoelectronic properties, photochemical, electrochemical and bio-precursors for advanced materials", CEEX, <http://acad-ichtm.edu.ro/nationale/mavoptel.htm>; http://www.infoinvent.md/pdf/infoinvent/catalog/2013/section_A.pdf (2006-2008)
BIOAMBREG, "Development of green products in biodegradable, packaging and components for achieving protection", CEEX, http://www.inma.ro/pagina_web_parteneriate/Cioica/DatePagWEB_1.htm (2007-2010)
 "Research concerning the characterization of the oily mill scale in order to identify a optimum method for reduction of the quantities of hazardous wastes landfilled", Internal competition for Research/ Development/ Innovation C.I. type 1.1-TEMA 4, <http://research.utcluj.ro/index.php/lansare-competitii-interne.html> (2016-2017)

Significant results

The most representative publications of the past 5 years:

1. Cornel Sava; Elena Maria, Pica; Marius-Daniel, Roman, "Considerations Regarding the Use of Sludge in Agriculture", in *Research Journal of Agricultural Science*, vol.51, no.2, pp.57-63, Published: 2019.
2. Iluțiu-Varvara, D. A.; Tintelecan, M.; Acui, C.; Sas-Boca, I. M.; Hădărean, A.; Rus, T. and Mare, R. "An Assessment of the Substance Losses from Charge Composition Used to the Steelmaking - Key Factor for Sustainable Steel Manufacturing", in *Procedia Manufacturing*, vol.32, pp.15-21, Published: 2019.
3. Dragos Teodor, Lup; Ana Maria, Stroe; Paul Mihai, Chezan and Elena Maria, Pica, "The Importance of Waste Incineration", in *Studia Universitatis "Babes-Bolyai", Series: "Ambientum"*, vol.63, no.1, pp.43-48, Published: 2018.
4. Iluțiu-Varvara, D.A.; Acui, C.; Mârza, C. M.; Sas-Boca, I.M. and Tintelecan, M. "Assessment of recycling potential of the oily mill scale in the steelmaking industry", in *Procedia Manufacturing*, vol. 22, pp. 228-232, Published: 2018.

5. Mioara, Ferent (Zagrai), 2018. "Sisteme oxidice vitroase cu aplicații în protecția mediului", in *Teza de doctorat / UTCN*, Conducător de doctorat, Elena Maria Pică, Published: 2018.
6. Ilutiu-Varvara, Dana-Adriana; Aciu, Claudiu; Pica, Elena Maria and Sava, Cornel, "Research on the Chemical Characterization of the Oily Mill Scale for Natural Resources", in *Procedia Engineering*, vol.181, pp.439-443, Published: 2017.
7. Andra Cristina, Gagi; Fulvio, Amato; Xavier, Querol; Oriol Font, Piqueras and Elena Maria, Pica, "Assessing sources and contaminates of soil in public parks and playgrounds of Romanian cities located on the external side of the Carpathian mountain chain", in *"Ecoterra", Journal of Environmental Research and Protection*, vol.14, no.2, pp.10-26, Published: 2017.
8. Cornel, Sava; Iulia, Dragan; Ana Maria, Stroe; Luminita Cristina, Pirau and Elena Maria, Pica, "Reducing the Sludge Quantity Produced from Used Water Purification - A Source of Profit", The IVth International Conference of Young Researchers, New Trends in Environmental and Materials Engineering, "TEME 2017", "Dunarea de Jos" University of Galati, Faculty of Engineering, 25th - 27th October 2017, Galați, ROMANIA, in *The Annals of "Dunărea de Jos" University of Galati. Fascicle IX. Metallurgy and Materials Science, Special Issue*, no.4, pp.61-63, Published: 2017.
9. Rada, S.; Unguresan, Mihaela Ligia; Bolundut, Liviu; Rada, Marius; Vermesan, Horatiu; Pica, Elena Maria and Culea, Eugen, "Structural and electrochemical investigations of the electrodes obtained by recycling of lead acid batteries", in *Journal of Electroanalytical Chemistry*, vol.780, pp.187-196, Published: 2016.
10. S., Rada; M., Zagrai; M., Rada; E., Culea; L., Bolundut; M.-L., Unguresan and E.M., Pica, "Spectroscopic and electrochemical investigations of lead-lead dioxide glasses and vitroceramics with applications for rechargeable lead-acid batteries", in *Ceramics International*, vol.20. no.3, pp.3921-3929, Published: 2016.
11. Cornel, Sava; Elena Maria, Pică and Marius D., Roman, "The Biogas Production into the Wastewater Treatment Plants as an Alternative Source of Energy", 10th Edition of National with International Symposion: "Environment & Progress", 29th - 30th October 2015, Cluj-Napoca, ROMÂNIA, in *"Ecoterra", Journal of Environmental Research and Protection*, vol.13, no.1, pp.14-16, Published: 2016.
12. Cornel, Sava; Marius-Daniel, Roman and Elena Maria, Pica, "Effective Methods of Reducing the Costs for Drying Sludge From Wastewater Treatment Plants", A XVI-a Conferință internațională "Profesorul Dorin PAVEL- fondatorul hidroenergeticii românești" Sebeș, România 10-11 iunie 2016, in *Știință și Inginerie, An XVI*, Editura AGIR, București, vol.28, pp.457-462, Published: 2016.
13. A.C., Gagi; E.M., Pica; X., Querol and C.S., Botezan, "Analysis of predictors related to soil contamination in recreational areas of Romania", in *Environmental Science and Pollution Research*, vol.22, no.23, pp.18885-18894, Published: 2015.
14. D. A., Ilutiu - Varvara; L., Brândusan; G., Arghir and E.M., Pica, "Researches about the characterization of metallurgical slags for landfilled wastes minimization", in *Environmental Engineering and Management Journal (EEMJ)*, vol.14, no.9, pp.2115-2126, Published: 2015.
15. Andra Cristina, Gagi; Camelia S., Botezan; Luminita Cristina, Pirau; Elena Maria, Pica; C., Tanaselia and M., Ursu, "Influence of the number of inhabitants, surface and population density on soil contamination with As, Pb, Hg, Zn, Cd and Cu in urban of recreational areas Romania", in *"Ecoterra", Journal of Environmental Research and Protection*, vol.12, no.1, pp.76-82, Published: 2015.

Significant solutions:

Determination of various ions in different environmental samples;
Analytical control of chemical and biochemical products/processes;
Research-development studies performed, for environmental pollution.

Products and technologies:

1. The development of ecologic products from biodegradable materials for some packs and protection equipment.
2. Electrocatalysis of some transformation reaction for a major different pollutants in inorganic and organic mater.
3. Nanomaterials with applications in mediated electrocatalysis using modified electrodes.

Patents:

16. Dana Vlascici, Elena Maria Pică, Cosma - Făgădar Eugenia, Bizerea Otilia, Costișor Otilia, Cosma Viorica, 2010. "Senzor potențiometric nitrit-selectiv", Patent No.122.790, in *B.O.P.I. Section:Patents*, No.1, pp.72;
http://www.osim.ro/publicatii/brevete/bopi_2010/bopi110.pdf
17. Eugenia. Fagadar-Cosma, Dana. Vlascici, Elena Maria Pică, Otilia Costișor, Viorica Cosma, Liliana Olenic, 2012. Otilia Bizerea, "Procedure for Obtaining of A Highly Selective Potentiometric Sensor for Silver Ion Detection Based on Porphyrin Ionophore", *Patent* No.123.447, in *B.O.P.I. Section:Patents*, No.5, pp.104;
http://www.osim.ro/publicatii/brevete/bopi_2012/bopi_inv_05_2012.pdf

The offer addressed to the economic environment

Research & development	The development of some methods for achievement of electrochemical sensors and achievement of some new sensors used in different measurements (water and soil of environmental measurements) The development of advanced modeling procedures, identification, monitoring and control of processes occurring in electrochemical interface.
Consulting	Consulting, design, research and prototyping of different sensors based on reduction of ions element.
Training	Advanced Materials Electrochemistry Obtaining of the Electrochemical Sensors Modelling and Simulation of the Chemical Processes Synthesis of Advanced Materials

GROUP FOR RESEARCH AND DESIGN IN URBAN PLANNING

Contact details

Name	Group for Research and Design in Urban Planning
Acronym	CPU
Logo	
Site	http://research.utcluj.ro/tl_files/research/Research%20Domain/Architecture/1_Agachi.pdf
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Faculty Department	Faculty of Architecture and Urban Planning Urban Planning Department
Telephone	+40751055365
Fax	+40 264 402558
Director	Conf. Dr. Arh. Octav Silviu OLĂNESCU
e-mail	octav.olanescu@arch.utcluj.ro



Areas of expertise

Research in urban design and urban planning. **Consulting** in urban design and urban planning
Developing planning documentations and projects: General urban plans and Regional urban plans, together with related local regulations, Urban Detail plans, Protection and development of the built heritage.
Design in architecture and building restoration. **Design** in urban design and urban planning.

Team

Conf. Dr. Arh. Octav Silviu OLĂNESCU

Prof. Dr. Arh. Mihaela Ioana AGACHI, Conf. Dr. Arh. Vlad Sebastian RUSU, Ș. L. Dr. Arh. Moldovan SILIVAN

Representative projects

"International Architectural competition for the spatial planning of the Tamula lakeside area", Voru, Estonia, organized by the Town hall of Voru city and the Estonian Union of Architects", <http://www2.arhliit.ee/english/competitions/domestic/4538/> (2008)
 "International Architectural competition for reconstruction of Rakvere's St Paul's church", Rakvere, Estonia, organized by the City of Rakvere/ Estonia", <http://www2.arhliit.ee/english/competitions/domestic/4550/> (2009)
 "International competition for the Memorial of Aeronautics, Bucharest", <http://www.oar.org.ro/concurs.php?id=10&st=1> (2009)
 "General Urban Plan with related local regulation (PUG and RLU) for Azuga Town, Prahova County", (2009)
 "International competition for the theme of the Cultural Center of Transylvania in Cluj-Napoca, organised by the City of Cluj-Napoca", <http://www.archdaily.com/112383/transylvania-cultural-center-ioana-mihaela-agachi-octav-s-olanescu-anamaria-c-popa-vlad-s-rusu/> (2010)
 "Historical and urban study for P.U.G. of Cluj-Napoca", (2010)

Significant results

The most representative publications of the past 5 years:

Articles:

1. Olănescu, Octav Silviu, "There is no urban design for the new postsocialist developments", *Acta Technica Napocensis: Civil Engineering & Architecture*, Vol. 59 No. 3, 2016
2. Anca Andreia Șelariu, Mihaela Ioana Maria Agachi, Temporary architecture incorporated into abandoned coal mine areas, *Acta Technica Napocensis: Civil Engineering & Architecture* Vol. 60 No. 3 (2017), pp. 88-100.

3. Olănescu, Octav Silviu, Agachi, Mihaela Ioana, "Public Space as a Sustainable Built Environment Feature", *Acta Technica Napocensis: Civil Engineering & Architecture* (Special Issue: Sustainable Development and the Built Environment. QUESTIONS 2015), 2015,
4. Agachi, Mihaela Ioana, Olănescu, Octav Silviu, "New residential area on the outskirts of Zalău", *Acta Technica Napocensis: Civil Engineering & Architecture* (Special Issue: Sustainable Development and the Built Environment. QUESTIONS 2015), 2015.

Studies:

1. 2019 - Urban Regeneration Guides for the Collective Housing Neighborhoods - Constanța

Books

1. Olănescu, Octav Silviu, *Aspecte ecologice în determinarea mediului construit*, Cluj-Napoca: U.T. Press, 2018
2. Agachi, Mihaela Ioana, Olănescu, Octav Silviu, *Design Urban, Zona Expo-Transilvania, Propuneri de dezvoltare urbanistică*, Cluj-Napoca: U.T. Press, 2015.
3. Rusu, Vlad Sebastian, *Evoluția urbanistică a Clujului interbelic*, Editura Academiei Române - Centrul pentru Studii Transilvane, Cluj-Napoca, 2015.

International competitions awards:

1. 2019 - 1st Prize at the International competition for *Sopor Masterplan*, Cluj-Napoca
2. 2019 - 2nd Prize at the International competition for *Cetățuia Hill*, Cluj-Napoca
3. 2018 - 1st Prize at the International competition for *Parcul Feroviar*, Cluj-Napoca
4. 2017 - 1st Prize at the International competition for *Turnul Pompierilor*, Cluj-Napoca
5. 2017 - The grand prize of the European Union for Cultural Heritage – Europa Nostra – „Reabilitarea și refuncționalizarea Palatului Cultural din Blaj”

Exhibitions:

1. 2019 – National exhibition Zilele Uzinei de Apă – Arhitectura între tradiție și inovație, Suceava
2. 2019 – Exhibition of the *Sopor Masterplan Competition*, Pavilion Casino Parc Central, Cluj-Napoca
3. 2019 - Exhibition of the *Cetățuia Hill Competition*, Pavilion Casino Parc Central, Cluj-Napoca
4. 2018 - Exhibition of the *Parcul Feroviar Competition*, Casa de cultură a studenților, Cluj-Napoca
5. 2017 - Exhibition of the *Turnul Pompierilor Competition*, Filiala OAR Transilvania, Cluj-Napoca

The offer addressed to the economic environment

Research & development	Studies regarding urban design and urban planning and history of urbanism. Architectural design, building restoration design, urban design.
Consulting	Our group is open to cooperate in interdisciplinary teams for research in urban design and urban planning, at national and international level, with researchers, teachers from universities and with professional associations.
Training	The group is able to approach general urban plans, regional urban plans, urban detail plans, plans for territory improvement at different levels and also architectural projects.

PROJECTED SPACE | PRODUCED SPACE | PERCEIVED SPACE - RESEARCH GROUP

Contact details

Name	Projected Space Produced Space Perceived Space Research Group	
Acronym	ppp SPACE	
Logo		
Site	https://www.facebook.com/groups/spatiuproiectat.spatiuprodus.spatiuperceptut/ , http://research.utcluj.ro/index.php/architectura.html	
Address	72-76 Observatorului str, room A03b, Cluj-Napoca, 400363	
Faculty	Faculty of Architecture and Urban Planning/	
Department	Department of Architecture	
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Fax	-	
Director	Dr. Arch. Dana JULEAN	
e-mail	dana.julean@arch.utcluj.ro , spatiuproiectat.spatiuprodus.spatiuperceptut@groups.facebook.com	



Areas of expertise

- research in theory of architecture and architecture criticism
- interdisciplinary studies bordering on theory of architecture, culture theory, psychology, philosophy and sociology
- miscellaneous studies related to space, spatiality, and interpretations of space

Team

active members:

Senior Lecturer Dr. Arch. Dana JULEAN; Senior Lecturer Dr. Arch. Smaranda TODORAN; Senior Lecturer Dr. Arch. Adriana MĂGERUȘAN; Assist. Prof. Dr. Arch. Dan-Ionuț JULEAN

external collaborators:

T. Assist. Dr. Kinga SZABO

Representative projects

„PARTNERSHIP for organising a series of master classes in architecture within the project «Universitatea Vârstei a 3-a (U3)» Cluj-Napoca [‘University for elderlies’ Cluj-Napoca]”

period: December 2018 - January 2019

partners: Platforma România 100 and the Technical University of Cluj-Napoca, through the research group „pppSpace” [Projected Space | Produced Space | Perceived Space]

team: CROITORU, Andra for Platforma România 100 and JULEAN, Dana for pppSPACE

„PARTNERSHIP for collaboration for the “Up STAIRS” project

period: June 2017 - June 2018

partners: Asociația pentru Teatru și Carte (PETEC) and the Technical University of Cluj-Napoca, through the research group „pppSpace” [Projected Space | Produced Space | Perceived Space]

team: MARINESCU, Irina and UȘURELU, Alina for PETEC and JULEAN, Dana for pppSPACE

Significant results

The most representative publications of the past 5 years:

1. POP, Dana; MATU, Silviu-Andrei; SZENTÁGOTAI, Aurora. „Experimental Assessment between Building Regulations and Claustrophobia”, Urbanism. Arhitectură. Construcții vol. 9 nr. 3 (2018): 251-264. ISSN 2069-6469 <http://uac.incd.ro/>
2. POP, Dana. “Theorising Between Space and Place: A Case Study on Perceptive Architecture - Serpentine Gallery Pavilions”, Philobiblon vol. XX, nr. 2 (2015): 356-381. Cluj-Napoca: Cluj University Press. ISSN: 1224-7448 <http://www.philobiblon.ro/> (BDI - ProQuest, ERIH Plus, Scopus-SciVerse)
3. POP, Dana. „Experiencing the relationship between architectural space and the major space phobias”, Urbanism. Arhitectură. Construcții vol. 6 nr. 4 (2015): 33-44. Bucharest: Institutul Național de Cercetare – Dezvoltare în

- Construcții, Urbanism și Dezvoltare Teritorială Durabilă URBAN-INCERC. ISSN: 2069-0509 <http://uac.incd.ro/> (BDI - Copernicus Master Journal List, Ulrich's Web Global Serials Directory, Ebscohost, ProQuest)
4. POP, Dana; JULEAN Dan-Ionut. "The Monument Between Place and Fetishism", Acta Technica Napocensis: Civil Engineering & Architecture vol. 58, nr. 1 (2015): 5-16. Cluj-Napoca: UT PRESS. ISSN: 1221-5848 <http://constructii.utcluj.ro/ActaCivilEng/> (BDI - Index Copernicus)
 5. JULEAN Dan-Ionut; POP, Dana. "The Monument: From Real to Virtual Space. A Case Study of Jewish Heritage", Acta Technica Napocensis: Civil Engineering & Architecture vol. 58, nr. 4 (Special Issue: International Workshop in Architecture and Urban Planning : Sustainable Development and the Built Environment. QUESTIONS 2015): 156-163. ISSN: 1221-5848 <http://constructii.utcluj.ro/ActaCivilEng/>
 6. TODORAN, Smaranda Maria. "Landscape, Architecture and the City: Questions on an Ecological Approach to Plant Design in Architectural and Urban Contexts", Acta Technica Napocensis: Civil Engineering & Architecture vol. 58, nr. 4 (Special Issue: Questions 2015): 256-262. Cluj-Napoca: UT PRESS. ISSN: 1221-5848 <http://constructii.utcluj.ro/ActaCivilEng/> (BDI - Index Copernicus)
 7. TODORAN, Smaranda Maria. "Questions on Time at the Crossroads of Architecture And Landscape Design", Acta Technica Napocensis: Civil Engineering & Architecture vol. 58, nr. 4 (Special Issue: Questions 2015): 290-297. Cluj-Napoca: UT PRESS. ISSN: 1221-5848 <http://constructii.utcluj.ro/ActaCivilEng/> (BDI - Index Copernicus)
 8. TODORAN, Smaranda Maria, PATACHI, Laura. "Cultural Sustainability and Issues of Urban Memory", Acta Technica Napocensis: Civil Engineering & Architecture vol. 58, nr. 4 (Special Issue: Questions 2015): 227-234. Cluj-Napoca: UT PRESS. ISSN: 1221-5848 <http://constructii.utcluj.ro/ActaCivilEng/> (BDI - Index Copernicus) articles in conference proceedings
 9. JULEAN, Dana. "Why Architects See Things Differently - An Architectural Approach on Teaching Space Perception", in Proceedings - 5th Global Academic Meeting, GAM 2016, 24-26 March, Budapest, Hungary. Kokani: European Scientific Institute, ESI, 2016, pp. 1-8. ISBN 978-608-4642-48-0, doi: 10.19044/esj.2016p2, <http://gameeting.info/images/5th.GAM.2016.pdf>
 10. SZABO, Kinga, POP, Dana, JULEAN, Dan-Ionut, SZAMOSKÖZI, Ștefan. "The Relationship Between Analogical Reasoning and Creativity", in Conference Proceedings: Sgem International Multidisciplinary Scientific Conference On Social Sciences & Arts. Sofia: STEF92 Technology Ltd., 2015, pp. 235-241. ISBN 978-619-7105-44-5, ISSN 2367-5659 <http://www.sgemsocial.org>
 11. POP, Dana. "Experimentând relația dintre spațiul arhitectural și fobiile spațiale majore", in Lucrările conferinței de cercetare în construcții, economia construcțiilor, urbanism și amenajarea teritoriului vol. 9, ed. Alexadru-Ionuț Petrișor și Vasile Meită. Bucharest: Institutul Național de Cercetare – Dezvoltare în Construcții, Urbanism și Dezvoltare Teritorială Durabilă URBAN-INCERC, 2015, pp. 45-55. ISSN 2393-3208, <http://www.incd.ro/conferinte/>
 12. POP, Dana. "Compoziția și percepția spațiului - o perspectivă arhitecturală", in Simpozionul Preuniversitară ediția a XVII-a, 21 martie 2015. CD-ROM. Cluj-Napoca: Editura Casei Corpului Didactic Cluj, 2015, [f.p.]. ISSN 1842-7618 http://www.iscjc.ro/htm/2015/ianuarie/anunt_simpozion_cont_modificat.pdf

books

MĂGERUȘAN, Adriana; DASCĂLU, Dragoș. *leftin și bun. LOCUINȚE ACCESIBILE*, Cluj-Napoca: UT Press, 2017. ISBN 978-606-737-270-0 <http://utcluj.ro/editura/>

POP, Dana. *Arhitectură, percepție și frică*, București: Paideia, 2016. ISBN: 978-606-748-130-3 <http://www.paideia.ro/>

POP, Dana. *Despre percepția spațiului în arhitectură*, Bucharest: **Paideia** (cod CNCIS 267), 2015. ISBN: 978-606-748-038-2 <http://www.paideia.ro/>

TODORAN, Smaranda Maria. *Construire dans le construit. Le détail à la Fondation Querini Stampalia*, Sarrebruck, Germany: Éditions Universitaires Europeennes - OmniScriptum GmbH & Co. KG, 2015 (ISBN: 978-3-8416-7588-0) <https://www.editions-ue.com/>

The offer addressed to the economic environment

Research & development	• theory of architecture, architecture criticism • interdisciplinary studies bordering on theory of architecture, culture theory, psychology, philosophy and sociology • architectural research methodology • culture theory • cultural sustainability • politics of heritage • socio-spatial practices • space psychology and perception • tactical urbanism
Consulting	• studies in the fields of: theory of architecture, architecture criticism, interdisciplinary research • research methods on architecture • evidence based design • spatial experiments - architecture, art, urban design • editorial projects
Training	• interdisciplinary workshops • summer schools • courses • masterclasses

ARCHITECTURE. TIME. HABITUDES RESEARCH GROUP

Contact details

Name	Architecture. Time. Habitudes Research Group
Acronym	ATH
Logo	
Site	http://research.utcluj.ro/index.php/architectura.html
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Director	Dr. habil. Dan-Ionuț JULEAN, architect Associate Professor
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Areas of expertise

History and theory of architecture
Art history – decorative and applied arts
Building restoration
Cultural heritage enhancement
Style and decoration – cultural environment and lifestyle
Cultural tourism

Team

Assoc. Prof. Dr. Arch. Dan-Ionuț JULEAN – Senior Lecturer Dr. Arch. Dragoș Ștefan Dascălu, Senior Lecturer Dr. Arch. Dana Julean, T. Assist. Dr. Arch. Daniel Șerban, Ph.D. student Arch. Maria-Alexandra Sas, Ph.D. student Arch. Miruna Moldovan, Ph.D. student Ileana-Ana Abos, Ph.D. student Alida-Ozana Crișan.

External collaborators:

Arch. Eugen-Cristian Rus, Dr. Dana Maria Mărcuș, licensed in history; Dr. Arch. Endre Ványolos, Dr. Arch. Vlad Nicolae Coheci; Petru Dimoff, photographer.

Representative projects

Four research projects and 3 partnerships, within the past 5 years:

PARTNERSHIP for organising a series of master classes in architecture within the project «Universitatea Vârstei a 3-a (U3)» Cluj-Napoca [‘University for elderlies’ Cluj-Napoca]”

period: December 2018 - January 2019

partners: Platforma România 100 and the Technical University of Cluj-Napoca

PARTNERSHIP for professional activities within the project „Free Time Factory”, Turda

period: March 2016 - December 2018

partners: Fundația Rațiu pentru Democrație and the Technical University of Cluj-Napoca

PARTNERSHIP for organising a design competition – a piece of furniture made of scrapped books period: March 2016 - July 2016

partners: „Lucian Blaga” Central University Library of Cluj-Napoca and the Technical University of Cluj-Napoca

RESEARCH PROJECT for enhancing built heritage – „Free Time Factory” the former Brewery in Turda

period: May 2018 - June 2018

partners: Fundația Rațiu pentru Democrație and the Technical University of Cluj-Napoca

RESEARCH PROJECT for enhancing built heritage – the Central Cemetery in Cluj-Napoca

period: September 2017 - October 2017

partners: Ordinul Arhitecților din România – Filiala Teritorială Transilvania and the Technical University of Cluj-Napoca

RESEARCH PROJECT for enhancing built heritage – „Free Time Factory” the former Brewery in Turda

period: February 2017 - June 2017

partners: Fundația Rațiu pentru Democrație and the Technical University of Cluj-Napoca

RESEARCH PROJECT for enhancing built heritage – the Central Cemetery in Cluj-Napoca

period: October 2016 - November 2016

partners: Ordinul Arhitecților din România – Filiala Teritorială Transilvania and the Technical University of Cluj-Napoca

Significant results

The most representative publications of the past 5 years:

1. Julean, D.I., „«Spre Oradea» în căutarea memoriei unei comunități evreiești”, *Arhitectura* – revista Uniunii arhitecților din România fondată în 1906, No. 4 (682) (2019): pp. 42-49.
2. Julean, D.I., “The Architecture of a Photograph: Deconstructing La Castiglione’s Scherzo di follia”, *Philobiblon*, vol. XXII, Nr. 2 (2017), pp. 159-173.
3. Julean D.I., “On Teaching History of Architecture in Higher Education or How to Use Sir Banister Fletcher’s A History of Architecture for a 21st Century Course in Architectural History – an Overview”, *European Scientific Journal*, Vol.12, nr.10, pp.9-18, 2016.
4. Julean, D.I., “Romania and Its Jewish Museums”, *East European Jewish Affairs*, vol. 45, Nos. 2-3 (June 2015), pp. 279-289.
5. Julean, D.I.; Pop, Dana, “The Monument: From Real to Virtual Space. A Case Study of Jewish Heritage”, *Acta Technica Napocensis: Civil Engineering & Architecture*, vol. 58, No. 4 (2015), pp. 156-163.
6. Pop, Dana; Julean, D.I., “The Monument: Between Place and Fetishism”, *Acta Technica Napocensis : Civil Engineering & Architecture*, vol. 58, Nr. 1 (2015), pp. 5-15.
7. Sas, Maria Alexandra, “Reconsiderarea unei ruine. Studiu pentru valorificarea ansamblului Castelului Haller-Jósika din Garbou”, *Transsylvania Nostra*, Year XIII, No. 50 (2019), pp. 20-31.
8. Paun-Constantinescu, Ilinca; Dascălu, Dragoș, Sucală, Cristina, “An Activist Perspective on Industrial Heritage in Petrița”, *The Public Historian*, Vol. 39, No. 4 (2017), pp. 114–141;
9. Szabó, Kinga; Pop, Dana; Julean, D.-I.; Szamosközi Ștefan, “The Relationship Between Analogical Reasoning and Creativity”, in *Conference Proceedings: Sgem International Multidisciplinary Scientific Conference On Social Sciences & Arts*, Sofia: STEF92 Technology Ltd., 2015, pp. 235-241.

Books:

1. Julean D.I.; Julean Dana, *Catedralele Unirii la vest de Carpați / The Cathedrals of the Great Union to the West of the Carpathians*, Cluj-Napoca: Presa Universitară Clujeană, 2018. (e-book).
2. Julean, D.I.; Julean Dana, *Moștenirea familiei Bánffy în Transilvania... / A Bánffy-család öröksége Erdélyben... / The Bánffy Family Inheritance in Transylvania...*, Cluj-Napoca: Presa Universitară Clujeană, 2017. (e-book).
3. Julean, D.I., *Spațiul iudaic, un spațiu al comunității*, București: Paideia, 2016.
4. Dascălu, Dragoș; Măgerușan, Adriana (coord.), *Locuințe accesibile. Ieftin și bun*, Cluj-Napoca: UT Press, 2017.

The offer addressed to the economic environment

Research & development	specialized studies (architecture, history and theory of architecture / art history, genealogy) heritage studies & enhancement of the cultural and artistic heritage architectural restoration curating exhibitions cultural tourism scenography
Consulting	architectural and artistic heritage (history of architecture, art history) architectural restoration decorative and applied arts – valuation of antique furniture and decorative objects curating activities – co-curating exhibitions, , exhibit design and solutions from conception to realisation cultural and academic tourism scenography Transylvanian genealogy
Training	the possibility to co-organise workshops, summer schools, masterclasses, specialised courses, etc.

INVENTARIUM – RESEARCH GROUP FOR THE (RE)COGNITION OF ARCHITECTURAL AND URBAN HERITAGE

Contact details

Name	INVENTARIUM: research group for the (re)cognition of architectural and urban heritage	
Acronym	INVENTARIUM	
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Faculty Department	Faculty of Architecture and Urban Planning	
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e-mail	virgil.pop@arch.utcluj.ro	

Areas of expertise

The conservation, and rehabilitation of old buildings and other forms of heritage, including urban rehabilitation and the rehabilitation of historical parks.

Team

Prof. PhD habil. Arch. Virgil POP
 Reader PhD Arch. Cristina PURCAR
 Reader PhD Arch. Andreea MILEA
 Lecturer PhD Eng. Imola KIRIZSÁN
 Lecturer PhD Arch. Silivan MOLDOVAN
 Teaching Assistant PhD Arch. Mihai RACU

Representative projects

Transformation of medieval religious buildings during the Counter-Reformation: comparative study between churches of Rome and churches in Transylvania.

The research involved students of the fourth year, in the context of study trips to Rome (2013 and 2016) and participation in exhibitions and conferences. Coordinators: Prof. PhD habil. Arch. Virgil Pop, Reader PhD Arch. Cristina Purcar.

Transylvanian railway architectural heritage: documentation through photography, surveying, sources and documents research, publishing studies (including recommendations for interventions), conservation projects in partnership with CFR (Romanian Railway Company, Cluj Regional) (registration no.: FAU 444/24 / 10.2016).

The research involved students of the first year, by the *Practice* of survey work. Surveys were carried out at stations Jibou (2015), Răstoci (2016), Oradea (2017), Satu Mare (2017), Baia Mare (2019) stations. Coordinators: Reader PhD Arch. Cristina Purcar, Reader PhD Arch. Andreea Milea.

The public image of the monuments of Cluj: documentation through photography, surveying, archiving and setting up a digitized database.

The research involved students of the fourth year, through *Monuments Conservation* projects they develop (2015-2017, 2nd semester). Coordinators: Prof. PhD habil. Arch. Virgil Pop, Reader PhD Arch. Andreea Milea, T. Assist. PhD Arch. Mihai Racu.

Surveying the monuments of Cluj: documentation through photography, surveying, archiving and setting up a digitized database.

The research involved students of the first year, by the *Practice* of survey work (2014-2018). Coordinator: Reader PhD Arch. Andreea Milea.

Historical Parks of Transylvania: field research, sources and documents research, publishing studies (including recommendations for interventions). Coordinator: Lecturer PhD Arch. Andreea Milea.

Documentation through photography of vernacular built heritage in The Ethnographic Park Romulus Vuia, Cluj (in partnership with The Ethnographic Museum of Transylvania, Cluj) (registration no.: FAU 510/11.11.2016, EMT 2806/21.11.2016).

The research involved students of the architectural photography group *photo-FAU cluj*. Coordinator: Reader PhD Arch. Andreea Milea.

Significant results

1. Andreea Milea: *The Beginnings of Transylvanian Public Urban Parks*, Transsylvania Nostra anul XII nr. 45 (1/2018).
2. Andreea Milea: *The Csáki Manor House Park in Almaşu, Sălaj County. Historical and contemporary data*, Transsylvania Nostra anul XI nr. 42 (2/2017).
3. Andreea Milea: *The Kendi-Kemény Manor House Park in Brâncoveneşti, Mureş County. Historical and contemporary data*, Transsylvania Nostra anul XI nr. 41 (1/2017).
4. Andreea MILEA: *Bánffy Manor House Park in Răscruci, Cluj County. Historical and Contemporary Data*, Transsylvania Nostra anul X nr. 38 (2/2016).
5. Andreea MILEA: *The Nalácz-Fáy Manor House Park in Nălaţvad, Hunedoara County. Historical and Contemporary Data*, (part I), Transsylvania Nostra anul IX nr. 35 (3/2015), (part II) Transsylvania Nostra anul IX nr. 36 (4/2015)
6. Andreea MILEA: *Wesselényi Manor House Park in Jibou, Sălaj County. Historical and Contemporary Data*, Transsylvania Nostra anul IX nr. 33 (1/2015).
7. Andreea MILEA: *Wass-Bánffy Castle Park in Gilău, Cluj County. Historical and Contemporary Data*, Transsylvania Nostra anul VIII nr. 31 (3/2014).
8. Virgil POP, Cristina PURCAR: *Aspecte stilistice ale arhitecturii feroviare interbelice din Transilvania*, lucrare la Congresul istoricilor din România, Academia Română şi Universitatea Babeş-Bolyai, Cluj, august 2016.
9. Virgil POP: „Armenopolis - a baroque town”, in *Die Kunst der Armenier im Oestliches Europa*, Böhlau Verlag, Koln, 2014.
10. Cristina PURCAR: *Mapping Territorial Cohesion Through Railway Architecture. Transylvanian Case Studies, 1860s – WWI*, lucrare la seminarul internaţional “From state-building to European integration. The role of the railway network in the social and territorial integration of Europe (1850 - 2017)”, Barcelona, mai 2018 (în curs de publicare).
11. Cristina PURCAR: *Photography, Railways and Landscape in Transylvania, Romania. Case Studies in Digital Humanities*, lucrare la seminarul internaţional “Mapping Historical Landscapes in Transformation: Methods, Applications and Challenges”, University of Leuven, 24-25 noiembrie 2017 (în curs de publicare).
12. Cristina PURCAR: *‘A Fabulous Painting, In Which I Would Live’ - Paul Delvaux’s pictorial poetic of the railway periphery - between art and urban history*, sITA – studies in History and Theory of Architecture, nr.4/2016, pp. 66-82.
13. Cristina PURCAR: *At Home by the Tracks. Domesticity in Proximity of Railway Space in (Early) Modern Art*, Questions, International Workshop, Sustainable Development and the Built Environment, Acta Technica Napocensis: Civil Eng. & Arch., vol. 58, nr. 4 (2015)

The offer addressed to the economic environment

Research & development	History of architecture and art studies, archive studies, documentation through photography of built and urban heritage. Surveying and diagnosis of built and urban heritage objects
Consulting	Recommendations for interventions, built and urban heritage conservation projects.
Training	Training in surveying, studying and evaluating built and urban heritage.

ARTS • CULTURE • DESIGN • SUSTAINABILITY

Contact details

Name	Arts - Culture - Design - Sustainability	 
Acronym	ACDS	
Logo		
Site		
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Telephone	+40-264-401843	
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Director	Assoc. Prof. PhD Arch. Dorina VLAD	
e-mail	dorina.vlad@arch.utcluj.ro , dorinavlad@yahoo.com	

Areas of expertise

Research and study in the field of :

- architecture and decorative arts, contemporary design – architectural design / object design;
- advances in architectural technology and design;
- sustainability – part of contemporary society development;
- research and study of rural and urban heritage and communities;
- exhibition organization and participation;
- education and improvement of the educational process.

Team

Assoc.Prof.PhD. Arch. Dorina VLA, D Assoc.Prof.PhD. Arch. Paul MUTICĂ, Lect.PhD.Arch. Adrian ARAMĂ, T.assist.PhD.Arch. Ana-Maria GRAUR, T.assist.PhD.Arch. Andreea MOȚU, PhD student Arch. Fabian LUCA.
External Collaborators: Arch. Lucian SIMU, Arch. Raluca GRAPA ROȘCA, Eng. Zsuzsanna PALL, Eng. LACZKO Csaba Eng. Călin ONIȘOR, Ioana BOGDAN CĂTĂNICIU.

Representative projects

Collaborations with institutions and organizations in the field of education, research and culture, economic units
Participation at Bucium 2017 Summer University, collaboration between FAU representatives and RPER-Romania Association "Rencontres du Patrimoine Europe-Roumanie"

2013-2016. Partnership agreements and cooperation conventions between:

F.A.U.P, T.U.C-N and SC Salice Comprod SRL – registration no. 49/07.03.2016,

Furniture Design Discipline (F.A.U.P, T.U.C-N) and Ratiu Center for Democracy – registration no. 25/ 05.02.2016-

Competition organization Outdoor Area "Object" Turda

Design Competition Guidance. Guidance for the student team - National Design Competition, BIFE-SIM International Furniture Fair, 2016. Outcome: Mention

Student Projects Competition Organization - C.A.S.A. (F.A.U.P., in collaboration with the Faculty of Architecture Timisoara, Faculty of Architecture Iasi) – 2nd year Architectural Design Studio Team , 2016

Organization of the International Workshop Roșia Montană [Albumus Maior], Alba County, partnership with ENSA Clermont Ferrand, UAIM Bucharest, French Institute of Cluj, 2016

F.A.U.P, T.U.C-N and SC Antares România SRL – registration no. 14/10.06.2015, Antares company representatives). Antares Contest Organization - "Creativity / Re-use",

F.A.U.P, T.U.C-N and The Open-Air Section of the Transylvanian Museum of Ethnography, registration no. 258/16.10.2015

F.A.U.P, T.U.C-N and The Astra National Museum Complex, Sibiu, registration no. Astra Sibiu 9337/18.11.2015

F.A.U.P, T.U.C-N and „Rencontres du Patrimoine Europe-Roumanie” RPER-România Association, „Rencontres du Patrimoine Europe-Roumanie” RPER – Franța – registration no. 5634 / 12.03.2014

Cultural project "The preservation of mountain population process through the rebuilding and cultural valorisation of a unique monument house in Țara Moșilor ", 2013. (Ethnographic Museum of Transylvania Cluj), (A. ARAMĂ)

Significant results

Books (2013-2017):

1. D.VLAD (coordinating editor), A.MOȚU (editor), project catalog „Etape. Mobilier pentru copii. Interior pentru tineri. Mobilier urban. Catalog de proiecte al studenților anului III. Proiectare specializată Mobilier – Facultatea de Arhitectură și Urbanism”,

ISBN 978-973-662-983-3 Cluj-Napoca: UTPRESS, 2014 • D.VLAD (coordinating editor), A.MOȚU, D.I.JULEAN (editor), „Stil. Istoria mobilierului. Caiet de studii nr. 3. Relevee de mobilier stil. Relevee de mobilier traditional", ISBN 978-973-662-823-8, Cluj-Napoca: UTPRESS, 2013;

2. P. MUTICĂ, „Antropologie Culturală", ISBN 978-973-662-869-6, Cluj-Napoca: UTPRESS, 2013;

Articles (2013-2017):

1. D.VLAD, A.MOȚU, F.LUCA, "Commercial spaces on display. City centers on display", Acta Technica Napocensis: Civil Engineering & Architecture, Special Issue – Questions International Workshop 2017 Vol. 60 No 3 (2017) 180-196;
2. P.MUTICĂ, "Two Decades of Evolution in Cluj-Napoca's Suburbs", ATINER, Territorial Identity and Development Panel as part of the 3rd International Conference on Geography, Athens, 4-7.06.2017, in „ATINER Conference Paper Series", Geo 2017-2311, ISSN 2241-2891, pp.1-21;
3. P.MUTICĂ, "Towards an Active Reuse of the Built Heritage in Roșia Montană - A Student's Exercise", Territorial Identity and Development International Conference, UBB, Cluj 2017, in Ulrich's Web „Territorial Identity and Development", CEEOL, vol. 1, nr. 2, ISSN 2537-4850, pp. 47-63;
4. A.ARAMĂ, „Fără titlu", Arhitect nr.1/ 249, 2016-2017, ISSN 1224-886x;
5. C.MARZA, G.CORSIUC, A.-M. GRAUR, "Applying The Theory Of The Plane In The Civil Engineering Field" International Conference On Engineering Graphics And Design, Icegd 2017, Journal Of Industrial Design And Engineering Graphics, ISSN 1843-3766;
6. D.VLAD, A.MOȚU, "Wooden Barrels and Textiles. An approach towards a sustainable design", Acta Technica Napocensis: Civil Engineering & Architecture vol 59, No. 3, (2016), Special Issue – Questions International Workshop „Buildings-Cities-Territory", pp.21-26, ISSN 1221-5848;
7. A.MOȚU, "A Semantic Analysis of Movement in Contemporary Architecture", 41st IAHS World Congress on Housing, „Sustainability and Innovation for the Future", Sept. 13-16, 2016, Albufeira, Portugal, ISBN 978-989-98949-3-8;
8. F. LUCA, "Diploma project: The Urban Path – Museum of the Copper Age, Deva", Arhitectura no. 3-4/ 2016, ISSN 2247 – 9171;
9. D. VLAD, A.MOȚU, "Sustainability - Education", Acta Tech. Napocensis: Civil Eng. & Arch., Vol. 58, No. 4 (2015) Special Issue – International Workshop, pp.102-109, ISSN 1221-5848;
10. K. SZABO, P.MUTICĂ, S.SZAMOSKOZI, "Associations Between HEXACO Model of Personality Structure, Motivational Factors and Self-Reported Creativity among Architectural Students", Psiworld 2014 International Conference, in „Procedia - Social and Behavioral Sciences", Elsevier Ltd., ISSN 1877-0428, vol. 187/2015, pp. 130-135;
11. A. ARAMĂ, „Extinctii si aparitii ... stari la periferia ratiunii sau imbolnavire de marginea timpului", Arhitect nr. 5 / 241, ISSN 1224-886x, 2015;
12. A.-M. GRAUR, "Geometry And Complexity In Architecture" International Conference On Engineering Graphics And Design, Icegd2015, Journal Of Industrial Design And Engineering Graphics, ISSN 1843-3766;
13. A. ARAMĂ, „Tehnologia abatorului vernacular / exercițiu politic, gastronomic și arhitectural în casa morților vii", Conexiuni Arhitect, summer 2014 / no 2, ISSN 1224-886x,
14. A.-M. GRAUR, "Structural Form In Architecture Of The 20st And 21st Century Based On Warped" International Conference On Engineering Graphics And Design, Icegd 2013, Ed. Politehnica, ISSN 1224-6042.

Participation in exhibitions (2013-2017):

A.ARAMĂ : Selfie Automaton, National Museum of Contemporary Art, Bucharest, dec. 2017-jan.2018 (team member) • Selfie Automaton, Muzeum Speelklok / Utrecht, Netherlands, apr.-sept 2017 (team member), 2017 • cover, portfolio, invitation Architect's Ball 2017, drawings published in Timpul magazine • Biennial Exhibition of Miniature Art Timisoara, 2016 • Winter Exhibition of UAP Cluj - Art Museum Cluj-Napoca, 2015.

A.-M. GRAUR: Personal Painting Exhibition-„The deconstruction of industrial architecture. Social reconstruction through culture“-Casa Matei, 2014.

Organization of exhibitions: "Community center in Cojocna" - in partnership with Cojocna Gymnasium School (within the Scoala Altfel Program) and Cojocna City Hall, 2017, coordinator: D.VLAD • Exhibition organization Antares Competition Fourth Edition - Phase I (within ZA 2015, may 2015), Phase II (Antares Showroom)-2015, Phase II, „Romulus Ladea" Fine Arts High School – 2015 (D.VLAD, A.MOȚU, A.ARAMĂ)

Prizes, nominations and selections for national competitions:

Dorina VLAD – Ascanio Damian Research Award, 2005

Adrian ARAMĂ – The Romanian Pavilion at the Venice Architecture Biennale, 2016 (member within a group)

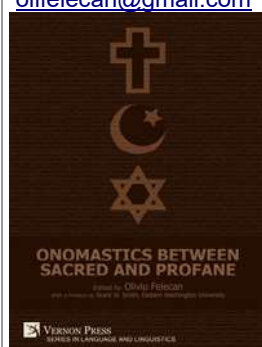
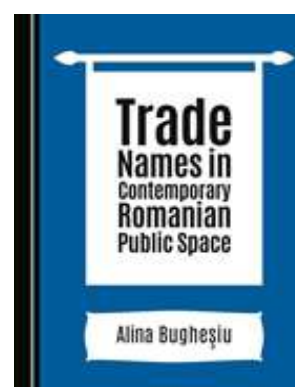
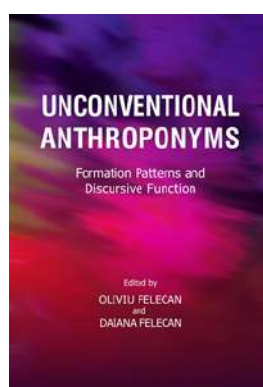
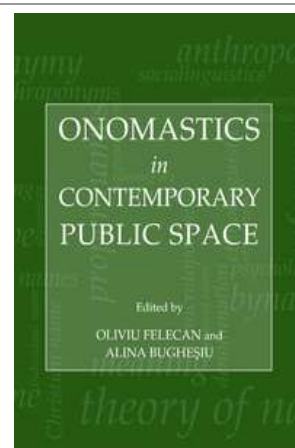
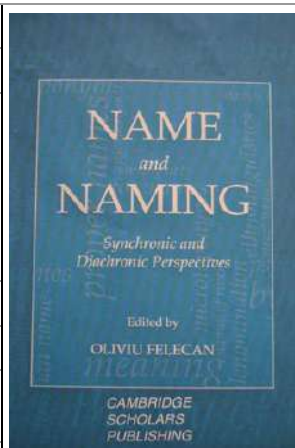
The offer addressed to the economic environment

Research & development	Studies and collaborations with economic, educational, cultural and administrative institutions and organizations regarding architecture and decorative arts, contemporary design, architectural technology; Studies - investigation and identification of sustainable development directions for local communities (in collaboration with other institutions, organizations, research groups); Rural and urban heritage and communities – identification and research of architectural, natural, social, cultural values and their current development; Involvement of the economic organizations in the academic process, exhibition organization and participation; collaborations with other educational partners.
Consulting	• Assoc.Prof. PhD. Arch. D. VLAD: CNMC (Comisia Nationala a Muzeelor si Colectiilor – Museums and Collections National Committee) certified expert for meaningful artistic goods-furniture. • Assoc. Prof. PhD. Arch. P. MUTICĂ: BLETJ Cluj (Local Bureau for Technical and Judicial Expertise for Cluj) judicial expert with the Tribunal of Cluj County
Training	Competition organization, exhibitions, study visits – their aim is to create a link between the university (FAUP) and the economic or cultural environment (collaborations with museums, private cultural organizations)

CENTER OF ONOMASTICS

Contact details

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Acronym	CO
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Areas of expertise

Domain: philology, humanities (onomastics, socio-/psycho-/ethnolinguistics, anthropological linguistics, pragmatics). Philology can be defined as the scientific knowledge of the entire activity and life of a certain people, in a given period of its existence. As a sub-field of philology, linguistics studies human language, exploring its mechanisms by means of comparative, synchronic and diachronic studies of languages.

Team

Prof. Dr. Hab. Olaviu Felecan, Assoc. Prof. Dr. Hab. Daiana Felecan, Dr. Alina Bugheșiu, Assoc. Prof. Mihaela Munteanu-Siserman, Dr. Adelina Mihali

Representative projects

"Multiethnic Connections in the Anthroponymy of Maramureș, a Central European Area", IDEI, (2009)
 "Onomastics in Contemporary Romanian Public Space: Socio- and Psycholinguistic Research", TE grant, (2012)
 "Unconventional Romanian Anthroponyms in European Context: Formation Patterns and Discursive Function", TE grant, (2011)

Significant results

Books:

1. O. Felecan, *Onomastics between sacred and profane*, Wilmington: Vernon Press, 2019, 434 p
2. D. Felecan, *Întâlnire cu semnele textului. 18 popasuri de lectură critică*, București: Editura Academiei Române, 2018.
3. O. Felecan, *Proceedings of the Fourth International Conference on Onomastics "Name and Naming". Sacred and Profane in Onomastics*, Cluj-Napoca: Editura Mega, Editura Argonaut, 2017, 1255 p.
4. A. Bugheșiu, *Trade Names in Contemporary Romanian Public Space*, 2015, 259 pages
5. A. Mihali, *Toponymy of the Maramureș County. The Superior Valley of the Vișeu River*, 2015, 255 pages
6. M. Munteanu Siserman, *Names and Senses: Semantic Correspondences in Onomastic Configurations*, 2015, 200p
7. O. Felecan, *Proceedings of the Third International Conference on Onomastics "Name and Naming". Conventional/Unconventional in Onomastics*, 2015, 1010 pages
8. D. Felecan, *Pragmatics of Unconventional Names and Naming: From Theoretical Paradigms to Discursive Practices*,

2014, 302 pages

9. O. Felecan, D. Felecan, *Unconventional Anthroponyms: Formation Patterns and Discursive Function*, 2014, 536 p.
10. O. Felecan, A. Bugheșiu, *Onomastics in Contemporary Public Space*, 2013, 639 pages
11. O. Felecan, *Proceedings of the Second International Conference on Onomastics "Name and Naming". Onomastics in Contemporary Public Space*, 2013, 1115 pages
12. O. Felecan, *An Onomastic Excursion into Contemporary Romanian Public Space*, 2013, 206 pages

Studies:

1. O. Felecan, *Oikonymic transformations in Romania in the first half of twentieth century*, în „Dacoromania”, XXIV, nr. 1/2019, p. 57-65.
2. O. Felecan, N. Felecan, *Toponymic Homonymies and Metonymies: Names of Rivers vs Names of Settlements*, în „Onomastica. Anuari of the Societate d'Onomastica”, nr. 5/2019, p. 91-114.
3. O. Felecan, *Transylvania - A Toponymic Perspective*, în „Onomastica Uralica”, nr. 12/2018, p. 289-299.
4. A. Bugheșiu, *Imaginative Names for Imaginary Friends*, în *British and American Studies*, 24, 2018, p. 227-236.
5. Felecan, Oliviu, *Man of word*. In honorem Gheorghe Chivu PHILOLOGICA JASSYENSIA Volume: 13 Issue: 2 Pages: 302-303 Published: 2017
6. Felecan, Oliviu, *Oikonymic Transformations in Romania in the Second Half of the Twentieth Century NAMES-A JOURNAL OF ONOMASTICS* Volume: 65 Issue: 2 Pages: 78-87 Published: 2017
7. D. Felecan, O. Felecan, „Nicknames of Romanian Politicians after 1989, în *Philologica Jassyensia*”, an XII, nr. 2 (24), 2016, *ALTERNATIVES*, Vol.24, nr.2, pp.191-207, 2016.
8. D. Felecan, A. Bugheșiu, „Să nu [în]juri strămb...”. Înjurături românești care conțin antroponime (II): niveluri constitutive și semantic-referențiale, în „Philologica Jassyensia”, *ALTERNATIVES*, Vol. 1(23), nr.1(23), pp.47-55, 2016.
9. O. Felecan, N. Felecan, „Denumiri ale băuturilor spirtoase tradiționale românești”, *Dacoromania*, Vol.1, nr.XXI, pp.46-59, 2016.
10. M. Munteanu Siserman, „DE QUELQUES STRUCTURES LINGUISTIQUES DES LANGUES SPÉCIALISÉES”, *Acta Technica Napocensis*, Vol.16, nr.4, pp.93-102, 2016.
11. O. Felecan, A Psycholinguistic, „Approach to Nicknaming (With Reference to Nicknames Given by Students to Teachers)”, *The 25th International Congress of Onomastic Sciences*, Glasgow, Vol.3, pp.65-81, 2016.
12. D. Felecan, A. Bugheșiu, „Anthroponyms in Taboo Discourse: The Case of Romanian Swear Phrases”, *25th International Congress of Onomastic Sciences*, 25th - 29th August, 2014, Glasgow, Marea Britanie, Vol.4, pp.21-32, 2016.
13. O. Felecan, „Borders and Ethnic Identities Reflected in Street Names from Transylvanian Localities”, in *Transylvanian Review*, (ISI) vol. XXIV, Supplement nr. 1/ 2015 Regionalization in Globalization, pp. 229-244.
14. D. Felecan, A. Bugheșiu, „Swear Not at All”-Romanian Anthroponym-Based Expletives (I): Theoretical Sketches”, in *Philologica Jassyensia* (ISI), Nr. 2 (22)/ 2015, pp. 57-67.
15. A. Bugheșiu, „Romanian Brand Names as Cultural Mediators”, in *Names in the Economy: Cultural Prospects*, 2013, pp. 73-88
16. D. Felecan, „Aspetti della cortesia e della scortesia verbale nei dibattiti e nei comunicati stampa televisivi (il caso della campagna elettorale presidenziale della Romania, 2009)”, vol. VI, in *Actas del XXVI Congreso Internacional de Lingüística y de Filología Romanicas*, Valencia, 2010, Berlin, Walter de Gruyter, 2013, pp. 463-474
17. O. Felecan, „Il contatto linguistico romeno-romanzo attuale, riflesso nell'antroponimia”, in *Emili Casanova Herrero, Cesáreo Calvo Rigual* (eds.) *Actas de 26º Congreso Internacional de Lingüística y de Filología Románicas, Valencia 2010*, Berlin/ Boston: De Gruyter, 2013, vol. V, Sección 6: Descripción histórica y/o sincrónica de las lenguas románicas: onomástica (toponimia y antroponimia), pp. 123-134
18. D. Felecan, „Nume proprii și denotații propriale, între monovalență și polifonie (Abordare pragmatolingvistică)”, in *The Proceedings of the European Integration – Between Tradition and Modernity Congress* (ISI), vol. 5, 2013, pp. 306-316
19. O. Felecan, „Licensed Unconventional Anthroponyms in the Age of European Integration The Case of Number Plates”, in *Proceedings of the European Integration – between Tradition and Modernity Congress* (ISI), Târgu-Mureș, Editura Universității „Petru Maior”, Volume Number 5, 2013, pp. 445-455
20. M. Munteanu Siserman, „Names of Autochthonous Dishes in Relation to Globalisation (Onomastic and Sociocultural Approaches)”, in *Proceedings of the European Integration – between Tradition and Modernity Congress* (ISI), Târgu-Mureș, Editura Universității „Petru Maior”, Volume Number 5, 2013, pp. 431-443
21. A. Mihali, „Aspects of Identity and Alterity in the Names of Romanian Public Space. Ukrainian community from Maramureș” in *Acta onomastica*, LIV, 2013, Praga, pp. 205-216

The offer addressed to the economic environment

Research & development	Research and development in the field of philology is mainly achieved with the help of humanities. Sociolinguistics, psycholinguistics, ethnolinguistics, and anthropological linguistics can help improve the economic environment theoretically. Through the interdisciplinary nature of the projects undergone within the Center of Onomastics, our teamwork could be employed in other fields, such as sociology, psychology, economy, marketing, advertising etc.
Consulting	Consulting may regard the choice of an appropriate name for businesses, which should be tightly connected to the impact that such institutions perform in society, but also the correct usage of Romanian in the direct relationship with customers, or the one established (indirectly) by means of websites and advertisements. At the same time, we could offer consulting for the organization of international scientific events and for editing scientific journals.



RESEARCH PUBLICATIONS





ISI PUBLICATIONS - 2019

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RESEARCH PATENTS





LIST OF PATENTS

1. PATENT EPO NR. EP3300462-B1 / 11.12.2019

TITLE RO/EN: Structura de condensatoare pentru circuit de curent continuu / CAPACITOR DIRECT CURRENT (DC)-LINK ARRANGEMENT FOR HIGH CURRENT RIPPLE APPLICATIONS, HAS CERAMIC CAPACITOR ELEMENTS THAT ARE ARRANGED AND CONNECTED IN SIMILAR CURRENT PATH AND IN PARTICULAR IN SAME RESISTANCE CURRENT PATH

INVENTOR(S): TEODOSESCU PETRE DOREL, VINTILOIU IOANA, POP ADRIAN CORNEL, RUSU TIBERIU, POP-PIGLESAN FLORIN-ADELIN, DARAMUS MIHAI-ALEXANDRU

ABSTRACT: The arrangement (1) has a first terminal (2) and a second terminal (3) that are arranged on a printed circuit board (PCB) based substrate (5) Several ceramic capacitor elements (4) are connected to the first terminal and the second terminal. The ceramic capacitor elements are arranged and connected in a similar current path and in particular in the same resistance current path. The first terminal and the second terminal are split into a first path (7,7') and a second path (8,8') to form a portion of a corresponding contact area (6,6'). **USE** - Capacitor direct current (DC)-link arrangement for high current ripple applications, power conversion systems and electronic converters. **ADVANTAGE** - The mechanical properties of the capacitor DC-link arrangement are significantly improved. The capacitor portion damages are prevented or significantly reduced due to application in high vibration environments. The load symmetry of the ceramic capacitor elements is achieved. The cracking vibration immunity of the capacitor bank is achieved by special arrangement of the ceramic capacitor elements together with placing of the strengthening bus bars on the positive and negative copper paths.

2. PATENT OSIM NR. RO128582 -B1 / 29.11.2019

TITLE RO/EN: Dispozitiv pentru conversia zgomotului in energie electrica / DEVICE FOR CONVERSION OF NOISE TO ELECTRIC ENERGY CONSISTS OF A SUPPORT WHICH SUPPORTS A COLLECTING MATRIX, WITH SOME ELECTROMAGNETIC AND PIEZOELECTRIC TRANSDUCERS

INVENTOR(S): FILIP NICOLAE

ABSTRACT: The invention relates to an acoustic-electric device meant to collect the environmental noise made by the road traffic or by various technological equipments and to convert the same into low-power electric energy. According to the invention, the said device consists of a support (1) which supports a collecting matrix (2), with some electromagnetic and piezoelectric transducers (3), which convert the acoustic energy into electric signals, which are collected by means of some connections (4) and a multichannel system (5) to an accumulator (6), or to a consumer; the collecting matrix (2) comprising 11 transducers (3), each being provided with a convergence element (7), geometrically differentiated depending on the central frequency.

3. PATENT OSIM NR. RO131458 -B1 / 30.10.2019

TITLE RO/EN: Sistem de amplificare pentru presiuni inalte / AMPLIFICATION SYSTEM FOR HIGH PRESSURES consists a sonic generator (1) comprising a shaft

INVENTOR(S): CIUPAN CORNEL, CIUPAN EMILIA, PETRUS RARES ADRIAN

ABSTRACT: The invention relates to an amplification system for high pressures, which can be used in the construction of water-jet cutting machines or in other industrial applications requiring high pressures. According to the invention, the system consists of the following components: a. a sonic generator (1) comprising a shaft (4) with a cam or an eccentric (5) which, by a rod (6), actuates a membrane (7) of a membrane chamber (8), the membrane (7) being fixed with some screws (11), between a lower casing (9) and an upper casing (10); b. a sonic amplifier (3) made of a membrane chamber (12) having the membrane (13) coupled, by a rod (14), to a membrane (15) of a membrane chamber (16), where the membrane (13) is fixed by screws (17) between an upper casing (18) and a lower casing (19), the membrane (15) is fixed between the lower casing (19) of the chamber (12) and the casing (20) of the membrane chamber (16), by some screws (21), generating pressure waves in a liquid-containing flexible pipe (2) made of insertion rubber, or a rigid pipe made of metal, the pressure waves generating a reciprocating motion of the membrane (13), the connecting rod (14) generating the reciprocating motion of the membrane (15), the membrane chamber (16) together with the supply valve (22) and a nozzle (23) mounted on an orifice (24), by means of a threaded bush (25), making up the high-pressure pump (26) which generates the pulsating jet whose frequency is equal with the frequency of the pressure waves within the pipe (2); the pressure amplification is achieved due to the fact that the membrane (13) has a diameter (D) larger than the diameter (d) of the membrane (15), the pressure amplifying ratio being given by the square of the ratio between the diameters (D/d)².

4. PATENT OSIM NR. RO130017 -B1 / 30.09.2019

TITLE RO/EN: Dispozitiv optico-electric cu marcate fiduciale pentru interfatarea cu sisteme tactile optice multi-punct / OPTO-ELECTRICAL DEVICE WITH FIDUCIAL MARKS FOR INTERFACING WITH MULTI-POINT TOUCH OPTICAL SYSTEM

INVENTOR(S): CRISAN SEPTIMIU

ABSTRACT: The invention relates to an opto-electrical device with fiducial marks meant for man-machine interfacing in multi-user multi-point touch systems carried out with optical methods and which have characteristics and behaviours similar to the real objects generally found on the frontal panel of an apparatus, such as press buttons, displays, control elements. According to the invention, the device comprises a mechanical support (1) adapted to the size of a human hand, which comprises a matrix (2) of visible or infrared punctiform sources, supplied from a mobile voltage source (3), a guiding grid (4) which together with the matrix (2) allows the manufacture of optical marks, a series of slots (5) for detecting the incident light radiation, a photoelectric transducer assembly (6) which detects the light radiation and controls the selective switching on of the sources forming a fiducial mark, a pressure sensor (7) which permits the decrease of the energy consumption and the detection of the interaction between the user and the device, a switch (8) for starting the device and a plate (9) for diminishing parasite reflections.

5. PATENT OSIM NR. RO129923 -B1 / 30.08.2019

TITLE RO/EN: Modul de orientare cu structura modulara cu mai multe curburi / MODULE OF ORIENTATION WITH MODULAR STRUCTURE, HAVING VARIOUS CURVATURES, INTERMEDIATE ELEMENT AND ELEMENT FOR CHANGING CURVATURE

INVENTOR(S): VAIDA LIVIU CALIN, PLITEA NICOLAE, PISLA DOINA LIANA, GHERMAN BOGDAN GEORGE, SUCIU MARIUS CRISTIAN

ABSTRACT: The invention relates to a module of orientation of the distal end of a surgical instrument. According to the invention, the module comprises a plurality of elements (1a, 1b and 1c), i.e. an end element, an intermediate element and an element for changing the curvature, which allow the carrying out of some structures of orientation having various curvatures that can have various inclination angles determined by the number of intermediate elements (1b) and by the value of an angle, with the possibility of obtaining several curvatures whose orientation in relation to one another is defined by the value of an angle and which can have various diameters (d) and lengths (L).

6. PATENT OSIM NR. RO128979 -B1 / 30.07.2019

TITLE RO/EN: Procedeu si instalatie de separare electrostatica a unui amestec de materiale granulare neconductive / PROCESS AND INSTALLATION FOR ELECTROSTATICALLY SEPARATING A MIXTURE OF NON-CONDUCTIVE GRANULAR MATERIALS

INVENTOR(S): SAMUILA ADRIAN PAUN, BILICI MIHAI-ALEXANDRU, IUGA ALEXANDRU-IULIU, DASCALESCU LUCIAN DORUCALIN FLORENTIN LAUR

ABSTRACT: The invention relates to a process and an installation for electrostatically separating the components of a mixture of non-conductive granular materials, such as: wastes of plastic, mineral substances and others. According to the invention, the process consists in: introducing, with an adjustable supplying flow rate, a mixture comprising non-conductive granules of various types, into a triboelectrization region, electrically charging with contrary sign charge the two components the granular mixture consists of, by triboelectrization in fluidized bed, separating the non-conductive granules of the first type from those of the second type by displacing them in opposed directions, under the action of some forces exercised by an electrostatic field, fastening the granules of the first type on the surface of a non-conductive rotating cylinder and those of the second type on another non-conductive rotating cylinder, extracting, from the triboelectrization area, the electrically charged granules which are fastened on the two cylinders, by rotating the same in opposite directions, detaching the granules from the surface of the two cylinders, under the action of the weight force or by means of some cleaning brushes and collecting them as products of the separation process and discharging, from the triboelectrization area, the mixture of the granules which cannot be separated. As claimed by the invention, the installation comprises an air chamber (10) made of some identical modules (11) for dividing and configuring the fluidized bed, an area (1) for triboelectrization in fluidized bed common with an area of electrostatic field generated by two electrodes (3 and 4) each connected to a high voltage source (5 and 6) of positive and negative polarity, respectively, two non-conductive rotating cylinders (7 and 8) associated to the two electrodes (3 and 4), two brushes (9) providing the granule detachment from the rotating cylinders (7 and 8), two granule collectors (15) and a third collector (16) of insufficiently electrized granules.

7. PATENT OSIM NR. RO131169 -B1 / 28.06.2019

TITLE RO/EN: Dispozitiv electronic pentru sisteme de iluminat cu LED / ELECTRONIC DEVICE FOR LED LIGHTING SYSTEMS

INVENTOR(S): TEODOSESCU PETRE DOREL, SABAU MADALINA SABINA, NORBERTY CSABA SZEKELY, BOJAN MIRCEA, MARSCHALKO RICHARD

ABSTRACT: The invention relates to an electronic device for controlling light emitting diodes - LED used in lighting systems. According to the invention, the device comprising a single electric energy conversion stage, without rectifier circuit on the input side, consists of an input filter (1), an alternating current converter (2), which consists of a capacitive divider (6) and a half-bridge electronic circuit (7) comprising two bidirectional electronic devices (8), enabling the direct connection to an alternating voltage source and the generation, at the output, of high frequency alternating voltage signals, which supply a resonance circuit LC (3), a LED load (4) and a control circuit (5) generating control signals for the converter (2).

8. PATENT OSIM NR. RO128666-B1 / 29.11.2018



TITLE RO/EN: Traductor electronic analogic pentru masurarea puterii in curent continuu / ANALOGUE ELECTRONIC TRANSDUCER FOR MEASURING POWER IN DIRECT CURRENT CIRCUITS, HAS CIRCUIT FOR GENERATING FILLING FACTOR WHICH IS ASTABLE FLIP-FLOP CIRCUIT BASED ON AMPLIFIER

INVENTOR(S): MUNTEANU RADU ADRIAN, DULF EVA HENRIETTA, FESTILA CLEMENT, MUNTEANU RADU, TODORAN GHEORGHE-ION

ABSTRACT: The invention relates to an analogue electronic transducer used for measuring power in direct current circuits. According to the invention, the transducer consists of a circuit for generating the filling factor which is an astable flip-flop circuit based on an amplifier (A2) with positive reaction through two resistors (R1 and R2) but also with negative reaction through two diodes (d1 and d2), two equivalent controlled resistors (r1 and r2) and a capacitor (C), the equivalent resistors (r1 and r2) corresponding to some bipolar transistors from two oppositely-connected optocouplers, the output voltage of the differential amplifier (A2) controlling, in synchronism, two electronic switches (K1 and K2) connected with two low-pass filters (FTJ-1 and FTJ-2) which have the role of smoothing the rectangular waves generated by the switches (K1 and K2) and an amplifier (A1) which controls the current of the diodes (d1 and d2).

9. PATENT OSIM NR. RO131325-B1 / 30.10.2018

TITLE RO/EN: Metoda chimica de obtinere a filmelor epitaxiale de manganit de lantan dopat cu strontiu $\text{La}_{0.66}\text{Sr}_{0.33}\text{MnO}_3$ (LSMO) / CHEMICAL METHOD FOR PREPARING EPITAXIAL FILMS OF STRONTIUM-DOPED LANTHANUM MANGANITE $\text{La}_{0.66}\text{Sr}_{0.33}\text{MnO}_3$ (LSMO)

INVENTOR(S): NASUI MIRCEA, PETRISOR TRAIAN, MOS RAMONA BIANCA, MESAROS AMALIA, GABOR MIHAI SEBASTIAN, CIONTEA LELIA, PETRISOR TRAIAN

ABSTRACT: The invention relates to a chemical method for preparing epitaxial films of strontium-doped lanthanum manganite $\text{La}_{0.66}\text{Sr}_{0.33}\text{MnO}_3$, meant to be used in magnetic field sensors. According to the invention, the method consists in preparing a precursor solution by mixing metal sources, such as lanthanum acetylacetonates, manganese and strontium acetate which are separately dissolved in propionic acid, the resulting precursor solution being then concentrated by vacuum distillation, up to a concentration of 1...2 M, after which it is deposited by centrifugation onto SrTiO_3 monocrystalline substrates, at rotary speeds of 4000 rpm, for 60 s, the raw films being further subjected to a one-stage heat treatment, in air, at a heating rate of 5 degrees C/min, up to the temperature of 500 degrees C and a heating rate of 10 degrees C/min, up to the temperature of 1100 degrees C, they being maintained at this temperature for 2 h, after which they are cooled down to the ambient temperature at a rate of 10 degrees C/min, the resulting films exhibiting an advanced orientation degree.

10. PATENT OSIM NR. RO131110-B1 / 28.09.2018

TITLE RO/EN: Sistem janta cu motor electric incorporat pentru vehicule electrice / RIM WITH BUILT-IN ELECTRIC MOTOR SYSTEM FOR ELECTRIC VEHICLES

INVENTOR(S): JURCA FLORIN NICOLAE, RUBA MIRCEA

ABSTRACT: The invention relates to a system comprising a rim with built-in electric motor meant for electric vehicle propulsion. According to the invention, the system consists of two main elements: a rim and an electric motor, the rim consisting of an outer ring (1) made of non-magnetic materials, on which the tire is fixed, some outer covers (2), also made of non-magnetic materials, an inner disk (3) which has a double role: of fixing some modular rings (4 and 5), i.e. exterior and interior, respectively, and of fixing the system on the vehicle, the modular rings (4 and 5) providing, in their turn, the attachment of the motor magnetic cores made of modular elements (6 and 7), the electric motor being a motor with switched reluctance, in reversed construction, consisting of a rotor (8) made of electrotechnical-grade steel sheets in modular shape, and of a stator (10) made of modular magnetic poles also made of steel sheets, on which the electric circuit made of coils (12) wound about the salient poles is placed.

11. PATENT OSIM NR. RO131166-B1/ 30.08.2018

TITLE RO/EN: Actuator electromecanic cu dispozitiv electronic de comanda / ELECTRO MECHANICAL ACTUATOR WITH ELECTRONIC CONTROL DEVICE, MEANT FOR ROTARY ACTUATION OF ANY ELEMENT OR EQUIPMENT WHICH NEEDS MAXIMUM ANGULAR ROTATION

INVENTOR(S): BREBAN STEFAN, TEODOSESCU PETRE DOREL, NEAG ADRIANA VOICA, CHIRCA MIHAI

ABSTRACT: The invention relates to an electro-mechanical actuator with electronic control device meant for rotary actuation of any element or equipment which needs a maximum angular rotation of 180 degrees. According to the invention, the actuator consists of a rotor having one or more permanent magnets (9) with radial magnetization, mounted by means of a bush (18) clamping or adhered onto an axle (8) which is mounted on two bearings (7) each of them integrated into a plate (5, 6) of a material of high magnetic permeability, of windings (3) which are placed about some statoric poles (2), which are located on either side of the magnet/magnets (9) on the rotor and are mounted on some supports (4) of a high permeability material, fixed on the ends of the plates (5, 6) to form together a rigid assembly, of a circular torsion spring (16) mounted about the axle (8) of the rotor, the spring (16) having one end fixed on one of the plates (5, 6) and the

other end fixed, through a connection element (13) to the axle (8) of the rotor, and of an electronic device which provides the winding supply and, implicitly, the rotor movement between two standing positions.

12. PATENT OSIM NR. RO127032-B1 / 30.05.2018

TITLE RO/EN: Dispozitiv de pornire la rece a motoarelor cu ardere internă alimentate cu biodiesel / COLD START DEVICE FOR INTERNAL COMBUSTION ENGINES SUPPLIED WITH BIODIESEL FUEL

INVENTOR(S): MARIASIU FLORIN EMIL, BURNETE NICOLAE, VARGA BOGDAN OVIDIU

ABSTRACT: The invention relates to a cold start device for an internal combustion engine supplied with biodiesel fuel. According to the invention, the device has a system (1) for emitting ultrasounds (2) that are transmitted by means of an emitter (3) directly into the biocombustible mass from a filtration battery, thereby producing an increase of the temperature thereof, the system (1) for emitting the ultrasounds (2) being controlled by means of a control module (4) depending on the temperature necessary to obtain the optimal physical parameters (viscosity, density) of the biofuel, the temperature being measured by a sensor (7) placed on the case (5) of the filtration battery.

13. PATENT OSIM NR. RO127277-B1 / 30.05.2018

TITLE RO/EN: Metoda de generare a structurilor cinematice pentru roboti paraleli, si structura reconfigurabila obtinuta / MODULES FOR RECONFIGURATION OF PARALLEL ROBOTS, HAVE PAIR OF COMBINATIONS OF LINKAGES, LINKAGE HAS SPHERICAL JOINT, PRISM-SHAPED JOINT AND UNIVERSAL JOINT

INVENTOR(S): BRISAN CORNEL

ABSTRACT: The invention relates to a method for obtaining, by reconfiguration, a system of parallel robots having various mobility degrees and to some modules necessary for such a reconfiguration, respectively. According to the invention, the method consists, in a first stage, in selecting the number of mobility degrees (M) of a robot, then selecting the number (b) of linkages of PSR type so that, finally, a number (a) of linkages of PSU type results based on the relation $M=a+b$, the reconfigurability of the structures being ensured by using the same mounting dimensions between the connection elements of some kinematic couples. The modules claimed by the invention have two combinations of linkages: a linkage (SPU) comprising three joints (1, 2 and 3), namely a spherical joint, a prism-shaped joint and a universal joint, and a linkage (SPR) comprising three joints (4, 5 and 6), namely a spherical joint, a prism-shaped joint and a rotation joint, where a reconfigurable joint can integrate only SPR linkages, only PSU linkages or combinations of PSR and PSU linkages, the linkages of the same type in a structure being identical.

14. PATENT OSIM NR. RO128489-B1 / 27.04.2018

TITLE RO/EN: Dispozitiv de sedimentare pentru obtinerea unor materiale poroase, sinterizate, graduale / PROCESS AND DEVICE FOR PREPARING SINTERED MATERIALS OF GRADUAL POROUS STRUCTURE BY GRAVITATIONAL SETTLING OF POWDERS

INVENTOR(S): VIDA-SIMITI IOAN, THALMAIER GYORGY, MOLDOVAN VALENTIN, SECHEL ARGENTINA NICULINA, NASCA OVIDIU

ABSTRACT: The invention relates to a process and a device for preparing sintered materials of gradual porosity by gravitational settling of powders, intended to be used as filtering elements or porous membranes for various industrial and medical applications. According to the invention, the process consists in previously dispersing the metallic powder mass into distilled water, after which it is poured into the settling enclosure (2) containing distilled water and a dispergation agent, the settling taking place inside a mould (6), then the settled material is dried in an oven, for 1 h, at a temperature of 110 degrees C, and sintered in sintering furnaces at technological parameters depending on the nature of the sintered material and the desired sintering degree. The device, as claimed by the invention, consists of four settling enclosures in the form of glass columns (2) which are fixed and sealed between the lower cap (3) and the upper cap (4), and four moulds (6) with water draining orifices.

15. PATENT OSIM NR. RO130282-B1 / 30.03.2018

TITLE RO/EN: Metoda pentru modificarea dinamica a frecventei intr-o unitate aritmetica bazata pe detectia on-line a erorilor / METHOD FOR DYNAMICALLY MODIFYING FREQUENCY IN AN ARITHMETIC UNIT BASED ON ONLINE ERROR DETECTION

INVENTOR(S): JOAN FIGUERAS PAMIES, MICLEA LIVIU CRISTIAN, MOIS GEORGE DAN

ABSTRACT: The invention relates to a method for dynamically modifying the frequency during the operation of an arithmetic unit within a digital signal processing unit which has adders or multipliers comprised in the critical path. According to the invention, the method consists in dynamically modifying the frequency by the dynamic modification of the clock signal period in an arithmetic circuit (1), based on the detection of the errors due to the delays occurred in the circuit, by a detection contention circuit, using a base 7 residual code.

16. PATENT OSIM NR. RO128900-B1 / 28.02.2018



TITLE RO/EN: Dispozitiv de atenuare a vibratiilor, atasat pe sistemul mana-brat al operatorului uman / DEVICE FOR DAMPING THE VIBRATIONS, ATTACHED TO THE HAND-ARM SYSTEM OF THE HUMAN OPERATOR

INVENTOR(S): POP AURORA FELICIA, ARGHIR MARIANA

ABSTRACT: The invention relates to a device for damping the vibrations, attached to the hand-arm system of the human operator. The device claimed by the invention consists of a support plate (3) which sustains a rubber sleeve (2) consisting of two parts secured at the ends with two screws (1), the plate (3) having the role of securing to the forearm, a vibration damper (6) secured between the plate (3) and another support plate (7) secured in another sleeve (9) by means of a screw (8), the vibration damper (6) being secured with an end to the plate (3) by means of a countersunk screw (4), and at the opposite end it is secured to the plate (7) by means of a support extender (5) which is welded to the plate (7).

17. PATENT OSIM NR. RO128681-B1 / 30.01.2018

TITLE RO/EN: Amplificator de impulsuri bipolare de curent in punte hibrida cu comanda simetrica / BIPOLAR CURRENT PULSE AMPLIFIER IN HYBRID BRIDGE WITH SYMMETRICAL CONTROL

INVENTOR(S): ARSINTE RADU, PETREUS DORIN- MARIUS

ABSTRACT: The invention relates to a bipolar current pulse amplifier in hybrid bridge with symmetrical control. According to the invention, the amplifier has a bridge structure consisting of four switch elements (Q1, Q2, Q5, Q6) and some circuits related thereto and it is meant to supply current pulses on an inductive load (L), two of the bridge sides, comprising switch elements (Q1 and Q5), are replaced with some linear current sources made by some high speed operational amplifiers (X1 and X2), some resistors (R5 and R12) being used for detecting the current of those sources and providing the current reaction, and some resistors (R6 and R13) providing the factor for amplifying in current, a voltage comparator made by some transistors (Q3 and Q4) and some additional elements (R15, R16 and R17) provide the control of the switch elements (Q2 and Q6) in the bridge, some elements (R3, R4, C2 and R11, R10, C4, respectively) are used for controlling the power switches (Q2 and Q6, respectively), in the bridge, and some diodes (D1, D2, D3 and D4) are used for suppressing the energy appearing during the switching process, the sense of the current in a load (L1) being set out by the transistors (Q3 and Q4) which are used for comparing the voltages at the output of the amplifiers (X1 and X2) and decide the activation of one of the two switches (Q2 or Q6).

18. PATENT OSIM NR. RO127341-B1 / 30.01.2018

TITLE RO/EN: Metoda si arhitectura hardware pentru adresarea automata a imaginilor microarray / METHOD AND HARDWARE ARCHITECTURE FOR AUTOMATIC MICROARRAY IMAGE ADDRESSING

INVENTOR(S): BELEAN IOAN BOGDAN, BORDA MONICA ELENA, TEREDES ROMULUS, MALUTAN RAUL EMIL

ABSTRACT: The invention relates to a method and hardware architecture for automatic microarray image addressing. The claimed method consists in determining a horizontal profile and a vertical profile of the image, applying a shock filter model and determining some points of inflection and tracing some pairs of horizontal and vertical lines allowing the selection and location of spots, eliminating the necessity of a workstation and a specialized software platform. The claimed hardware architecture consists in storing the horizontal and vertical profiles of the microarray image in a block RAM memory (8) using two information displacement registers (10 and 11) and a parallel processing block with two output registers (14 and 15) and dividing the profile data structure into blocks of size n, the same as the size of displacement registers (10 and 11), for uploading the data in the memory (8) into the displacement registers (10 and 11), passing and processing thereof by output registers (14 and 15) and storing the results in a RAM memory (9).

19. PATENT OSIM NR. RO 128372-B1 / 29.11.2017

TITLE RO/EN: Instalatie cu agitare pentru bioextractia metalelor grele din solurile poluate / INSTALLATION WITH STIRRING BY SWINGING FOR HEAVY METALS BIO-EXTRACTION FROM POLLUTED SOILS

INVENTOR(S): CIOCIORHAN CAMELIA SIMONA, MICLE VALER, ARDELEAN IOAN

ABSTRACT: The invention relates to an installation for extracting heavy metals from polluted soils. According to the invention, the installation consists of a cylindrical tank (7) supported on two rolling bearings and driven into a swinging-type oscillation movement, by means of a crank-equalizer-like quadrangle mechanism (2, 3, 4, 5, 6), a vat (8) with water, a gearmotor (1) and a system (10) for heating and temperature control, which, by means of a resistor of 1000 W connected in circuit with a microprocessor-plate, determines and maintains a temperature of 50 degrees C in the vat and of 35 degrees C in the cylinder.

20. PATENT OSIM NR. RO 129834-B1 / 30.10.2017

TITLE RO/EN: Procedeu de obtinere a unui material compozit de frictiune cu baza fier / METHOD FOR OBTAINING IRON-BASED FRICTION COMPOSITE, E.G. FOR BRAKE PADS, INVOLVES SCREENING IRON, COPPER AND TITANIUM DIOXIDE POWDERS WITH PARTICLE SIZE LESS THAN 10 MICROMETERS, HOMOGENIZING BY GRINDING, COMPRESSING IN MOLD AND SINTERING

INVENTOR(S): MERIE VIOLETA VALENTINA, CANDEA VIOREL CONSTANTIN, POPA CATALIN OVIDIU, POPA ANGELA ENUTA

ABSTRACT: The invention relates to a process for obtaining an iron-based friction composite material intended for car brake pads or other industrial friction applications. The process according to the invention starts by screening the iron, copper and titanium dioxide powders having a particle size of less than 10 microns, after which the powder mixture dosed according to the formula is homogenized by mechanical grinding for 15 minutes in a planetary ball mill having a plate rotary speed of 1000 rpm and a container rotary speed of 500 rpm. The homogenized mixture is then compressed biaxially in a closed mold, using a compacting pressure of 600 MPa and in the final stage the raw pressed pieces are sintered under vacuum, at a pressure of 10-5 torr, at a sintering temperature of 1050 degrees C maintained for 30 minutes.

21. PATENT OSIM NR. RO129163-B1 / 30.10.2017

TITLE RO/EN: Material compozit de frictiune cu baza fier / IRON-BASED COMPOSITE FRICTION MATERIAL CONTAINS IRON, COPPER, GRAPHITE AND NICKEL

INVENTOR(S): CANDEA VIOREL CONSTANTIN, MERIE VIOLETA VALENTINA, POPA CATALIN OVIDIU, POPA ANGELA ENUTA

ABSTRACT: The invention relates to a composite material made of a Fe-based metal matrix reinforced with ceramic particles, the material being meant to be employed in manufacturing friction pads for cars or in industrial friction applications due to its increased wearing resistance, and average friction coefficient, while the mechanical and tribological properties are maintained constant at high temperatures specific to the operation of friction products. According to the invention, the material has the following composition: 63% Fe, 10% Cu, 7% graphite, 12% Ni, 6% TiO₂ and 2 % alumina, the percentage being expressed by weight.

22. PATENT OSIM NR. RO127453-B1 / 30.08.2017

TITLE RO/EN: Sistem de control al traficului vehiculelor pe o banda, si metoda de exploatare / METHOD AND SYSTEM FOR CONTROLLING TRAFFIC OF ROAD VEHICLES ON ONE LANE BY LIMITING ADMISSIBLE MAXIMAL SPEED ON ONE LANE

INVENTOR(S): LETIA TIBERIU STEFAN, CIUPAN CORNEL

ABSTRACT: The invention relates to a method and a system for controlling the traffic of road vehicles on one lane. The claimed method consists in limiting the admissible maximal speed on one lane, when the speed of the vehicle entering the controlled section is higher than the admissible maximal speed by commanding to a mechanical system the application of an obstacle and the emission of some warning signals, and then the flow of cars on one lane is subjected to a control by limiting the number of vehicles passing through the control section by using the traffic lights in parallel with the obstacle and, in order to control the flows of vehicles on two adjacent lanes to be joined in a single lane, there are used two mechanical systems and two traffic lights, one for each lane, and there is permitted the access of vehicles in an equitable manner given by a ratio of the flows on each lane, said ratio being determined by means of a system which determines the time of passage between two cars for each lane. The claimed system comprises a control equipment (11) and a mechanical system which imposes an obstacle made either by means of an asymmetrical cylinder (6) mounted in a channel (5) which is cut in a control section crosswise on a lane (2), said cylinder (6) being rotated by a motor (8) and producing or cancelling a dislevelment (7), or by means of a hydraulic device (29) actuating an obstacle in the shape of a trap mounted on the lane in the control section.

23. PATENT OSIM NR. RO128055-B1 / 28.07.2017

TITLE RO/EN: Dispozitiv si metoda de testare a dintilor rotilor dintate asimetrice / DEVICE FOR TESTING TEETH OF ASYMMETRIC GEAR WHEELS, COMPRISES BASE PLATE, TEST SPECIMEN SUPPORT, FASTENING YOKE, TEST SPECIMEN, RACK SUPPORT AND RACK

INVENTOR(S): LOBONTIU MIRCEA, RAVAI NAGY SANDOR

ABSTRACT: The invention relates to a device and a method for testing the teeth of asymmetric gear wheels, intended to be employed in determining the maximal load force of a tooth of asymmetric gear wheel under static conditions in the stage of designing the gear wheel in the assembly of a reduction unit. According to the invention, the device is mounted on a materials testing machine (8) and comprises a base plate (1), a test specimen support (5), a fastening yoke (6), a test specimen (4), a rack support (2) and a rack (3). The teeth testing method, as claimed by the invention, has the following stages: manufacturing the test specimen (4), placing the device (7) into the materials testing machine (8), placing the test specimen (4) in the support (5), driving the device (7) for applying a stress on the tooth, measuring the variation of the tangential testing force F_{ta} and of the tooth deformation up to the moment of the breaking thereof, removing the used test specimen (4) from the device (7), removing the device (7) from the materials testing machine (8) and processing the obtained data.

24. PATENT OSIM NR. RO130450-B1 / 30.03.2017

TITLE RO/EN: Reductor magnetic cu raport de transmisie in trepte / MAGNETIC REDUCTION GEAR WITH STEPPED



TRANSMISSION RATIO USED FOR TRANSFERRING TORQUE AND ROTARY SPEED OF A ROTATING ELECTRICAL MACHINE

INVENTOR(S): FODOREAN DANIEL

ABSTRACT: The invention relates to a magnetic reduction gear with stepped transmission ratio used for transferring torque and rotary speed of a rotating three phase electrical machine towards a certain consumer. According to the invention, the reduction gear comprises an inner rotor, consisting of : ferromagnetic core (1) of electrotechnic-grade steel sheets and permanent magnets (2) made of rare earth, an inner air gap (3), a fixed part, consisting of some ferromagnetic teeth (4) of level L1 made of electrotechnic-grade steel, an air gap (5) being provided between the ferromagnetic teeth (4) and an envelope (6) of non-magnetic material whose length exceeds the length of the active part of the reduction gear and is used for guiding some supplemental teeth (4) of level L2, L3 and L4 which will be inserted, upon necessities, into the air gap (5), an outer air gap (7) placed between the fixed part and the outer rotor of the magnetic reduction gear, an outer rotor consisting of : some permanent magnets (8) made of rare earth and ferromagnetic core (9) of electrotechnic-grade steel sheets and an outer mobile device of the reduction gear, consisting in its turn of the supplemental ferromagnetic teeth (4) of level L2, L3 and L4, the length of each level being different, the teeth being attached to some non-magnetic rings (10) which have different diameters, they are placed in different planes and are used for guiding the supplemental teeth (4) of level L2, L3 and L4 in the air gap (5) of the fixed part of the reduction gear.

25. PATENT OSIM NR. RO130062-B1 / 28.02.2017

TITLE RO/EN: Procedeu si material compozit pentru realizarea placilor sintetice ornamentale / PROCESS AND COMPOSITE MATERIAL FOR MANUFACTURING SYNTHETIC ORNAMENTAL PLATES

INVENTOR(S): SABAU EMILIA, BALC NICOLAE OCTAVIAN, BERE PETRU PAUL

ABSTRACT: The invention relates to a process for manufacturing synthetic ornamental plates to be used in constructions. According to the invention, the process consists in applying a usual stripping layer on a mould made of silicon rubber, after which a first mixture consisting of 60% polyester matrix and 40% calcium carbonate is poured so as to cover the height of the mould asperities and it is maintained until reaching the gel point at the room temperature, further on a reinforcing mixture comprising 30% sand, 30% minced wastes of glass fiber and 40% polyester matrix, mixed for 20 min. is poured and afterwards the mould, filled and leveled, is transferred into a polymerization oven where it is kept at the temperature of 60 degrees C for 2h, and, after the mould stripping, a compact composite material results.

26. PATENT OSIM NR. RO130354-B1 / 30.12.2016

TITLE RO/EN: Procedeu de obtinere a unei pulberi nanostructurate de tipul permalloy (supermalloy)/rhometal / NANOSTRUCTURED POWDER OF PERMALLOY (SUPERMALLOY) RHOMETAL TYPE AND PROCESS FOR PREPARING THE SAME

INVENTOR(S): CHICINAS IONEL, MARINCA TRAIAN FLORIN, POPA FLORIN, NEAMTU BOGDAN VIOREL

ABSTRACT: The invention relates to a composite nanocrystalline powder of pseudo "core-shell" type and to a process for preparing the same, the powder being meant to be used for manufacturing magnetic cores, with soft magnetic material properties and high electric resistivity, to operate in alternating current at medium frequencies. The claimed powder consists of composite particles which have a core of Permalloy type alloy - Ni3Fe or Supermalloy - 79Ni16Fe5Mo, as mass percentage, with nanocrystalline structure, and a quasi-continuous outer layer of fine Fe carbonyl particles bonded to the Permalloy particles by means of a specific thermal treatment, after which an interface 64Fe36Ni, as mass percentage, is formed between the core and the outer layer. The claimed process consists in preparing a mechanical mixture formed of nanocrystalline powder of Ni3Fe of large granulation and Fe carbonyl powder of small granulation, ranging between 6...9, with a mass ratio ranging between 92/8...60/40, the necessary amount of mixture being subjected to wet or dry homogenization, compacted at a pressure ranging between 300...600 MPa, followed by a thermal treatment in argon protected atmosphere, for one hour, at a temperature of 400...550 degrees C, and then the powder mixture is slightly ground in a mortar and screened through a sieve having a mesh size of 40.

27. PATENT EPO NR. EP2869433-B1 / 21.09.2016

TITLE RO/EN: Masina sincrona cu flux axial si magneti permanenti cu concentrare de flux magnetic / AXIAL FLUX PERMANENT MAGNET ELECTRICAL MACHINE FOR USE WITH E.G. WIND TURBINE, HAS STATOR OR ROTOR INCLUDING DISCRETE WINDINGS THAT ARE MOUNTED RADIALLY AT EQUAL DISTANCE, WITH HOLLOW SPACES AND ON INNER WINDINGS SUPPORT

INVENTOR(S): BREBAN STEFAN, MESTER VICTOR, OPREA CLAUDIU ALEXANDRU

ABSTRACT: The machine has a rotor arranged coaxial with a stator and mounted to allow rotation relative to the stator. One of the rotor and the stator includes permanent magnets (24) mounted radially with alternating NS-SN-NS circumferential magnetization and intercalated with magnetic poles (22). The stator or rotor includes discrete windings (10) that are mounted radially at equal distance, on a stator or rotor outer windings support, with hollow spaces and on an inner windings support. A mounting system comprises a retaining part and a clamping part.

28. PATENT OSIM NR. RO128768-B1 / 30.06.2016

TITLE RO/EN: Dispozitiv de reducere a vâscozității uleiurilor de ungere, la pornirea, la temperaturi ambientale scăzute, a motoarelor cu ardere internă / DEVICE FOR REDUCING LUBE OIL VISCOSITY UPON START OF INTERNAL COMBUSTION ENGINES AT REDUCED AMBIENT TEMPERATURES

INVENTOR(S): MARIASIU FLORIN EMIL, VARGA BOGDAN OVIDIU, DEAC TEODORA ALEXANDRA

ABSTRACT: The invention relates to a device for reducing the viscosity of lube oils upon the start of internal combustion engines at reduced ambient temperatures. According to the invention, the device uses a low-power ultrasound emitter (2) which reduces the lube oil viscosity upon the start of internal combustion engines at reduced ambient temperatures and a process automation module comprising an electronic control module (3) which receives information concerning the temperature of the lube oil by means of a thermostat (5).

29. PATENT OSIM NR. RO125211-B1 / 30.05.2016

TITLE RO/EN: Metoda de conducere a roboților industriali / METHOD FOR CONTROLLING INDUSTRIAL ROBOTS BASED ON SIMULATION, TRAINING AND EXPLOITATION OF THREE-LAYERED NEURAL NETWORK WITH SIX NEURONS IN INPUT LAYER DETERMINED BY SIMULATION ON MATHEMATIC MODEL OR BY EXPERIMENTATION ON PHYSICAL MODEL

INVENTOR(S): CIUPAN EMILIA, MORAR LIVIU, CIUPAN CORNEL

ABSTRACT: The invention relates to a method for controlling industrial robots. According to the invention, the method is based on the simulation, training and exploitation of a three-layered neural network having six neurons in the input layer, corresponding to the coordinates of six engine torques q_i , where $i=1, \dots, 6$, six neurons in the output layer and a number of neurons ranging between 9 and 50 in the intermediary layer, the data for training the network being determined by the simulation on a mathematic model or by the experimentation on a physical model of a robot, by imposing some successive modifications of the engine torques q_i , by a pace p , and then, by simultaneous modification of 2, 3, 4, 5 and 6 coordinates of the engine torques q_i , resulting by actuating the kinematic axes related to the same, for each set of input data $q_{i,j}$, $i=1, \dots, m$, there resulting a set of output data $X_j, Y_j, Z_j, \psi_{ij}, \theta_{ij}, \phi_{ij}$, which are used for training the network.

30. PATENT OSIM NR. RO125210-B1 / 30.05.2016

TITLE RO/EN: Metoda de instruire a roboților pentru evitarea obstacolelor / METHOD OF INSTRUCTING ROBOTS TO AVOID OBSTACLES IN A WORKING SPACE WHERE THE INSTRUCTION DATA IS DETERMINED BY SIMULATION USING THE MATHEMATICAL MODEL OR EXPERIMENTALLY USING A PHYSICAL MODEL OF THE ROBOT

INVENTOR(S): CIUPAN EMILIA, MORAR LIVIU, CIUPAN CORNEL

ABSTRACT: The invention relates to a method of instructing industrial robots to avoid obstacles in a working space. According to the invention, the method of instructing an industrial robot is based on modeling, instructing and exploiting a three-layered neural network having a number of k neurons in the input layer, corresponding to the number of degrees of freedom, a number of m neurons in the output layer, corresponding to the number of kinematic axes and a number n , ranging from 9 to 50 neurons in the intermediate layer, the instruction data being determined by simulation, using a mathematic model, or experimentally, using a physical model of the robot, by the convenient selection of a points cloud in a working space, an obstacle placed in the robot path being automatically avoided by an adequate network instruction with input data corresponding to some points in the direct robot path and output data corresponding to the by-pass path.

31. PATENT OSIM NR. RO127080-B1 / 30.03.2016

TITLE RO/EN: Instalatie de indepartare a dioxidului de carbon din gazele reziduale / PROCESS FOR RETAINING CARBON DIOXIDE FROM SPENT GASES BY CHEMICAL ABSORPTION

INVENTOR(S): VASILE HOTEA, GABRIEL BADESCU, JUHASZ JOZSEF

ABSTRACT: The invention relates to a process for retaining carbon dioxide from spent gases and to a plant for carrying out the process. According to the invention, the process consists in neutralizing the gases with a 2M solution of sodium and potassium carbonate with bicarbonate formation, followed by the thermal decomposition of the solution, at a temperature of 80...110 degrees C, with release of CO₂ which is partially condensed and dried at a pressure of 2 bar, the carbon dioxide being released by pressure reduction and temperature increase up to 120 degrees C, after which it is compressed and stored. The plant claimed by the invention consists of a tank (2) in which the neutralizing solution is prepared, a pressure pump (3) which sends the 2M solution to a spent gas mixing zone (5) of a centrifugal scrubber (1) representing the absorption column, where the mixture is pulverized through a nozzle (7), the CO₂-containing solution being discharged at the bottom of the scrubber, passed through a filter (9) and an exchanger (10) and entering the top part of a desorption column (11), wherefrom the resulting flow of CO₂-rich vapour is passed through a condenser (12) and a drier (13) to the compression and storing zone.

32. PATENT OSIM NR. RO128077-B1 / 30.03.2016

TITLE RO/EN: Generator de plasma de putere mica la presiune atmosferica / LOW POWER PLASMA GENERATOR AT



ATMOSPHERIC PRESSURE

INVENTOR(S): PETREUS DORIN-MARIUS, PLAIAN EMIL, GRAMA ALIN MARIUS, CORDOS EMIL, CADAR SERGIU IULIAN

ABSTRACT: The invention relates to a radiofrequency plasma generator at atmospheric pressure. According to the invention, the generator comprises an electronic commutator (1) consisting of a MOS-type transistor controlled by means of a grid (2) with a rectangular signal with variable pulse duty factor, between the supply terminal and the drain terminal of the commutator (1) there being placed a choke-coil (3) and in parallel with the commutator there being mounted a shunt capacitor (4) ensuring the load transfer during the commutations, while an RLC-type load network (5) plays the role of ensuring the commutation conditions for the MOS transistor, and a power amplifier consisting of a rectangular signal generator (6) with a role in generating the control signal which is transmitted to a block (7) controlling the grid (2) by means of which there is ensured a current amplification of the signal, said signal being necessary for controlling a power amplifier (8) at optimal parameters, at the output of the power amplifier (8) there being placed a magnetic-type voltage step-up amplifier (9) with a regulation loop (10), the output voltage of the amplifier (9) being applied to an electrode-block (11) on an active electrode (20), and by closing the field lines to a reference electrode there takes place the generation of the plasma at atmospheric pressure.

33. PATENT OSIM NR. RO129217-B1 / 29.01.2016

TITLE RO/EN: Dispozitiv pentru laminarea longitudinala a rotilor dintate cu dantura dreapta, pe prese / DEVICE FOR LONGITUDINAL PRESS-ROLLING OF GEAR WHEELS WITH STRAIGHT TEETH, HAS INDIVIDUAL WHEEL OF DRIVING DEFORMATION ROLLER

INVENTOR(S): MARIAN IONUT, TINTELECAN MARIUS

ABSTRACT: The invention relates to a device for the longitudinal press-rolling of the gear wheels with straight teeth. According to the invention, the device consists of a body (11) whereon there is mounted a number of deformation rollers (9) individually driven by a gear wheel (8) which takes over the rotation movement by downwardly moving a rack (5), integral inside the cover of the upper part (1), the deformation roller (9) being actuated by a kinematic chain which comprises the deformation roller (9), the individual wheel (8) of driving the deformation roller (9) and the rack (5) with downward movement, the body (11) of the device exactly positioning both the deformation rollers (9) and the individual driving gear wheels (8), and the process of obtaining the gear wheels (8) is based on the direct contact of the deformation rollers (9) with a blank (7) which is deformed, these having an intended rotation movement induced by the downward movement of the racks (5) which determines the rotation of the driving gear wheels (8) and the reversed rotation of the deformation rollers (9).

34. PATENT OSIM NR. RO101011-B1 / 30.12.2015

TITLE RO/EN: Procedeu de obtinere a unor concentrate de muscovit din pegmatite feldspatice / MUSCOVITE CONCENTRATE FROM FELDSPAR PEGMATITES PRODUCTION METHOD

INVENTOR(S): IUGA ALEXANDRU-IULIU, MORAR ROMAN, CUGLESAN IOAN, DASCALESCU LUCIAN-DORU, NEAMTU VASILE, POP DUMITRU-MITICA, VRANAI STEFAN, SOOS MANEA CAROL, TIMBUS RADU, RANCA POMPILIU, BOLBA REMUS, MURESAN NICOLAE, KISS IOSIF, TOMESCU VALENTIN

ABSTRACT: A muscovite concentrate is obtd. from a granular material, a by prod. of processing feld-spathoid pegmatite. This material contains over 50% muscovite, spangles, quartz impurity feldspar and wood. A proposed technical soln. for the redn. of adhesive forces involves heating the material at 300-400 deg.C in an oven. Following classification in two stages and redn. of surface humidity at 150 deg.C sepn. is carried out in a three directional intensive electric field.

35. PATENT OSIM NR. RO127385-B1 / 30.10.2015

TITLE RO/EN: Minigriper compliant cu actuator piezoelectric / COMPLIANT MINIGRIPPER WITH PIEZOELECTRIC ACTUATOR MEANT FOR PRECISE MANIPULATION OF VARIOUS SIZE OBJECTS

INVENTOR(S): NOVEANU SIMONA, CSIBI IOSIF VENCEL, MANDRU DAN, NOVEANU DAN CRISTIAN, LUNGU ION

ABSTRACT: The invention relates to a compliant minigripper (1) with piezoelectric actuator (2) meant for the precise manipulation of various size objects, in applications specific to fine mechanics. According to the invention, the minigripper (1) is conceived as a monoblock structure, with some flexible couples (3) obtained by thinning the section of some symmetrically arranged kinematic elements (4) in the structure, the compliant minigripper body (1) containing ten flexible couples (3) which transmit the movement and the force, by the elastic deformation of the material they are made of, by means of the kinematic elements (4), at the outlet of the piezoelectric actuator (2), to some fastening elements (5) which carry out the manipulation, by modifying the geometric shape of the flexible couples (3) (elliptical, rectangular, parabolic, circular or rectangular with various transition radii), selecting the material that the compliant minigripper (1) is made of (steel, brass, polymethylmethacrylate, polytetrafluoroethylene etc.) as well as by the variation of the supply voltage of the piezoelectric actuator (2), there being ensured a wider range of dimensions of the objects to be manipulated as well as the use thereof in various media.

36. PATENT OSIM NR. RO129538-B1 / 30.09.2015

TITLE RO/EN: Dispozitiv de control si reglare a pozitiei sculelor cu suprafete elicoidale / DEVICE FOR SHARPENING TOOLS WITH HELICAL SURFACES, PLACED ON THE TABLE OF A SHARPENER WITH ABRASIVE DISCS

INVENTOR(S): VUSCAN GHEORGHE IOAN, MICACIU ALEXANDRU

ABSTRACT: The invention relates to a device used for sharpening tools with helical surfaces, placed on the table of a sharpener with abrasive discs. According to the invention, the device consists of a main shaft (2) whereon the tool (1) to be sharpened is fixed, the main shaft (2) passes through a ball bearing (4) inside which there is fixed, by hooping, a profiled ring (5) which is in contact with the main shaft (2), the ball bearing (4) being fastened in a box (6) which is integral with a shaft (7) of a worm gear (11), on the shaft (7) there being mounted a spring disk (8) and a pressure bearing (9) fixed in the bore hole of an upper plate (10), the worm gear (11) mounted with a wedge on the shaft (7) gears with a worm (12), at the end of a worm shaft (13) there being placed a handle (15) for gearing the worm (12), by actuating the handle (15), the worm (12) gears with the worm gear (11) which by rotation inclines the box (6) together with the ball bearing (4) under an inclination angle which coincides with the inclination angle of the screw of the tool (1) thus defining the helical walk of the tool (1), the tool (1) being driven by actuating a hand wheel (3) in one sense or another, alternately, the tool (1) performing a rotary-translation movement under an abrasive disk (16) placed at the angle.

37. PATENT OSIM NR. RO128980-B1 / 30.09.2015

TITLE RO/EN: Dispozitiv de acoperire preventiva a interiorului pieselor tubulare de dimensiuni mari / DEVICE FOR PREVENTIVELY LINING THE INTERIOR OF HOLLOW PIECES OF LARGE SIZES

INVENTOR(S): VUSCAN GHEORGHE IOAN, CIGAN VLAD

ABSTRACT: The invention relates to a device used for painting or preventively lining the interior of some hollow pieces of large sizes. According to the invention, the device comprises a support plate (11) whereon there is fastened an electric motor (1) and a reducer (3), the movement being transmitted from the electric motor (1), through the reducer (3), to a case (8) provided with bevel gears, through a bevel gear (2), on the case (8) there being mounted three telescopic legs (9) having, at the ends, a inclinable friction wheel (6), the feeding movement being performed due to a propeller with three arms which come in contact with a hollow semi-finished product (12) by means of the friction wheels (6) which axially displace the entire assembly, the adjustment of the propeller inclination angle being carried out both manually, and by means of a step-by-step electric motor (7), some air, oxygen and acetylene sources being connected to a supplying sleeve (10), in a tank (4) there being stored paint or powders for the preventive lining, which are entrained by an air jet, on the interior surface of the hollow semi-finished product (12) through an atomizer (5) which performs a helical movement together with the case (8).

38. PATENT OSIM NR. RO129228-B1 / 28.08.2015

TITLE RO/EN: Procedeu de obtinere a unui material compozit fonoabsorbant / SOUNDPROOFING COMPOSITE MATERIAL COMPRISES FIR SAWDUST GRAINS AND POLYURETHANE FOAM

INVENTOR(S): TIUC ANCUTA ELENA, RUSU TIBERIU, NEMES OVIDIU

ABSTRACT: The invention relates to a soundproofing composite material and process for preparing the same. The claimed material comprises 70...80% fir sawdust grains having a humidity of 9.3...10.4% and a density of 0.035...0.039 g/cm³ and 20...30% polyurethane foam, the percentage being expressed by weight. The claimed process consists in vigorously mixing the polyol and isocyanate components in a ratio of 100:70 for 5...8 s, at the room temperature, afterwards adding fir or beech sawdust grains, the resulting mixture is poured into a mould and it is maintained for 30...45 min for the reaction completion, wherefrom there results a material having a density of 0.14...0.17 g/cm³, a compressive strength of 0.03...0.07 N/mm², a thermal conductivity of 0.039...0.083 W/m.K and an acoustical absorption coefficient alpha within the range 0.55...0.95 in the frequency range of 1000...6300 Hz.

39. PATENT OSIM NR. RO128093-B1 / 29.05.2015

TITLE RO/EN: Procedeu de obtinere a placilor din materiale compozite polimerice armate cu fibre / PROCESS AND DEVICE FOR MAKING PLATES OF POLYMERIC COMPOSITE MATERIALS REINFORCED WITH FIBERS

INVENTOR(S): BERE PETRU PAUL, BERCE PETRU, NEMES OVIDIU, BALC NICOLAE

ABSTRACT: The invention relates to a process and a device for making plates of polymeric composite materials such as polyester, epoxy, phenolic, vinylester resins or other polymers, reinforced with fabrics made of glass fibers, carbon fibers, aramidic fibers and the like. According to the invention, the process consists in laying the composite material (3) in non-polymerized condition onto the surface of a plane mould (2), coating the same with a plastic foil (4), pressing the composite material (3) onto the mould (2) by means of a pressing device with cylinders (5) which removes the excess of composite material (3) towards the mould edges so that, by reducing the volume of composite material (3) under the plastic foil (4), there is formed a vacuum pressure which presses the composite material (3) during the entire polymerization process, and, in the end, the resulting plate of composite material is removed from the mould and the plastic foil (4) is eliminated. According to the invention, the device comprises a roller working table (1) whereon there moves the plane mould (2) with the composite material (3) covered with the plastic foil (4) and a pressing device with cylinders (5).

**40. PATENT EPO NR. EP2444209-B1 / 22.04.2015**

TITLE RO/EN: Metoda de generare a topologiei robotilor paraleli reconfigurabili cu actuatori verticali / METHOD FOR GENERATION OF KINEMATICAL STRUCTURES FOR RECONFIGURABLE PARALLEL ROBOTS WITH VERTICAL ACTUATORS, INVOLVES DETERMINING NUMBER OF PRISMATIC- SPHERICAL-UNIVERSAL KINEMATIC CHAINS BASED ON DESIRED NUMBER OF DEGREES OF FREEDOM

INVENTOR(S): BRISAN CORNEL, HILLER MANFRED

ABSTRACT: The method involves knowing the number of degrees of freedom of the robot. The number of prismatic-spherical-universal (PSU) kinematic chains is determined based on the desired number of degrees of freedom. The number of the prismatic - spherical - rotational (PSR) kinematic chains is determined. The conditional expression relating the robot and kinematic chains is satisfied. The reconfigurability of the structures is assured by the utilization of the mounting dimensions between the elements that form all the kinematic chains.

41. PATENT OSIM NR. RO127399-B1 / 30.03.2015

TITLE RO/EN: Beton cu agregate din deseuri de sticla / CONCRETE COMPOSITION USED FOR CONSTRUCTION, COMPRISES PORTLAND CEMENT, SUPERFINE SILICA, GLASS POWDER, RIVER AGGREGATES, CRUSHED AND SCREENED GLASS AGGREGATE, WATER, AND SUPERPLASTIFYING ADDITIVE

INVENTOR(S): MAGUREANU CORNELIA, CORBU OFELIA CORNELIA

ABSTRACT: The invention relates to a concrete composition for constructions. According to the invention, the composition consists of 15.91% Portland cement, 1.99% superfine silica, 3.97% fine glass powder, 32.55...36% river aggregates having sizes of up to 4 mm and 37...39.79% crushed and screened glass aggregate having a grain size of 4...16 mm, 5.39% mixing water and 0.40% superplasticizing additive.

42. PATENT OSIM NR. RO127825-B1 / 27.02.2015

TITLE RO/EN: Procedeu de separare a feldspatului de cuarț din minereurile pegmatitice / PROCESS FOR SEPARATING QUARTZ FELDSPAR FROM PEGMATITE ORES, INVOLVES CRUSHING AND WET GRINDING PEGMATITE ORE, REMOVING MICA BY GRAVITY SCREENING, DRAINING ORE IN FILTERING BED, CONDITIONING WITH HYDROFLUORIC ACID, AND SEPARATING

INVENTOR(S): VADAN DUMITRU, MORAR ROMAN, VADAN IOAN, SUARASAN ILIE, GOREA MARIA, VADAN MARIA

ABSTRACT: The invention relates to a process for separating quartz feldspar from pegmatite ores. According to the invention, the process consists in crushing and wet grinding a pegmatite ore until a grain size of 0.25 mm is reached, after which the mica is removed by gravity screening, the ore is drained in filtering bed until a humidity of 10% is reached, then is dried to a humidity of 0.2%, is conditioned with hydrofluoric acid, after which the product is subjected to separation in an induction magnetic field 1.4...1.6 T and finally is separated in electrostatic field to obtain quartz with a SiO₂ content of at least 98% and a Fe₂O₃ content of up to 0.08% and felspar with a Fe₂O₃ content of up to 0.55%.

43. PATENT OSIM NR. RO128500-B1 / 30.01.2015

TITLE RO/EN: Beton autocompactant fara adaosuri minerale / SELF-COMPACTING CONCRETE (C 50/60) WITHOUT MINERAL ADDITIONS, MEANT FOR PRECAST ELEMENT MANUFACTURING

INVENTOR(S): IOANI ADRIAN MIRCEA, SZILAGYI HENRIETTE, MIRCEA CALIN RADU GRIGORE

ABSTRACT: The invention relates to a concrete composition for the precast/precompressed elements manufacturing. According to the invention, the composition consists of 510 kg of cement, 920 kg of river sand with a particle size of up to 4 mm, 230 kg of coarse river aggregate, 492 kg of coarse river aggregate having the particle size of 8...16 mm, 5.61 kg of super-plasticizer of polycarboxylic type and 199 kg of water.

44. PATENT OSIM NR. RO128581-B1 / 30.12.2014

TITLE RO/EN: Motor cu reluctanta comutata cu autoventilatie interna la rotor / MACHINE WITH COMMUTED RELUCTANCE MOTOR, WITH INTERNAL ROTOR SELF-VENTILATION CONSISTS OF A STATOR MADE OF ELECTROTECHNICAL STEEL SHEETS FORMING EIGHT STATOR POLES

INVENTOR(S): RUBA MIRCEA, FODOREAN DANIEL

ABSTRACT: The invention relates to a commuted reluctance motor, with internal rotor self-ventilation. According to the invention, the motor consists of a stator (1) made of electrotechnical steel sheets forming eight stator poles and an electric circuit (2) consisting of four phases, each phase comprising two coils wound around the salient poles located diametrically opposed, and a rotor (3) located inside the stator (1), also made of electrotechnical steel sheets, between every two consecutive salient poles of the rotor (3) there being located some elements (4) made of non-magnetic material, uniting the margins of the poles at the two extreme ends of the rotor (3), said elements (4) being arranged slantwise, being twisted in such a manner as to ensure a perfect alignment with the margins of the rotor poles, at the extremities of rotor (3), said

elements (4) acting as an internal fan which, together with the rotor (3) movement ventilates the stator windings, forcing the warm air around the windings to get out, being replaced with cold air from outside.

45. PATENT OSIM NR. RO127706-B1 / 30.09.2014

TITLE RO/EN: Metoda securizata de comunicatie intre dispozitive fixe si mobile / SECURED SYSTEM AND METHOD OF COMMUNICATION BETWEEN FIXED AND MOBILE DEVICES

INVENTOR(S): ASTILEAN ADINA, FOLEA SILVIU, AVRAM CAMELIA, HULEA MIHAI, MIRON RADU FLORIN, LETIA TIBERIU STEFAN, CIUPAN EMILIA

ABSTRACT: The invention relates to a secured system and method of communication between fixed and mobile devices based on fingerprints. The claimed system comprises one or more emitting subsystems (1) and a receiving subsystem (2) which consists of a distributed application server connected to the Internet, the secured information transmission between these subsystems (1 and 2) being based on the use of wireless or wired communication technology, each emitting subsystem (1) comprising: a fingerprint reader (FPS), provided with a storage and processing unit enabling the communication by Bluetooth, Wi-Fi or GPRS, a device (GPS) which communicates with the fingerprint reader (FPS) and a mobile terminal (MT), embedding GPRS technology or a computer (PC), the connection to the receiving subsystem (2) being carried out by means of the mobile terminal (MT) or the computer (PC). The claimed method provides the emission and the reception of an encrypted message by using an encrypting algorithm with a symmetrical key and limited duration, the symmetrical key being generated by the use of the information resulting by reading the fingerprint of participants in a communication session and the information concerning the position thereof, and the authentication is carried out according to a protocol also implying, besides the user's fingerprint and position, the identity codes of the entities involved in the communication system and the number of the communication session between the involved users.

46. PATENT OSIM NR. RO125433-B1 / 30.07.2014

TITLE RO/EN: Dispozitiv pentru ambutisare cu asistare hidraulica / HYDRAULICALLY ASSISTED METAL SHEET DRAWING DEVICE COMPRISES A BODY SUPPORTING A DIE HAVING AN ACTIVE PLATE AND A CENTERING RING, WHERE THE BODY IS PROVIDED IN THE CENTRAL PART WITH A CAVITY

INVENTOR(S): ACHIMAS GHEORGHE, COMSA DAN-SORIN, LAZARESCU LUCIAN, ACHIMAS SORIN, CECLAN VASILE ADRIAN

ABSTRACT: The invention relates to a metal sheet drawing device, meant to be used for reducing the thickness of walls by a combined mechanic and hydraulic process. According to the invention, the device comprises a body (1) supporting a die (2) having an active plate (3) and a centering ring (4), the body (1) being provided in the central part with a cavity (5) wherein oil is accumulated and the working pressure is reached, and with an orifice (6) wherethrough the oil intake is performed, the deformation of the blank (9) being achieved by using the punch (10) which presses on the blank through the active plate (3), the drawing thereof being thus achieved.

47. PATENT OSIM NR. RO127398-B1 / 30.04.2014

TITLE RO/EN: Procedeu de obtinere a betoanelor de ultra-inalta performanta / VERY HIGH PERFORMANCE CONCRETE COMPRISES CEMENT, VERY FINE SILICA POWDER, FINE QUARTZ SAND, SHORT STRAIGHT METAL FIBRES, METAL FIBRES WITH BENT ENDS, SUPERPLASTICIZING POLYCARBOXYLIC ADDITIVE AND WATER

INVENTOR(S): MAGUREANU CORNELIA, CORBU OFELIA CORNELIA, SOSA IOAN, SZILAGYI HENRIETTE, HEGHES BOGDAN HOREA

ABSTRACT: The invention relates to a concrete composition and to a process for preparing the same. According to the invention, the composition comprises 1 CEM I 62.5 R cement mass unit and the following components expressed as units from the cement amount: 0.25...0.27 units of very fine silica powder; 0.44...0.46 units of fine quartz sand having a grain size of 0...0.7 mm; 0.15...0.17 units of fine quartz sand having a grain size of 0.4...1.4 mm; 0.09...0.095 units of short straight metal fibres, 0.09...0.095 units of metal fibres with bent ends, 0.065 units of superplasticizing polycarboxylic additive of the IV-th generation, 0.15...0.17 units of water. The process claimed by the invention consists in mixing the materials in the dry state in a forced draft mixer for 2 min, after which the water is admixed together with the plasticizer and they are mixed for 8 min and at the end there are admixed the metal fibres while stirring, thereby resulting a concrete composition to be poured into formworks, dismantled and subjected to thermal treatment.

48. PATENT OSIM NR. RO88149-B1 / 28.02.2014

TITLE RO/EN: Mecanism de rotatie oscilant pentru roboti industriali / OSCILLATING ROTATOR FOR INDUSTRIAL ROBOT - CONSISTS OF HELICOIDAL PLUNGER LOCATED IN PERFORATED SLEEVE ASSEMBLY AND COOPERATING WITH STEPPED ELECTRIC MOTOR

INVENTOR(S): POP I. IOAN, ISPAS VIRGIL, ISPAS VIOREL

49. PATENT OSIM NR. RO127480-B1 / 30.01.2014



TITLE RO/EN: Tija centromedulara autoblocanta / SELF-LOCKING INTRAMEDULLARY NAIL FOR OSTEOSYNTHESIS, HAS CENTRAL CORE WITH INTERNAL SHAFT AND MULTIPLE TUBULAR MODULES, INSERTED INTO OUTER ROD, WHERE ONE OF MODULES IS FIXED ON INTERNAL SHAFT

INVENTOR(S): COSTE CAMILIO VICTOR, GROZAV SORIN DUMITRU

ABSTRACT: The invention relates to an intramedullary nail used in the intramedullary osteosynthesis with closed focus. According to the invention, the nail comprises an outer rod (1) wherein there is inserted a central core (7) consisting of an internal shaft (8) and several tubular modules (9 and 10) provided with some indents (13), a module (9) being fixed on the internal shaft (8) and a module (10) being freely placed on the internal shaft (8), between the indents (13) being placed some screws (6) by means of which the fixation relative to the bone is carried out by a rotation motion of the internal shaft (8) of the central core (7). **USE** - Self-locking intramedullary nail for use in osteosynthesis. **DESCRIPTION OF DRAWING(S)** - The drawing shows a sectional view of a self-locking intramedullary nail.

50. PATENT OSIM NR. RO127534-B1 / 30.12.2013

TITLE RO/EN: Procedeu de obtinere a structurilor de sustinere celulara si materiale compozite destinate ingineriei tesuturilor / PROCESS FOR PREPARING CELL SUPPORTING STRUCTURES AND COMPOSITE MATERIALS MEANT FOR TISSUE ENGINEERING

INVENTOR(S): POPA CATALIN, CONT LIANA, DINDELEGAN GEORGE, SIMON VIORICA, BRIE IOANA, PAVEL CODRUTA, CANDEA VIOREL

ABSTRACT: The present invention relates to a process for directly preparing cell supporting structures by electrospinning, carried out with an installation comprising a square-shaped or an octagonal-shaped collector made of austenitic steel, having on the edges a lattice of slits whereon there is alternately placed, on both faces, a unidirectional or bidirectional arrangement of yarns of absorbable nature representing the matrix. The matrix and the yarns are made of different bioabsorbable polymers ensuring an optimal bioerosion duration and an optimal duration for maintaining the mechanical strength of the resulting membranes. From the thus resulting composite membranes there can be manufactured tubes for 3D tissue growth by bonding on template with the dissolved matrix polymer.

51. PATENT OSIM NR. RO125337-B1 / 30.10.2013

TITLE RO/EN: Metoda pentru determinarea modulului de elasticitate longitudinal al materialelor / METHOD FOR DETERMINING VALUE OF LONGITUDINAL ELASTIC MODULUS OF MATERIAL INVOLVES CREATING IMPULSE BY BODY OF MASS, DETERMINING TEST SAMPLE BY SOME HELICAL SPRINGS AND SUPPORTING RETURN PLATE

INVENTOR(S): ARGHIR MARIANA

ABSTRACT: The invention relates to a method for determining the value of the longitudinal elastic modulus of a material. According to the invention, the method consists in taking over 40...60% of the impulse created by a body (4) of a mass (M), launched from a height (h), determined above a test sample (1) by some helical springs (6) supporting a return plate (5) and mounted on a rest plate (8), the test sample (1) taking over 20...30% of the impulse value, while the rest of it is taken over by the helical springs (6) through the further compression thereof.

52. PATENT OSIM NR. RO126255-B1 / 30.09.2013

TITLE RO/EN: Motor electric trifazat cu reluctanta comutata tolerant la defecte / MODULAR FAULT-TOLERANT ELECTRIC MOTOR COMPRISING NINE MODULES ASSEMBLED OF STEEL SHEETS AND REINFORCED BY MEANS OF NON-MAGNETIC RODS, ON THE YOKES OF MODULES THERE ARE WOUND SOME COILS

INVENTOR(S): RUBA MIRCEA, SZABO LORAND

ABSTRACT: The invention relates to a modular fault-tolerant electric motor, operating on the principle of minimal magnetic reluctance, which consists of a stator (1) comprising nine modules (2) assembled of steel sheets and reinforced by means of non-magnetic rods (3), on the yokes of modules (2) there are wound some coils (4), the modules being magnetically insulated by some non-magnetic spacers (5) which also ensure the required angular shift from one another, and by means of other frontal non-magnetic spacers (11), the modules are insulated with respect to some shields (9) which comprise some rolling bearings (10) wherein there rotate a shaft (7) of a rotor (6).

53. PATENT OSIM NR. RO125014-B1 / 28.06.2013

TITLE RO/EN: Compozitie pentru placi, panouri si tavane casetate usoare / COMPOSITION FOR LIGHT POROUS SOUND-ABSORBING AND HEAT INSULATING PANELS, PLATES AND COFFERED CEILINGS

INVENTOR(S): ARGHIR MARIANA, UNGUR PATRICIA, UNGUR PETRU, MIHAILA STEFAN, PAFUCAN TEODOR

ABSTRACT: The invention relates to a composition for sound absorbing and heat insulating building elements used in civil and industrial buildings. According to the invention, the composition comprises moulding alpha plaster, micronized calcite, dehydrated lime, white cement, expanded polystyrene or expanded perlite beads, set retarders, oxide powders

and dyestuffs.

54. PATENT OSIM NR. RO127090-B1 / 30.01.2013

TITLE RO/EN: Robot modular autopropulsat / MODULAR INSPECTING AND EXPLORING ROBOT COMPRISING PLURALITY OF MODULES FOR CHECKING OPERATION STATE OF INTERNAL WALL OF PIPES WITHIN GAS GRIDS, SEWAGE SYSTEMS OR PIPELINES FOR CIRCULATION OF OTHER GASEOUS OR LIQUID MEDIA

INVENTOR(S): TATAR MIHAI OLIMPIU, ALUTEI ADRIAN, CIREBEA CLAUDIU IOAN

ABSTRACT: The invention relates to a robot comprising a plurality of modules for checking the operation state of the internal wall of pipes within gas grids, sewage systems or pipelines for the circulation of other gaseous or liquid media. According to the invention, the robot comprises at least one passive module which consists of a cylinder (11) provided at its ends with two covers (10) in which there are cut some holes through which some supply cables pass, its motion being ensured by two groups of three wheels (8) mounted within some suspensions with adjustable travel on the radial direction, each of them consisting of some rods (6) supporting a wheel (8) movable inside a cylinder (3), a compression spring (5) being mounted between them and a fork of the rod (6), where the rods (6) are provided with through holes with the centres placed on a generatrix, where through a bolt (4) can get in/out, the suspensions being fixed to some support elements (1) detachably assembled with the covers (10).

55. PATENT OSIM NR. RO126271-B1 / 28.12.2012

TITLE RO/EN: Robot chirurgical / SURGICAL ROBOT COMPRISES A POSITIONING MODULE WITH THREE DEGREES OF MOBILITY, A POSITIONING MODULE WITH FIVE DEGREES OF MOBILITY WHICH SUPPORTS A SURGICAL INSTRUMENT WITH THREE DEGREES OF MOBILITY AND ACTIVE MOTION

INVENTOR(S): PLITEA NICOLAE, PISLA DOINA LIANA, VAIDA LIVIU CALIN, GHERMAN BOGDAN GEORGE

ABSTRACT: The present invention relates to a surgical robot comprising a positioning module (1) with three degrees of mobility, a positioning module (31) with five degrees of mobility which supports a surgical instrument (32) with three degrees of mobility and active motion, by means of an active or passive cardan couple (2), there being also provided the embodiment that, for complex interventions, a system of surgical robots may be used, said system comprising a central robot (57) with an orientation module (1) with three degrees of mobility, and two robots (58) and (59), respectively, provided with orientation modules (31) with five degrees of mobility and a surgical instrument (32), in which the central robot (57) conducts a laparoscope or a video camera and robots (58) and (59) carry out functions specific to surgeon hands.

56. PATENT OSIM NR. RO126456-B1 / 29.11.2012

TITLE RO/EN: Metoda de germinare a semintelor cu radiatii infrarosii / SEED GERMINATION METHOD INCLUDES PLACING THE SELECTED SEEDS INTO BOXES AND EXPOSING THEM TO INFRARED RADIATION OF HIGH WAVELENGTH UNTIL THE SEEDS GERMINATE OR UNTIL THE FIRST LEAVES OR FLOWERS EMERGE

INVENTOR(S): COMAN MIRELA

ABSTRACT: The invention relates to a method for seed germination. According to the invention, the method includes placing the selected seeds into boxes and exposing them to infrared radiation of high wavelength until the seeds germinate or until the first leaves or flowers emerge, after which the seedlings may be transferred to the field.

57. PATENT OSIM NR. RO125756-B1 / 29.11.2012

TITLE RO/EN: Instalatie de retinere a dioxidului de carbon si a dioxidului de sulf din gazele reziduale / PROCESS FOR THE INTEGRATED RETENTION OF SULPHUR DIOXIDE AND CARBON DIOXIDE FROM RESIDUAL GASES

INVENTOR(S): HOTEA VASILE

ABSTRACT: The invention relates to a process for retaining sulphur dioxide and carbon dioxide from residual gases. According to the invention, the process consists, in a first stage, in treating the residual gases with a solution of sodium carbonate for SO₂ absorption, followed, in a second stage, by CO₂ adsorption on zeolite volcanic tuff, wherefrom there result residual gases having limit values of sulphur dioxide and carbon dioxide for being discharged into the atmosphere. The claimed installation consists of a reservoir (2) for preparing the sodium carbonate solution, a buffer reservoir (3) wherefrom a barrel exhausting pump (7) transfers the sodium carbonate solution to a centrifugal scrubber (1) with sprinkling nozzles, wherefrom the washing solution flows out into a reservoir (4), and a pump (8) carries out the recycling thereof into the scrubber (1), then the washing solution, containing sodium sulphite and bisulphite, in the stirrer reservoir (4) is heated in order to convert the sulphite into bisulphite and then transferred to a tilting crystallizer in order to separate the crystallized sodium bisulphite, the gases from which SO₂ has been retained come out from the centrifugal scrubber (1) and are led to two CO₂ adsorption columns (6) which are natural zeolite filters, and then are discharged into the atmosphere through some electrovalves (9), in a dispersion flue (10), the installation being also provided with a computerized operation system (11).

58. PATENT OSIM NR. RO123490-B1 / 29.11.2012



TITLE RO/EN: Sistem fara fir, pentru telemasurarea inclinatiei / WIRELESS SYSTEM FOR REMOTE MEASURING OF INCLINATION OF OBJECT IN VERTICAL PLANE OF PLACE

INVENTOR(S): MUNTEANU RADU , MOGA DANIEL, IVAN DUMITRU MIRCEA, DOBRA PETRU, MUNTEANU RADU ADRIAN, MOGA ROZICA GABRIELA, VELEA LUCIAN MARIUS

ABSTRACT: The invention relates to a wireless system for measuring the inclination of an object in respect of the vertical plane of the place, the system being carried out on a hardware platform which achieves the measurement of gravity acceleration on three orthogonal directions, using a 3D acceleration sensor (9), for the conversion of said acceleration values into angles relative to the direction and sense of the gravity acceleration vector g there being used an A/D controller (4), based on a computing algorithm implemented with a microcontroller processing unit (2), the measured values being then communicated via an RF transceiver interface (3), to a mobile acquisition unit (7) which displays/stores the measured values and communicates the same to some computing equipments (8), such as PC or PDA, the system being power supplied from an accumulator ACC (6), by means of a management block MA (5) having the function of charging control and monitoring of the charge state of the accumulator ACC (6), the so obtained data being then transmitted to the microcontroller processing unit (2) for being interpreted and then remotely communicated to the acquisition unit (7).

59. PATENT OSIM NR. RO123479-B1 / 28.09.2012

TITLE RO/EN: Aruncator pneumatic pentru matrite de injectat / PNEUMATIC EJECTOR FOR INJECTION MOLD, COMPRISES CYLINDER, PISTON WITH ROD FIXED BETWEEN COVER AND GUIDING BUSHING, CUSHIONING SPRING AND SOME SEALING RINGS

INVENTOR(S): HARAGAS SIMION, TUDOSE LUCIAN MIRCEA, POP DUMITRU OVIDIU

ABSTRACT: The invention relates to a pneumatic ejector employed in the construction of injection moulds for plastics with a view to automatically removing pieces from the moulds. According to the invention, the pneumatic ejector comprises a cylinder (1), a piston (2) with a rod (3) fixed between a cover (4) and a guiding bushing (5), a cushioning spring (6), some sealing rings (7, 8, 9, 10 and 11), where the pressurized air supply of the two cylinder chambers is made through a channel (a) cut into the cover (4) and through another channel (b) cut into the cylinder (1), the channel (a) being supplied with pressurized air for the ejection stroke through a channel (a1) and the channel (b) being supplied with pressurized air for the return stroke through a channel (b1).

60. PATENT OSIM NR. RO123447-B1 / 30.05.2012

TITLE RO/EN: Senzor potentiometric pe baza de ionofor porfirinic cu selectivitate inalta pentru argint / POTENTIOMETRIC SENSOR BASED ON PORPHYRIN IONOPHORE WITH HIGH SELECTIVITY TO SILVER

INVENTOR(S): FAGADAR-COSMA EUGENIA LENUTA, VLASICI DANA, PICA ELENA MARIA, COSTISOR OTILIA, COSMA VIORICA, OLENIC LILIANA, BIZEREA OTILIA

ABSTRACT: The invention relates to a potentiometric sensor for measuring the concentration of silver in liquid samples of various origins and to a process for carrying out the same. According to the invention, the sensor has a body (1) provided with a lid (2) and at the opposite end of the lid (2) there is a conductive copper support (3) which is attached to the body (1) with epoxy resin and on one face of the support (3) there is attached a central wire (6) of the connection cable, while on the other face of the support (3) there is formed a membrane (4), selective to Ag^+ , made of polyvinyl chloride (PVC), plastified with diethylhexyl sebacate (DOS), wherein there is included a composition which contains an ionophore, namely 5,10,15,20-tetrakis-(3-hydroxyphenyl) porphyrine and a lipophilic additive, tetrakis(4-chlorophenyl) potassium borate, the mass ratio PVC:porphyrine:DOS:additive being 33:2:66:1.

61. PATENT OSIM NR. RO123425-B1 / 30.04.2012

TITLE RO/EN: Procedeu de obtinere a pulberii de compusi intermetalici IrAl si IrAl₃ si tinta de iradiere pentru gamagrafie industriala obtinuta din aceasta / PROCESS FOR PREPARING THE POWDER OF IrAl AND IrAl₃ INTERMETALLIC COMPOUNDS AND IRRADIATION TARGET FOR INDUSTRIAL GAMMAGRAPHY OBTAINED THEREWITH

INVENTOR(S): CARLAN PAULA, CHICINAS IONEL

ABSTRACT: The invention relates to a process for preparing sinterable powders of IrAl and IrAl₃ intermetallic compounds meant to be used for obtaining irradiation targets for sources. The process claimed by the invention is a process of mechanical alloying of Ir and Al granules by crushing the same in a stainless steel ball planetary mill, under a protective argon atmosphere. The ball volume : material volume ratio is 20 : 1 at an enclosure filling degree of 35%, the milling time for forming the IrAl compound is 8 h and the milling time for forming the IrAl₃ compound is 28 h. The resulting irradiation target exhibits uniform dispersion of the activable element and reduced self-shielding factor.

62. PATENT OSIM NR. RO125006-B1 / 30.09.2011

TITLE RO/EN: Compozitie pentru pansamente si corsete ortopedice usoare si poroase / COMPOSITION FOR DRESSINGS AND LIGHT AND POROUS ORTHOPAEDIC CORSETS

INVENTOR(S): ARGHIR MARIANA, UNGUR PATRICIA, UNGUR PETRU, MIHAILA STEFAN, LEZEU IOAN

ABSTRACT: The invention relates to a composition for dressings and orthopaedic corsets used in orthopaedy, for fixing the limbs or other parts of the osseous system of human body in case of fractures and luxation. According to the invention, the composition consists of: pottery plaster, white cement, expanded polystyrene granules or expanded pearlite and tartaric acid, as setting retarder.

63. PATENT OSIM NR. RO123245-B8 / 29.04.2011

TITLE RO/EN: Procedeu de obtinere a tuburilor poroase prin rulare cu strat elastic a tablelor sinterizate / PROCESS FOR MAKING POROUS TUBES BY THE ROLLING WITH ELASTIC LAYER OF SINTERED SHEET METAL

INVENTOR(S): VIDA-SIMITI IOAN, CIUPAN CORNEL

ABSTRACT: The invention relates to a process for making a plain or profiled tube-shaped piece of sintered porous sheet metal, by rolling the sheet metal about a roller, using an element coated with an elastic layer. According to the invention, the process consists in using a rigid roller (1) having the diameter corresponding to a tube, and a satellite roller (2) having a larger diameter than the rigid roller (1), covered with an elastic element (3), which performs a planet motion about the rigid roller (1), the planet motion of the satellite roller (2) being composed of a rotation about an axis of the rigid roller (1) and a rotation about its own axis, the elastic element (3) being made of rubber, polyurethane or another elastic material, a support (4) ensuring the position adjustment between the two rollers (1 and 2) and the pressure adjustment relating to the pressing corresponding to the deformation of the porous material, the porous sheet metal (5) being deformed by its passing between the rigid roller (1) and the elastic element (3) of the satellite roller (2).

64. PATENT OSIM NR. RO123261-B8 / 29.04.2011

TITLE RO/EN: Sistem de monitorizare a incarcarii progresive a membrului inferior in recuperarea posttraumatica / SYSTEM FOR MONITORING THE PROGRESSIVE LOADING OF A LOWER LIMB IN POST-TRAUMATIC REHABILITATION

INVENTOR(S): MUNTEANU RADU, MOGA DANIEL, NEAGA FLORIAN CLAUDIU, PETREUS DORIN, DUMITREAN RADU MIHAI, MUNTEANU MIHAI, VLADAREANU LUIGE

ABSTRACT: The invention relates to a system for monitoring the progressive loading of a lower limb and measuring the pressure force at the sole level within a post-traumatic rehabilitation process, said system comprising a network of elastic chambers (CE1, CE2, CE3) located at the level of the lower limb sole under three anatomic areas of maximal pressure of the patient's sole, said chambers communicating through a tubing (T) coupled to a pressure transducer (SP) which detects the current maximal pressure and transmits it to a control and measuring unit (BM) where it is converted into a digital value by a conversion circuit (A/D) then it is transformed into a force value by means of a calibration algorithm implemented on a processing unit (Microcontroller) of the measuring unit and compared with the threshold values stored in the memory of the measuring unit (BM), a warning device (AAL) generating acoustic and light signals when the maximal value of the force measured in a programmed period of time exceeds the pre-established threshold value, the values of various parameters (Tmas, Fs, FP, D) stored in the non volatile memory of the processing unit (Microcontroller) being read or modified by a wireless communication with the measuring unit (BM) by means of an interface (IR) implemented by a Transceiver unit (RF), the supply of the monitoring system being carried out by components belonging to the supply unit (A), an accumulator (ACC) and a charging device (I).

65. PATENT OSIM NR. RO122986-B1 / 28.05.2010

TITLE RO/EN: Circuit de cuplaj fara contact / CONTACTLESS COUPLING CIRCUIT FOR PROCESSING INFORMATION AND PERFORMING INFORMATION EXCHANGE BETWEEN THEM AND TRANSDUCERS SERVING

INVENTOR(S): MUNTEANU RADU IOAN, MOGA DANIEL, MUNTEANU RADU ADRIAN, MUNTEANU MIHAI STELIAN

ABSTRACT: The invention relates to a contactless coupling circuit, meant to supply the systems for processing information and performing the information exchange between them and the transducers serving them, according to the invention, the coupling circuit consisting of two sub-circuits, an independent information processing sub-circuit (S1), which provides the energy supply of the contactless coupling circuit and a dependent information processing sub-circuit (S2) connected to a transducer serving a certain application. The independent information processing sub-circuit (S1) consists of a central unit (UC1), a controlled oscillator with programmable frequency (OCFP), a current control stage (ECC), a unit (BA) for supplying the independent information processing sub-circuit (S1), being magnetically connected, by means of a first coil (B1) with the dependent information processing sub-circuit (S2), which comprises, for this purpose, a coil (B2), a voltage stabilizing and rectifying block (RST) as well as a central unit (UC2), which performs the information exchange with the mentioned transducer, the useful and control signals being passed through some modulator/demodulator and conversion blocks (M/DC1 and M/D C2) and then circulated, between the two information processing sub-circuits (S1 and S2) by means of two infrared emission/reception blocks (BERI1 and BERI2), one for each of the mentioned information processing sub-circuits (S1 and S2).

66. PATENT OSIM NR. RO122976-B1 / 28.05.2010



TITLE RO/EN: Sistem si procedeu pentru masurarea indirecta a masei obiectelor aflate in miscare / SYSTEM FOR INDIRECTLY MEASURING MASS OF OBJECTS IN MOTION COMPRISES CENTRAL PROCESSING UNIT WITH SET OF INTERFACES FOR CATCHING AND TAKING OVER IMAGES

INVENTOR(S): MUNTEANU RADU IOAN, MOGA DANIEL, MUNTEANU RADU ADRIAN, MUNTEANU MIHAI STELIAN

ABSTRACT: The invention relates to a system for indirectly measuring the mass of the objects in motion, by using software applications for the acquisition and processing of visual information, for control and for user interface, system comprising a central processing unit (UC), provided with a set of interfaces (I1...In) towards the devices (CA1, CA2...CAn) for catching and taking over images and an interface (IM) towards a system for monitoring (M1) the environment where to there are coupled the sensors (S1...Sn) providing information on the environment wherein the objects are displaced, the processing unit (UC) having optionally an interface (IC) towards a control subsystem (C1) coupled to some execution elements (ACT1, ACT2...ACTn), from the analysis of the information received and the extraction of the values of the objects geometrical characteristics and the interpolation based on the built transfer surface, with the masses of the determined bodies, there being obtained the indirectly measured mass value (ml) of the visualized object.

67. PATENT OSIM NR. RO122932-B1 / 30.04.2010

TITLE RO/EN: Stand experimental termic cu comanda controlata a perturbatiilor / EXPERIMENTAL STAND WITH THERMAL ENCLOSURES COMPRISES ADJACENT ENCLOSURES, PRINCIPAL ENCLOSURE, ELEMENTARY ENCLOSURES, ELECTRICAL RESISTOR, SUPPLY UNIT AND TEMPERATURE TRANSDUCER

INVENTOR(S): ISOC DORIN, IGNAT AURELIAN DOREL

ABSTRACT: The invention relates to an experimental stand with thermal enclosures, meant for practical works and laboratory research studies on conducting technical processes of complex dynamic properties. According to the invention, the experimental stand comprises some adjacent enclosures (I1, I2, I3 and I4) of which one is a principal enclosure (I1), and the others are elementary enclosures (I2, I3 and I4) formed by means of some removable walls (5, 6 and 7), each enclosure being separately heated by an electrical resistor (R1, R2, R3 and R4), by means of a supply unit (UCT1, UCT2, UCT3 and UCT4), the temperature of each enclosure being measured by a temperature transducer (TT1, TT2, TT3 and TT4), while the control of the supply units (UCT1, UCT2, UCT3 and UCT4) is achieved by a central control unit (UC) which also controls a resistor (R5) located inside a guide body (G), where a turbine (T) of a fan driven by an electric motor (M) blows air which enters the enclosures by some slot covers (C1, C2, C3 and C4) located at the top part of the enclosures.

68. PATENT OSIM NR. RO122822-B1 / 26.02.2010

TITLE RO/EN: Motocompresor / MOTOR-COMPRESSOR USED IN EG.MINING EQUIPMENTS COMPRISES BASE BODY WHERE MOTOR AND COMPRESSOR ENCLOSURES ARE SEPARATED INTO ENCLOSURES, DRIVING CYLINDER WITH JACKET, VALVES, INJECTOR, INTAKE AND COMPRESSION VALVE AND PISTON

INVENTOR(S): CARNARU STELIAN COSMIN

ABSTRACT: The invention relates to a motor-compressor meant to function as such or in batteries, in various applications, such as mining equipments, rock drills etc. According to the invention, the motor-compressor has a more simple construction by the fact that, inside the base body (1), the motor and compressor enclosures are separated into three enclosures (a, b, c) representing the very same volume, such that the first enclosure (a) which is the driving enclosure, has a driving cylinder provided with a jacket (2), a pair of valves (3 and 4), and an injector (5), the third extreme enclosure (c) is compressing and has a jacket (6) and a pair of valves, an intake valve (7) and a compression valve (8), a piston (9, 10) slide in each of the two extreme enclosures (a, c), the two pistons being coaxially rigidly connected with a common rod (11) provided in the middle enclosure (b).

69. PATENT OSIM NR. RO122790-B1 / 29.01.2010

TITLE RO/EN: Senzor potentiometric nitrit-selectiv / NITRITE-SELECTIVE POTENTIOMETRIC SENSOR FOR MEASURING NITRITE CONCENTRATION IN SAMPLES OF VARIOUS ORIGIN

INVENTOR(S): VLASICI DANA, PICA ELENA MARIA, FAGADAR-COSMA EUGENIA LENUTA, BIZEREA OTILIA, COSTISOR OTILIA, COSMA VIORICA

ABSTRACT: The invention relates to a nitrite-selective potentiometric sensor for measuring nitrite concentration in samples of various origin such as environmental pollution samples, food control samples, scientific research samples. According to the invention, the sensor has a body made of polyvinyl chloride bar, which is provided, at its lower part, with a nitrite-selective membrane, formed directly on a copper tablet, the membrane being based on plasticized polyvinyl chloride with o-nitrophenyl octyl ether (O-NPOE) which has embedded the Co(III)-tetraphenylporphyrin ionophore (CoTPPCL) and triethylmethyl-ammonium chloride (TOMACl) as lipophilic additive.



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