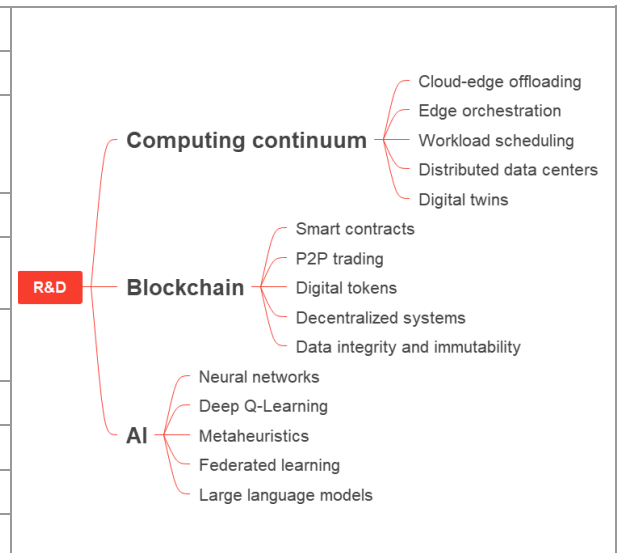


DISTRIBUTED SYSTEMS RESEARCH LABORATORY

Contact details

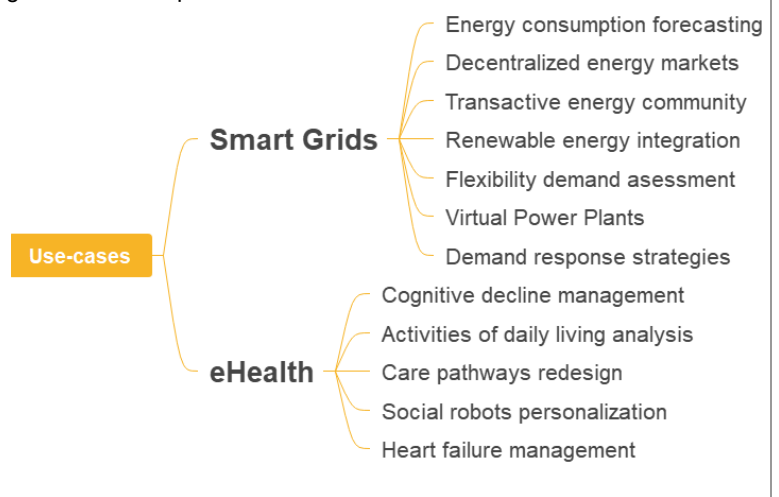
Name	Distributed Systems Research Laboratory
Acronym	DSRL
Logo	
Site	https://dsrl.eu/
Address	G. Baritiu 4-6 HUB UTCN (Sala 1 – Etajul 2), Cluj-Napoca, Romania
Faculty Department	Faculty of Automation and Computer Science Computer Science Department
Telephone	0264-202352, 0264-401443, 0264-401236
Services	https://eeris.eu/ERIF-2000-000B-1205
Director	Prof. Dr. Eng. Tudor Cioara
E-mail	Tudor.Cioara@cs.utcluj.ro



Areas of expertise

The Distributed Systems Research Laboratory has rich history of exploration and innovation, with significant contributions to the academic community, with a track record of publishing over 50 papers in esteemed journals and presenting at prestigious international conferences in recent years. Additionally, the laboratory has taken a leadership role in over 10 European projects, serving as coordinators and/or leading specific work packages or tasks. Expertise in:

- **Artificial Intelligence and Big Data Analysis:** advanced AI techniques, including transformer models, deep neural networks, large language models, and reinforcement learning, to support decision-making and perform predictive analytics.
- **Distributed and scalable data management:** distributed databases, IoT data management, data processing frameworks, scalable storage systems
- **Blockchain and P2P markets:** use of blockchain technology to enable decentralized, privacy-preserving and secure markets including the design and implementation of smart contracts, trustless transaction mechanisms, and tokenized ecosystems.
- **Cloud, Fog, and Edge Computing:** Orchestration and workload offloading between cloud and edge, federated models, distributed deployment, container management.



Team

Prof. Dr. Eng. T. Cioara, Prof. Dr. Eng. I. Salomie, Prof. Dr. Eng. I. Anghel, Assoc. Prof. Dr. Eng. V. Chifu, Assoc. Prof. Dr. Eng. C. Pop, Assoc. Prof. Dr. Eng. A. Hangan, Assist. Prof. Dr. Eng. M. Antal, Assist. Prof. Dr. Eng. C. Antal, PhD Stud. Eng. D. Mitrea, PhD Stud. Eng. L. Todorean, PhD Stud. Eng. A. Rancea, PhD Stud. G. Antonesi

Representative projects

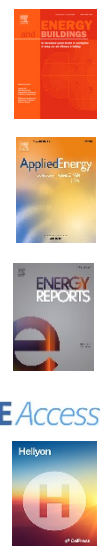
Category	DSRL Role	Project	Focus / timeline
Smart Grid and Energy Efficiency	Partner & Task Leader	 HORIZON-CL5-2023-D3-01-15 https://hedgeiot.eu/	Supporting digital transformation with AI-IoT solutions for edge- cloud platforms in the energy ecosystem / 2023-2026
	Partner & Task Leader	 HORIZON-CL5-2022-D4-01 https://dedalus-horizon.eu/	Developing data-driven, carrier-agnostic demand response tools for energy efficiency and multi-value services / 2023-2026
	Coordinator	76 PHE-2025 PN-IV-P8-8.1-PRE-HE-ORG-2024-0194	Supporting the green and digital transformation of the energy ecosystem and enhancing its resilience through the development and piloting of AI-IoT Edge-cloud and platform solutions / 2025-2026
	Coordinator	40 PHE 2024 PN-IV-P8-8_1-PRE-HE-ORG-2023	Data-driven tools and services for energy-agnostic demand response programs in residential buildings / 2024-2025

	Partner & WP Leader	MiDiNA LEAP-RE	Tools and Techniques for Microgrids Development in North Africa / 2024-2026
	Partner & WP Leader	Bright H2020 LC-SC3-EC-3-2020	Boosting DR through increased Community-level consumer engagement by combining Data-driven and blockchain technology Tools with social science approaches and multi-value service design / 2020-2023
	Partner & WP Leader	DREAM H2020 LCE-01-2017	enabling new Demand Response Advanced, Market oriented and Secure technologies, solutions and business models / 2018 – 2021
Personalized and Intelligent Healthcare	Consortium Coordinator & WP Leader	TransCare THCS2023 https://www.thcs-transcare.eu/	New care pathways for supporting Transitional Care from hospitals to home using AI and personalized digital assistance, Transforming Health and Care Systems / 2024-2027
	Consortium Coordinator & WP Leader	engage AAL-2021 https://engage-aal-project.eu/	Managing Cognitive Decline through theatre therapy, Artificial Intelligence and social robots Driven interventions / 2021-2024
	Consortium Coordinator & WP Leader	2 AAL-2019	Social robot-based solution for elders' Care management and coaching after discharge from Hospital to Home / 2020-2023
	Partner & WP Leader	ReMember-Me AAL-2019	Smart assistant to prevent and detect cognitive decline, promote cognitive function and social inclusion among older adults / 2020-2023
	Partner & WP Leader	Remind AAL-2017	Robotic partner for Multitarget Innovative activation of people with Dementia / 2018-2021
Other notable research projects	Partner & WP Leader		

Significant results

The most representative publications of the past 5 years:

- L. Todorean, T. Cioara, I. Anghel, E. Sarmas, V. Michalakopoulos, V. Marinakis, Demand response optimization for smart grid integrated buildings: Review of technology enablers landscape and innovation challenges, **Elsevier Energy and Buildings**, Volume 326, 2025, 115067, ISSN 0378-7788 **WoS Q1 RED ZONE**
- D. Mitrea, T. Cioara, I. Anghel, L. Todorean, Evolutionary game for incentivizing social cooperation of prosumers in transactive energy communities, **Elsevier Energy and Buildings**, Volume 327, 2025, 115057, **WoS Q1 RED ZONE**
- S. Ferahtia, A. Houari, T. Cioara, M. Bouznit, H. Rezk, A. Djerioui, Recent advances on energy management and control of direct current microgrid for smart cities and industry: A Survey, **Elsevier Applied Energy**, Volume 368, 2024, 123501, ISSN 0306-2619, **WoS Q1 RED ZONE**
- D. Mitrea, V. Chifu, T. Cioara, I. Anghel, C. B. Pop, Social Factors in P2P Energy Trading Using Hedonic Games, in **IEEE Access** 2024 **WoS Q2 YELLOW ZONE**
- C. Pop, T. Cioara, V. Chifu, I. Anghel, F. Bellesini, Electric vehicles coordination for grid balancing using multi-objective Harris Hawks Optimization, **Elsevier Energy Reports**, Volume 12, 2024, **WoS Q2 YELLOW ZONE**
- D. Mitrea, L. Todorean, T. Cioara, I. Anghel, M. Antal, Smart contracts and homomorphic encryption for private P2P energy trading and demand response on blockchain, **Elsevier Heliyon**, 2023, e22357, **WoS Q1 YELLOW ZONE**
- L. Todorean, V. R. Chifu, T. Cioara, I. Anghel, C. B. Pop, Cooperative Games Over Blockchain and Smart Contracts for Self-Sufficient Energy Communities, in **IEEE Access**, vol. 11, 2023 **WoS Q2 YELLOW ZONE**
- C. B. Pop, T. Cioara, I. Anghel, M. Antal, V. R. Chifu, C. Antal, I. Salomie, Review of bio-inspired optimization applications in renewable-powered smart grids: Emerging population-based metaheuristic, **Elsevier Energy Reports**, Volume 8, 2022, Pages 11769-11798, **WoS Q2 YELLOW ZONE**
- C. Antal, T. Cioara, M. Antal, V. Mihailescu, D. Mitrea, I. Anghel, I. Salomie, G. Raveduto, M. Bertoncini, V. Croce, T. Bragatto, F. Carere, F. Bellesini, Blockchain based decentralized local energy flexibility market, **Elsevier Energy Reports**, Volume 7, 2021, Pages 5269-5288, ISSN 2352-4847 **WoS Q2 YELLOW ZONE**
- T. Cioara, M. Antal, V. T. Mihailescu, C. D. Antal, I. M. Anghel, D. Mitrea, Blockchain-Based Decentralized Virtual Power Plants of Small Prosumers, in **IEEE Access**, vol. 9, pp. 29490-29504, 2021 **WoS Q2 YELLOW ZONE**



The offer addressed to the economic environment

Research & development	Core research areas: distributed systems, blockchain, big data and machine learning, intelligent healthcare. Support services in: IoT and healthcare, smart grid management, intelligent systems, data centres operation, linear and nonlinear systems optimization.
Consulting	Consulting activities for companies, institutions, international organizations, and government bodies.
Training	Training courses in the following domains: distributed ledger technologies, programming techniques, cloud and edge computing, big data pipelines.

Last updated: January 2025