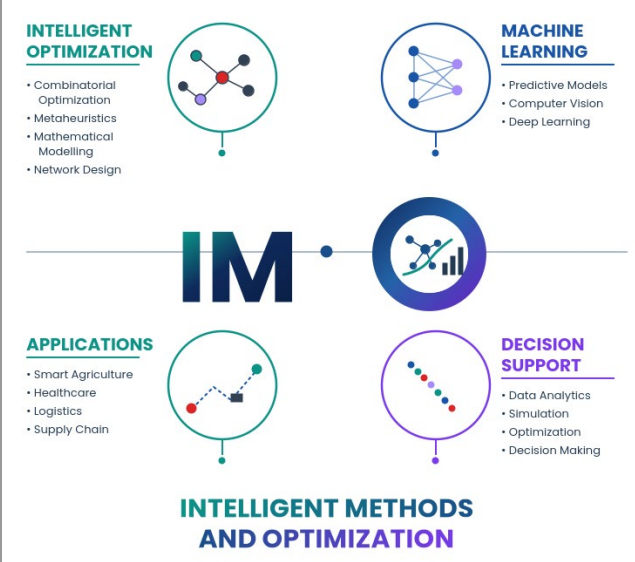


RESEARCH CENTER FOR INTELLIGENT METHODS AND OPTIMIZATION / CENTRUL DE CERCETARE PENTRU METODE INTELENTE ȘI OPTIMIZARE

Contact details

Name	Research Center for Intelligent Methods and Optimization Centrul de cercetare pentru metode inteligente și optimizare	 INTELLIGENT OPTIMIZATION • Combinatorial Optimization • Metaheuristics • Mathematical Modelling • Network Design MACHINE LEARNING • Predictive Models • Computer Vision • Deep Learning APPLICATIONS • Smart Agriculture • Healthcare • Logistics • Supply Chain DECISION SUPPORT • Data Analytics • Simulation • Optimization • Decision Making INTELLIGENT METHODS AND OPTIMIZATION
Acronym	IMO	
Logo	 INTELLIGENT METHODS AND OPTIMIZATION	
Site	http://imo.utcluj.ro	
Address	76 Victoriei Street, Baia Mare, Romania	
Faculty Department	Faculty of Sciences Mathematics and Computer Science Department	
Telephone	+40 262 276059	
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Director	Prof. Dr. Petrica Pop-Sitar	
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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

Intelligent systems: Intelligent agents; Knowledge representation; Explainable AI; Generative AI.

Machine Learning and Deep Learning: Neural networks; Computer vision; Predictive modelling; Data analytics.

Blockchain and Distributed Systems: Distributed ledger technologies; Smart contracts; Decentralized applications; Blockchain security; Trustworthy AI and data sharing.

Applications: Medicine; Smart agriculture; Logistics; Transportation; Supply chain management; Industry 4.0.

Team

Prof. Dr. Petrica Pop Sitar, Assoc. Prof. Dr. Corina Pop Sitar, Assoc. Prof. Dr. Cosmin Sabo, Lecturer. Dr. Mara Hajdu-Macelaru, Assoc. Prof. Dr. Adrian Petrovan, Prof. Dr. Matei Olivi, Assoc. Prof. Dr. Pintea Camelia, Assoc. Prof. Dr. Cosma Ovidiu, PhD Cristian Pop, PhD Daniel Danci, PhD Cristian Pascan, PhD Elias Dejan, PhD Rares Chiuzbaian, PhD Norbert Kovacs, PhD Bogdan Teglas, PhD Gabriel Muresan, PhD Natanael Balog.

Representative projects

“Collaborative Framework for Smart Agriculture – COSA”, Romania’s National Recovery and Resilience Plan PNRR-III-C9-2022-I8, under grant agreement 760070, 2023-2026.

“Building Trust in Ecosystems and Ecosystem Components”, EUROPEAN COMMISSION Horizon 2020 - Research and Innovation Framework Programme, <https://www.bieco.org/> 2020-2023

“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 10 years:

1. E.-N. Dejan, M. Hajdu-Măcelaru, P.C. Pop, Blockchain and IoT for Transparency and Traceability in Supply Chain Management. In Proc. of 18th Int. Conf. on Agents and Artificial Intelligence (ICAART) [CORE: B], Vol. 5, pp. 4364-4371, 2026.
2. C. Pop, A. Petrovan, **P.C. Pop**, Benchmarking the multi-objective evolutionary algorithms for solving non-linear multi-objective fixed-charge transportation problems, In Proceedings of the 19-th Int. Conf. on Parallel Problem Solving from Nature (PPSN) [CORE: A], Lecture Notes in Computer Science, Vol. 16986, pp. 87-102, 2026.
3. C. Pop, P.C. Pop, A. Petrovan, A Prüfer-Based Genetic Algorithm for Solving a Non-Linear Multi-Objective Fixed-Charge Transportation Problem, in Proc. of IEEE International Conference on Systems, Man, and Cybernetics (SMC) [CORE: B], pp. 468-473, 2025.
4. A. Petrovan, P. Pop, C. Sabo, An Improved Diploid Memetic Algorithm for Solving the Multidimensional Multi-Way Number Partitioning Problem, Expert Systems with Applications [JCR, Q1, IF: 7.5], Vol. 284, Article 127962, 2025.
5. C.P. Sitar, M. Hajdu-Macelararu, P.C. Pop, Emerging Technologies Acceptance Within the Romanian Educational System: A Case Study Using the UTAUT Model, in Proc. of 17th International Conference on Computer Supported Education (CSEDU) [CORE: B], Vol. 1, pp. 191-198, 2025.
6. M. Hajdu-Macelararu, R. Chiuzbaian, P.C. Pop, Machine Learning Approaches in the Detection of Amyotrophic Lateral Sclerosis Disease Using Orofacial Gestures, in Proc. of the 17th International Conference on Agents and Artificial Intelligence (ICAART) [CORE: B], Vol. 3, pp. 1132-1139, 2025.
7. P.C. Pop, O. Cosma, C. Sabo, C. Pop Sitar, A Comprehensive Survey on the Generalized Traveling Salesman Problem, European Journal of Operational Research [JCR, Q1, IF: 6.0], Vol. 314(3), pp. 819-835, 2024.
8. A. Petrovan, P.C. Pop, C. Sabo, On the Design of Diploid Memetic Algorithms for Solving the Multidimensional Multi-way Number Partitioning Problem. In: Affenzeller, M., et al. Parallel Problem Solving from Nature — PPSN XVIII. PPSN 2024. Lecture Notes in Computer Science, Vol 15148, pp. 3-19, 2024. [CORE: A]
9. A. Petrovan, P.C. Pop, C. Sabo, I. Zelina, Novel Two-Level Hybrid Genetic Algorithms Based on Different Cayley-Type Encodings for Solving the Clustered Shortest-Path Tree Problem, Expert Systems with Applications [JCR, Q1, IF: 7.5], Vol. 215, Article 119372, 2023.
10. P.C. Pop, The Generalized Minimum Spanning Tree Problem: An Overview of Formulations, Solution Procedures and Latest Advances, European Journal of Operational Research [JCR, Q1, IF: 5.334], Vol. 283(1), pp. 1-15, 2020.
11. O. Cosma, **P.C. Pop** and D. Danculescu, A novel matheuristic approach for a two-stage transportation problem with fixed costs associated to the routes, Computers and Operations Research [JCR, Q2, IF: 4.008], Vol. 118, art.no. 104906, 2020.
12. O. Cosma, D. Danculescu and **P.C. Pop**, On the two-stage transportation problem with fixed charge for opening the distribution centers, IEEE Access [JCR, Q1, IF: 3.745], Vol. 7(1), pp. 113684-113698, 2019.
13. **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 [JCR, Q1, IF: 3.518], Vol. 115, pp. 304- 318, 2018.
14. **P.C. Pop**, O. Matei, C. Sabo and A. Petrovan, A two-level solution approach for solving the generalized minimum spanning tree problem, European Journal of Operational Research [JCR, Q1, IF: 3.806], Vol. 265(2), pp. 478-487, 2018.

The offer addressed to the economic environment

Research & development in core areas	Development of novel methods in Intelligent Systems, Machine Learning and Intelligent Optimization. Design of advanced optimization algorithms, evolutionary and nature-inspired computing techniques, hybrid optimization approaches, predictive models and intelligent decision-support systems for solving complex real-world problems.
Research & development in applied fields	Development of intelligent systems, machine learning and optimization-based solutions for healthcare, smart agriculture, logistics, transportation and supply chain management. Design of advanced methods for solving complex optimization problems, including network design, facility location, transportation and scheduling. Development of predictive models, computer vision systems and decision-support tools for real-world applications.
Consulting	The research team has the necessary expertise to provide consulting services for the development, implementation and deployment of intelligent systems and optimization solutions. These capabilities are supported by the team's research experience, scientific publications, research projects and previously achieved results.