Special Session: Intelligent Algorithms for Decision Making Under Uncertainty in Autonomous and Intelligent Systems

Dear Colleagues,

In the ever-evolving landscape of technology and data, decision-making processes are increasingly confronted with uncertainty. The present Special Session, *"Intelligent Algorithms for Decision Making Under Uncertainty"*, aims to bring together recent advancements in intelligent algorithms designed to support decision-making under uncertain conditions. Leveraging machine learning, artificial intelligence, statistical methods, and computational techniques, these algorithms address challenges across industry, finance, healthcare, engineering, and logistics.

The growing complexity of modern economic and technological systems increases the need for robust and adaptive decision-support tools. In parallel, the rapid development of autonomous and intelligent robotic systems introduces additional uncertainty related to perception, control, and real-time decision-making. This Special Session explicitly welcomes contributions on uncertainty-aware intelligent algorithms for robotics, autonomous systems, and human–robot interaction, as well as their real-world applications.

Topics of Interest

We invite high-quality submissions on the following (but not limited to) topics:

- Intuitionistic fuzzy logic and its applications in decision-making problems
- Development and application of intelligent algorithms for decision-making under uncertainty
- Machine learning and AI methodologies enhancing decision models under uncertainty
- Probabilistic models, inference, and uncertainty quantification
- Stochastic processes and simulations
- Theoretical models and computational techniques for decision support under uncertainty
- Decision-making, control, and intelligent algorithms for autonomous and multi-robot systems under uncertainty, including human–robot interaction
- Real-world applications of intelligent decision models in robotics, industry, education, healthcare, finance, engineering, logistics, and beyond

We look forward to your contributions that will advance this dynamic and impactful field.

Thematic Organizers of the section

Chief organizer of the section

Associate Professor Dr. Velichka Traneva, Faculty of natural sciences, Burgas, Bulgaria

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Associate Professor V. N. Traneva has Ph.D. in Informatics of Bulgarian Academy of Sciences, holds a Master's degree in Finance and Mathematics and professional qualification Manager at Sofia University "Saint Kliment Ohridski", Bulgaria. She is a co-author of numerous publications in area of Mathematics and Informatics taking into account uncertainty in the environment. Her interests are in the field of mathematical modelling, optimization and informatics.

Interests: intuitionistic fuzzy sets; intercriteria analysis; decision making under uncertainty; optimal algorithms; transportation problems.

Organizer of the section

Associate Professor Dr. Stoyan Tranev, Faculty of social sciences, Burgas, Bulgaria

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Chair of section

Associate Professor S. T. Tranev has Ph.D. in Organization and Management of Production of University "Prof. Dr. Assen Zlatarov", Bulgaria, holds a Master's degree in Marketing and Management and professional qualification Mediator in Conflictology to International Academy under Informatization, Institute under conflictology. He is a co-author of numerous publications in Economics. His interests are in the field of management and conflictology.

Interests: conflictology; intuitionistic fuzzy sets; intercriteria analysis; decision making under uncertainty; industrial management; optimal algorithms.

Organizer of the section
Associate Professor Dr. Venelin Todorov, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria
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Associate Professor V. L. Todorov has a Ph. D. in Applied Mathematics of Bulgarian Academy of Sciences, holds a Master's degree in Applied Mathematics at Sofia University "Saint Kliment Ohridski", Bulgaria. He has been awarded with Grand Prize Pythagoras of Ministry of Education and Science for young scientists up to 35 years old for 2021 and the John Atanassov Award of the President of the Republic of Bulgaria for 2021.
Interests: Monte Carlo for solving multidimensional integrals, integral equations and linear systems; algorithms for solving large-scale problems.

Organizer of the section
Associate Professor Dr. Ivan Georgiev, Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria
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Associate Professor I. R. Georgiev has a Ph. D. in Applied Mathematics of University of Ruse, holds a Master's degree in Information and educational technologies at Ruse University, Bulgaria. He is a co-author of numerous publications in area of Mathematical and informatical modelling in logistics and transport; optimization and scheduling theory; predictions in financial mathematics.
Interests: logistics, transportation and manufacturing processes; scheduling theory; modeling and forecasting in financial mathematics; numerical methods for partial and ordinary differential equations.

Organizer of the section
Chief Assistant Professor Dr. Slavi Georgiev , Institute of Mathematics and Informatics, Bulgarian Academy of Sciences, Sofia, Bulgaria
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Chief Assistant Professor S. G. Georgiev has a Ph. D. in Financial Mathematics of University of Ruse, holds a Master's degree in Financial and Engineering Mathematics at University of Ruse, Bulgaria. He is a co-author of numerous publications in area of Mathematical and informatical modelling in computational finance and real processes.
Interests: , pricing and calibrating financial derivatives; numerical methods for partial and ordinary differential equations with applications in computational finance, mathematical modelling of natural and anthropogenic phenomena as: pollutant transfer in air and water environment; honeybee population dynamics; contagious diseases spread.