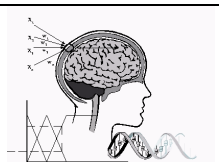
International
Innovation in Knowledge Based and Intelligent Engineering Systems



INVITED SESSION SUMMARY

Title of Session: Intelligent Analytics, Decision Making and Automation

Name, Title and Affiliation of Chair:

Andrii Shekhovtsov[1,2] and Wojciech Sałabun[1,2]

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Details of Session (including aim and scope):

The rapid development of data acquisition technologies, artificial intelligence, and automated systems has fundamentally changed the way complex decisions are supported and executed. Modern engineering, industrial, and socio-economic systems operate in highly dynamic and uncertain environments, where decisions must be made based on heterogeneous data, partially available information, and often conflicting criteria. As a result, there is a growing need for methods that not only analyze data but also transform analytical results into reliable and explainable decisions.

The aim of this invited session is to provide a forum for researchers and practitioners working on theoretical and applied aspects of intelligent analytics, decision support, and automation. The session focuses on approaches that integrate data-driven methods with formal decision-making frameworks and automated or semi-autonomous systems. In particular, we encourage contributions combining artificial intelligence, computational intelligence, optimization, and operations research with decision support methodologies such as multi-criteria decision analysis (MCDA/MCDM).

The scope of the session covers both methodological developments and real-world applications. We are interested in new models, algorithms, and frameworks that improve the quality, robustness, transparency, and automation of decision processes. Particular attention will be paid to methods addressing uncertainty, explainability, human-in-the-loop decision support, hybrid AI–OR approaches, and intelligent systems capable of supporting or autonomously performing decision-related tasks.

Relevant application areas include, but are not limited to, smart manufacturing, logistics and transportation, energy systems, sustainability assessment, finance, healthcare, cyber-physical systems, and smart cities. The session is intended to foster interdisciplinary exchange between communities working in artificial intelligence, data analytics, operations research, and decision sciences, and to promote the development of integrated intelligent decision systems.

Topics of interest include, but are not limited to:
• multi-criteria decision analysis (MCDA/MCDM) and decision support systems (DSS)
• artificial intelligence and computational intelligence in decision processes
• machine learning and intelligent data analytics
• optimization and operations research methods
• integration of AI with decision models (hybrid AI–OR approaches)
• uncertainty modeling and sensitivity/robustness analysis
• explainable artificial intelligence (XAI) and human-in-the-loop decision making
• autonomous and semi-autonomous systems
• process automation and cyber-physical systems (CPS, Industry 4.0/5.0)
• simulation, digital twins, and simulation-based decision support
• intelligent manufacturing, logistics, transportation, and energy systems
• decision-making applications in sustainability and smart cities

Main Contributing Researchers / Research Centres (tentative, if known at this stage): TBA
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