



**INTERNATIONAL**

## INVITED SESSION SUMMARY

**Title of Session:**

Semantic Computing for Intelligent Decision Making (SECIDM)

**Name, Title and Affiliation of Chair:**

Dr. José Miguel Blanco - Information Processing and Telecommunications Center, Universidad Politécnica de Madrid

Prof. Dr. Mouzhi Ge - Faculty of ECRI, Deggendorf Institute of Technology, Germany

**Details of Session (including aim and scope):****Scope**

Decision making in modern intelligent systems is increasing the requirements and the ability to interpret, integrate, and reason over heterogeneous, complex and uncertain data. Emerging semantic technologies, ranging from knowledge representation to ontology-driven inference and hybrid symbolic-subsymbolic approaches, play a crucial role in enabling automated and human-centric decision processes. This invited session focuses on semantic, logic-based, and meaning-aware models that support robust decision making across real-world applications such as cyber-physical systems, smart industry, healthcare, crisis management, autonomous systems, and knowledge-intensive human-AI collaboration.

The scope of the session includes both foundational research and applied frameworks that demonstrate how semantic methods enhance explainability, trustworthiness, interoperability and the quality of decisions.

**Aim**

The aim of the session is to bring together researchers, practitioners, and domain experts exploring semantic-driven paradigms for intelligent decision technologies. The session seeks to showcase advanced methods that leverage semantic information for inference, reasoning, and decision support, while fostering cross-disciplinary approaches that combine semantics with machine learning, cognitive computing, and data analytics. It also intends to stimulate discussion on current challenges, open research questions, evaluation strategies, and emerging requirements from real-world applications. Ultimately, the session aims to highlight the role of semantic methods in improving reliability, transparency, interpretability, and automation in decision-making processes and systems.

**Topics of Interest (include but are not limited to):**

- Semantic LLM for decision making
- Semantic LLM reasoning and explainability
- Semantic AI for decision support and decision automation
- Knowledge representation, ontologies and knowledge graphs
- Hybrid semantic-ML, symbolic-subsymbolic and neuro-symbolic approaches
- Explainable decision making and semantic-based explainability
- Semantic reasoning, inference and uncertainty handling
- Data interoperability, semantic integration, and information fusion
- Cognitive and semantics-based models for decision systems
- Logic-based AI frameworks for decision making
- Semantic methods for planning, scheduling and optimization

- Trustworthy, transparent and human-centric AI systems
- Semantics in autonomous systems, Industry 4.0, IoT and smart environments
- Applications in healthcare, cybersecurity, smart cities, logistics, crisis and emergency management
- Semantic representations for multi-agent systems and distributed intelligence

**Main Contributing Researchers / Research Centres:**

Information Processing and Telecommunications Center (IPTC), Universidad Politécnica de Madrid

European Campus Rottal-Inn, Deggendorf Institute of Technology, Germany

**Website URL of Call for Papers:**

Website will be created shortly

**Email & Contact Details:**

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