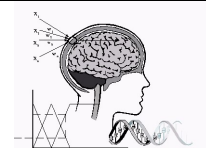




International

*Innovation in Knowledge Based and Intelligent
Engineering Systems*



INVITED SESSION SUMMARY

Title of Session: Advancements in Self-Supervised Learning and AI-Driven Analytics for Enhanced IoT Data Analytics

Name, Title and Affiliation of Chair:

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Details of Session (including aim and scope):

The increasing use of technologies and communication methods has greatly boosted the popularity of the Internet of Things (IoT) in recent years. The IoT paradigm enables connectivity, between devices, sensors, and actuators representing a significant evolution of the internet. This interconnected network gathers real-world data allowing for decision making through data analysis techniques.

In the realm of IoT, where data collection's extensive and diverse data analytics plays a role. It involves examining datasets to uncover hidden patterns identify relationships understand the causes behind events and generate valuable insights. To enhance visibility and strengthen reasoning in this field this special session aims to showcase research in IoT data analytics methodologies. The focus will be on incorporating self-supervised learning trends and the latest advancements in AI-driven analytics to shape solutions for organizing and utilizing collected data in our smart world.

The combination of self-supervised learning and recent advancements in AI like Generative AI and Large Language Models (LLMs) along with leveraging data has the potential to significantly enhance IoT data analytics. This integration tackles the challenges posed by data quality, volume, and real-time analysis. Self-supervised learning enables the analysis of amounts of data, such as sensor readings without the need for manual labelling. LLMs can extract insights and patterns from IoT data that may be too complex for humans to analyse manually. By incorporating these trends into systems, we can achieve efficiency, cost-effectiveness, and enhanced capabilities, for real-time data analysis. Ultimately this will lead to more effective decision-making based on well-informed insights across various industries, from healthcare and manufacturing to transportation and smart cities.

The topics covered in this special session include, but are not limited to:

- Intelligent Descriptive Data Analytics in IoT Environments;
- Intelligent Predictive Data Analytics in IoT Environments;

- Intelligent Prescriptive Data Analytics in IoT Environments;
- Intelligent Diagnostic Data Analytics in IoT Environments;
- Emerging Trends in Self-Supervised Learning for IoT;
- LLMs and Generative AI for Enhanced IoT Analytics;
- Collaborative and Federated Learning in IoT Environments;
- Scalability and Performance Optimization in Large-Scale IoT Analytics;
- Advanced Deep Learning and Data Analytics for the IoT;
- Adaptive Machine Learning Models for Dynamic IoT Environments;
- AI-Based Data Security in IoT environments;
- AI-Based Privacy Preserving of IoT Data;
- Knowledge Graphs-based Analytics of IoT Data;
- Explainable AI for IoT Data;
- Edge-to-Cloud Integration for AI-based Real-Time Analytics.
- Cross-Domain Applications of IoT Data Analytics;
- Industry-Specific Challenges and Solutions in IoT Data Analytics;
- etc.

The Invited Session is initiated by the Research and Initiatives Centre (RIC) at Prince Sultan University, precisely by the Robotics & Internet-of-Things Lab (RIOTU), but we welcome contributions from other institutions and research groups worldwide.

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

- Robotics & Internet-of-Things Lab (RIOTU), Prince Sultan University, Saudi Arabia.
- Computer Science Department, College of Computer and Information Sciences, Prince Sultan University, Saudi Arabia.
- School of Computing, Edinburgh Napier University, UK.
- RIADI Laboratory, University of Manouba, Tunisia.

Website URL of Call for Papers (if any):

Will be created after the acceptance of the invited session

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