Special Session 9: Artificial Intelligence for Urban Digital Twins

Chairs: Bin Zhang, Shenzhen SmartCity Technology Development Group Co., Ltd, China

Brief Description of the Session

Urban Digital Twins (UDTs) serve as a core engine for smart city development, where Artificial Intelligence (AI) is pivotal in enabling dynamic perception, precise simulation, and intelligent decision-making. Today, "AI-powered digital twins" have emerged as a transformative paradigm for urban governance and planning, widely adopted by governments and industries globally. Developing AI technologies tailored for urban digital twins holds both theoretical significance and practical value. Distinct from general AI, these technologies require deep integration of multi-source urban data, physical principles, and socio-economic logic to construct intelligent systems with virtual-real interaction.

Despite advancements in AI and digital twin technologies, city-scale applications face critical challenges: How to efficiently integrate cross-domain heterogeneous data for twin infrastructure? How to leverage AI for real-time simulation and optimization of complex urban systems? How to balance model accuracy with computational efficiency? Addressing these demands robust, scalable, and high-performance AI-driven UDT solutions. This track aims to bridge academia and industry, sharing cutting-edge progress, core challenges, and innovative applications in the field.

Topics

- AI-Driven Dynamic Modeling for City-Scale Digital Twin Platforms
- Intelligent Fusion and Semantic Understanding of Multi-Modal Data (IoT/Remote Sensing/Social Networks)
- AI-Based Urban Traffic Flow Simulation and Congestion Prediction/Optimization
- UDT-Supported Low-Carbon Energy Management and Smart Grid Scheduling
- AI Simulation and Emergency Drills for Urban Disasters (Floods/Fires/Earthquakes)
- Energy Consumption Optimization and Green Computing for Building Clusters in Twin Environments
- Intelligent Public Safety Monitoring and Anomaly Detection with Virtual-Real Interaction
- AI-Assisted Urban Renewal Planning and Spatial Benefit Evaluation
- Metaverse Interaction Technologies and Immersive Decision Support in Digital Twins
- AI-Driven Simulation Systems for Urban Environmental-Social-Governance (ESG)
- Other AI Theories, Algorithms, and Implementations for Urban Digital Twins

Brief Introduction of Chair and Co-chairs with Photo

Bin Zhang, Senior Engineer, Expert of Shenzhen Association for Science and Technology, is Deputy Director of Technology Department, Shenzhen SmartCity Technology Development Group Co.,Ltd. His research focuses on BIM and GIS technologies for Urban digital twin and engineering design. He has received top awards including the Huaxia Construction Science and Technology Award First Prize and Geographic Information Association Science and Technology Special Prize. He leads a key China "14th Five-Year Plan" R&D project and contributes to major Shenzhen science projects. He possesses extensive engineering practical experience in computer and artificial intelligence technology, and has been responsible for the construction of Zhengzhou Metro emergency system, intelligent mining solutions, Shenzhen spatiotemporal platform, digital twin engine, etc.