IEEE VTC 2025 Spring Workshop on Advanced Digital Twin and Pervasive Intelligence Integration for Next-Gen Vehicular Networks

Call for Papers

The integration of advanced digital twin (DT) technology and pervasive intelligence has the potential to transform next-generation vehicular networks by enabling adaptive, self-managing systems. DTs, as real-time digital representations of physical assets, work in tandem with AI and machine learning to optimize operations, providing real-time monitoring, predictive maintenance, and context-aware services. This synergy supports advancements in autonomous vehicles, intelligent traffic management, and urban mobility but also introduces challenges such as handling dense connected devices and diverse mobility scenarios. Critical issues include ensuring data privacy, secure transmission, and interoperability among DTs, AI algorithms, and heterogeneous network components. Addressing these challenges will require innovative strategies to deliver scalable, secure, and reliable solutions for building resilient and efficient transportation ecosystems.

This workshop aims to explore the integration of Digital Twins (DTs) and pervasive intelligence to drive advancements in next-generation vehicular networks, focusing on enhancing energy efficiency, ultra-reliable communications, and ultra-low latency. By addressing key challenges and presenting innovative solutions, it offers a platform for experts to collaborate on accelerating digital transformation in the Internet of Vehicles (IoV) and intelligent transportation systems. Topics of interest include, but are not limited to:

- Scalable Architectures (V2G) Supporting Green Transition in Vehicular Networks
- Advanced AI/ML Solutions for Automated Vehicular Network Management
- Digital Twin-Driven Intelligence for Real-Time Vehicular Network Optimization
- Pervasive Intelligence in Self-Organizing and Adaptive Vehicular Systems
- Sustainable Vehicular Network Designs Leveraging Digital Twin Frameworks
- Enhanced Security and Privacy Mechanisms for DT-Based Vehicular Architectures
- Interoperability Standards for Harmonizing DT and AI Technologies in Transportation
- Real-Time Analytics and Edge Computing in Vehicular Digital Twin Integration
- Novel Applications and Personalized Services Powered by DT in Connected Vehicles
- Predictive Maintenance and Fault Detection Using DTs in Automotive Systems
- IoT-Driven Applications of Digital Twins in Intelligent Transportation Systems
- Big Data Management and Analytics for Digital Twin Integration in Vehicular Contexts
- Virtualized Network Slicing for Customized Digital Twin Services for Vehicles
- Intelligent Drone/UAV-Enabled Traffic Monitoring Powered by DT and AI
- Cross-Domain Innovations Enabled by DT in Smart Mobility and Beyond
- Human-Centric Interfaces and Immersive Experiences in DT-Enhanced Vehicular Systems

Paper submission: Papers must be formatted in the standard IEEE two-column format that is used by the VTC 2025 main conference, and must not exceed six pages in length (including references). All submitted papers will go through a peer review process. All accepted papers will be published in the IEEE Xplore digital library

Committee

General Co-chairs

Octavia A. Dobre (Memorial University, Canada)
Ning Zhang (University of Windsor, Canada)
Tom H. Luan (Xi'an Jiaotong University, China)
Josef Noll (University of Oslo, Norway)

Technical Program Co-chairs

Qihao Li, (Jilin University, China)
Michael Cheffena Gebresilassie (NTNU, Norway)
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Wen Wu (Peng Cheng Laboratory, China)
Hongliang Zhang (Peking University, China)
Mushu Li (Lehigh University, USA)

Publicity Co-chairs

Nan Chen (Tennessee Tech University, USA)
Omar Alhussein (Khalifa University, UAE)

Important Dates:
Submission Deadline: 27 February 2025
Acceptance Notification: 20 April 2025
Final Paper Submission: 4 May
Workshop:17 June 2025