IEEE GLOBECOM 2025 Workshop on The Interplay of Digital Twins and Artificial Intelligence for Next-Generation IoT

Call for Papers

Next-generation Internet of Things (IoT) systems are expected to integrate advanced artificial intelligence (AI) techniques, including pervasive AI, generative AI (GAI), and large language models (LLMs), in combination with digital twin (DT) technology. DTs provide accurate and dynamic virtual representations of physical IoT environments and devices, playing a vital role in data abstraction, synthetic data generation, and real-time system synchronization. Within the IoT context, the DT paradigm can streamline data processing, mitigate information redundancy, and enhance situational awareness. AI algorithms can utilize these digital environments to perform real-time analytics, intelligent control, and autonomous decision-making. The synergy between DT and AI enables the creation of adaptive, context-aware, and resilient IoT services. By generating high-fidelity synthetic data, DTs support the training and deployment of AI models, allowing them to predict system behavior, optimize resource utilization, and ensure reliable connectivity across diverse and dynamic conditions. This collaborative approach not only boosts system efficiency but also enhances quality-of-service (QoS) for end-users. However, building and maintaining effective DTs for highly dynamic IoT ecosystems presents several challenges, such as achieving data completeness, reducing synchronization overhead between DTs and physical devices, and embedding advanced AI frameworks into operational decision processes. Overcoming these challenges calls for innovative strategies, robust modeling and learning techniques, and practical implementations that fully leverage the capabilities of both DT and AI.

This workshop invites high-quality submissions from both academia and industry that offer novel research insights, research methodologies, modeling/learning frameworks, and simulation/implementation results focused on the integration of DTs and AI to support next-generation IoT services. Topics of interest include, but are not limited to:

- DT-Enabled Intelligent IoT Network Deployment
- AI-Driven DTs for Network Management in IoT
- DT-Assisted AI Model Training/Inference for IoT
- Adaptive Resource Management and Network Slicing Using DT and AI
- Traffic Prediction via DT-Enhanced AI
- Efficient Synchronization between DTs and IoT
- AI-Assisted Digital Inclusion for IoT
- Integrating GAI and LLMs with DT for IoT Services
- Cooperative AI for Distributed Inference in DT-Enabled IoT Systems
- Emerging Technologies for DT-AI Interplay in Next-Generation IoT
- DT and AI Applications in IoT Systems
- Security and Privacy in IoT through DT-AI Integration
- Simulation and Implementation of DT-AI Frameworks

Paper submission: Papers must be formatted in the standard IEEE two-column format that is used by the IEEE GLOBECOM 2025 main conference and must not exceed six (6) printed pages in length (10-point font) including references. All submitted papers will go through a peer review process.

Workshop Organizers

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Important Dates

Day of workshop: 12 December 2025
Submission Deadline: 15 July 2025
Acceptance Notification: 1 September 2025
Final Paper Submission: 15 September 2025
Camera ready:10 October 2025