

CALL FOR PAPERS

IEEE Internet of Things Journal

Special Issue on Industrial Internet of Things Communication Networks (IIoT-CNets): Architectures, Protocols, and Intelligence for Next-Generation Industrial Systems

The Industrial Internet of Things (IIoT) is transforming manufacturing, logistics, energy, transportation, and other critical sectors into tightly connected cyber-physical systems. These environments require communication networks that combine deterministic latency, high reliability, massive scalability, seamless wired-wireless integration, security, resilience, and efficient edge intelligence. At the same time, Industry 5.0, 5G-Advanced/6G, TSN/DetNet, AI-driven operations, digital twins, and cloud-edge convergence are creating new architectural and protocol challenges. This Special Issue seeks original research articles, survey and tutorial papers, and industry experience reports that advance the design, deployment, operation, and evolution of next-generation IIoT communication networks.

- Deterministic and Time-Sensitive Networking (TSN, DetNet), including scheduling, synchronization, and cross-domain determinism.
- Private 5G, 5G-Advanced, and 6G for IIoT, including URLLC, mMTC, Open RAN, AI-RAN, and industrial services.
- Network slicing, SDN, NFV, MEC, and cloud/edge-native orchestration for mission-critical industrial traffic.
- AI/ML and LLM-enabled IIoT networking, including traffic prediction, anomaly detection, intent-based control, and self-healing operations.
- Digital twins, XR/Metaverse, collaborative robots, and real-time human-machine communication for Industry 5.0.
- Wired-wireless convergence across deterministic Ethernet, Wi-Fi 7/8, LPWA, satellite backhaul, and programmable optical transport.
- Security, privacy, and trustworthiness, including zero-trust architectures, post-quantum security, OT/IT convergence, and resilient networking.
- Sustainable and carbon-aware IIoT networks, Integrated Sensing and Communication (ISAC), RIS, and intelligent spectrum/resource management.
- Standardization, interoperability, testbeds, field trials, and deployments spanning 3GPP, IETF DetNet/OCN, IEEE 802.1 TSN, 5G-ACIA, O-RAN, and ITU-T.

Important Dates

- Submission Deadline: March 31st, 2027
- First Reviews Due: May 31st, 2027
- Revision Due: July 15th, 2027
- Second Reviews Due/Notification: August 31st, 2027
- Final Manuscript Due: September 30th, 2027
- Publication Date: November 2027

Submission

The original manuscripts to be submitted need to follow the guidelines at: <https://ieee-iotj.org/wp-content/uploads/2025/02/IEEE-IoTJ-Author-Guidelines.pdf>, which should not be concurrently submitted for publication in other venues. Authors should submit their manuscripts through the IEEE Author Portal at: <https://ieee.atyponrex.com/journal/iot>. The authors must select as "Special Issue on Industrial Internet of Things Communication Networks (IIoT-CNets): Architectures, Protocols, and Intelligence for Next-Generation Industrial Systems" when they reach the "Article Type" step in the submission process.

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