

CALL FOR PAPERS

IEEE Internet of Things Journal

Special Issue on From Sensing to Collaborative Action: The Evolution of the Intelligent Internet of Things

The Internet of Things (IoT) is evolving from networks of connected sensors into intelligent systems that perceive, reason, and collaboratively act in the physical world. Advances in multimodal learning, foundation models, edge computing, and wireless networking are enabling robots, autonomous vehicles, drones, and smart devices to translate distributed observations into coordinated physical actions. This transition requires continuous feedback between sensing, decision-making, and execution under constraints on communication bandwidth, latency, computation, energy, and safety. Key challenges include grounding reasoning in physical observations, coordinating heterogeneous devices, adapting to changing environments, and maintaining reliable operation under uncertain connectivity. Addressing these challenges calls for joint advances in sensing, communication, computing, learning, and control, with evaluation extending beyond prediction accuracy and network efficiency to physical task completion, adaptability, and safe interaction.

This Special Issue aims to bring together original research that advances the transition from connected sensing to collaborative physical action in IoT. Particular emphasis is placed on systems that integrate perception, reasoning, and action through environmental feedback. Contributions should explicitly connect their methodological advances to physical interaction and demonstrate their implications for task performance, adaptation, or safety under practical IoT constraints. Theoretical studies, algorithms, system designs, experimental platforms, and field deployments from academia and industry are welcome. Topics of interest include, but are not limited to.

Topics of interest include, but not limited to:

- IoT architectures for integrated perception, reasoning, and physical action
- Multimodal sensor fusion for task-driven perception and interaction
- Physically grounded foundation models for connected intelligent devices
- World models and digital twins for predictive planning and action
- Edge–cloud collaboration for real-time inference and task execution
- Distributed coordination and task allocation among heterogeneous devices
- Semantic and goal-oriented communication for collaborative physical tasks
- Joint sensing, communication, computing, and control optimization
- Continual and adaptive learning through physical interaction
- Security, privacy, robustness, and safety in collaborative IoT
- Testbeds, benchmarks, and applications for IoT perception–action loops

Important Dates

- Submission Deadline: April 30th, 2027
- First Review Due: August 15th, 2027
- Revision Due: October 15th, 2027
- Final Manuscript Due: October 31st, 2027
- Publication Date: December 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 "SI: From Sensing to Collaborative Action: The Evolution of the Intelligent Internet of Things" when they reach the "Article Type" step in the submission process.

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