CALL FOR PAPERS

IEEE Internet of Things Journal

Special Issue on Integrated Sensing, Memory, Communication and Computation for Large-Scale AI Based IoT Systems

The Internet of Things (IoT) is undergoing a paradigm shift fueled by the emergence of large-scale AI models, such as foundation and generative models. These models offer powerful capabilities in perception and decision-making, while introducing significant demands for low-latency, distributed, and resource-efficient processing across heterogeneous IoT systems.

Against this backdrop, Integrated Sensing, Memory, Communication, and Computation (SMCC) is emerging as an AI-native paradigm that unifies sensing front-ends, edge intelligence, and adaptive communication. It underpins real-time, context-aware, and energy-efficient operation across smart environments such as autonomous driving, healthcare, and industrial systems.

This Special Issue seeks original research on SMCC systems optimized for large-scale AI, covering theoretical foundations, system architectures, cross-layer optimization, and large-scale real-world applications to drive scalable and robust intelligent IoT deployments.

Topics of interest include, but not limited to:

- SMCC architectures tailored for large-scale AI inference and training.
- Model-split and collaborative inference frameworks across edge-cloud hierarchies.
- Integrated SMCC pipelines for foundation model deployment.
- AI-native edge and fog computing for latency-critical applications.
- Energy-efficient designs for on-device execution of large models and sensor fusion.
- Cross-layer optimization for AI-driven perception, memory, communication, and decision-making.
- Semantic and task-oriented communication protocols for distributed AI.
- Neuromorphic and event-based sensing systems supporting sparse AI workloads.
- Resource-aware orchestration of sensing, memory, communication, and computation components in heterogeneous SMCC environments.
- Trustworthy and robust SMCC co-designs under dynamic and uncertain AI workloads.
- Hardware/software co-design for embedded execution of transformer and generative models.
- Applications driven by large-scale AI: smart cities, autonomous systems, intelligent healthcare, etc.

Important Dates

- Submission Deadline: ~~May 15th, 2026~~ June 5th, 2026
- First Review Due: July 15th, 2026
- Revision Due: July 30th, 2026
- Second Reviews Due/Notification: Augus
- Final Manuscript Due: November 30th, 2
- Publication Date: January 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 Integrated Sensing, Memory, Communication and Computation for Large-Scale AI Based IoT Systems" when they reach the "Article Type" step in the submission process.

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