IEEE Journal of Selected Areas in Sensors

CALL FOR PAPERS

IEEE Journal of Selected Areas in Sensors Special Section on

Trustworthy and Safe Generative Artificial Intelligence and Large Language Models (LLMs) for Sensor IoT

Justification and Scope:

The integration of Generative Artificial Intelligence (GenAI) and Large Language Models (LLMs) into sensor networks heralds a new era for the Internet of Things (IoT), promising intelligent, adaptive ecosystems. With their advanced natural language processing, contextual reasoning, and data synthesis capabilities, GenAI and LLMs empower sensor networks to break free from traditional constraints, enabling applications like predictive maintenance in industrial settings, real-time patient monitoring in healthcare, and context-aware environmental sensing. These systems can offer enhanced user interaction, dynamic anomaly detection, and personalized services by acting as interpreters of human queries and generators of actionable insights from diverse sensor data.

However, as sensor networks are often resource-constrained, deploying GenAI and LLMs brings significant challenges, especially in terms of trustworthiness and safety. To fully unlock the potential of these technologies in sensor IoT, future research must focus on developing lightweight model architectures, hybrid edge-cloud frameworks for latency-sensitive applications, and robust privacy-preserving techniques. Addressing these issues is crucial for propelling sensor IoT towards autonomous, human-centric intelligence, transforming raw data into proactive decision-making while ensuring security, sustainability, and scalability in an increasingly connected world. This Special Section welcomes original research articles, tutorials, and review papers that explore innovative approaches to integrating trustworthy and safe GenAI and LLMs within sensor IoT.

Topics of Interest (include, but are not limited to):

- Trustworthy GenAI & LLM-Driven Sensing, Communication, and Computation for Sensor Networks
- Secure Resource Optimization in Large-Scale Sensor Networks via GenAI & LLM
- Privacy-Preserving GenAI/LLM Heterogeneous Sensor Data Fusion
- Safe Anomaly Detection & Predictive Maintenance for Industrial Sensors with GenAI/LLM
- Trustworthy Environmental Perception through Multi-Sensor Fusion and GenAI/LLM
- Lightweight, Secure GenAI/LLM Design & Deployment on Edge Sensor Nodes
- Trusted Swarm Intelligence in Distributed Sensor Networks via GenAI/LLM
- Privacy-Preserving GenAI/LLM Synthesis & Sharing of Sensitive Sensor Data
- Secure GenAI/LLM Digital Twin Platforms for Sensor Network Simulation & Optimization
- Security & Robustness of GenAI/LLM against Adversarial Attacks in Sensor Environments
- Green Computing Power for Training Secure Generative Models in Sensor Applications
- Secure Protocols Linking Generative Models to Legacy Sensor Hardware
- Blockchain-based Trusted Sharing & Traceability of Synthetic Sensor Data from GenAI/LLM
- GenAI/LLM-enabled Secure Wireless Computing Power Network within Sensor Systems
- Real-World Validation of Trustworthy GenAI/LLM-enhanced Sensor Networks in Grids, Agriculture, Wearables

Important Dates:

- Manuscript Submission: September 1, 2025
- Completion of First-Round Review: October 15, 2025
- Deadline for Revision Submission: November 15, 2025
- Notification of Acceptance: December 15, 2025
- Publication: February 2026

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