

CALL FOR PAPERS

IEEE Journal of Selected Areas in Sensors Special Section on

Agentic AI-Powered Sensors for Self-Adaptive Cyber-Physical Environments

Justification of Theme

The proposed theme, Agentic AI-Powered Sensors for Self-Adaptive Cyber-Physical Environments, addresses the urgent need for intelligent, autonomous, and context-aware sensing systems in the era of ubiquitous connectivity and automation. Traditional AI-based sensors are limited to reactive data interpretation, lacking the cognitive and decision-making capabilities required for dynamic and uncertain environments. Agentic AI introduces a transformative shift enabling sensors to operate as autonomous agents capable of goal-driven reasoning, self-learning, and adaptive coordination across interconnected cyber-physical systems. This paradigm supports emerging applications such as 6G-enabled smart cities, autonomous transportation, digital twins, industrial IoT, precision healthcare, and green energy systems, where real-time adaptation, reliability, and sustainability are critical. By integrating multi-agent reinforcement learning, edge intelligence, and neuromorphic computing, agentic sensors can autonomously manage complexity, reduce latency, and ensure trust and security in mission-critical environments.

This Special Issue aims to advance the theoretical foundations, architectures, and practical implementations of such self-adaptive sensing ecosystems, bridging AI, hardware-software co-design, and system autonomy. The theme aligns with IEEE's mission of promoting cutting-edge innovation and responds directly to the technological evolution toward self-sustaining, intelligent sensing frameworks for next-generation cyber-physical environments.

It is intended that this Special Section of the IEEE Journal of Selected Areas in Sensors (JSAS) will show the state-of-the-art in Agentic AI-Powered Sensors for Self-Adaptive Cyber-Physical Environments. This Special Section will highlight the most recent advances, challenges, and innovations in the development of intelligent, autonomous, and goal-driven sensing systems capable of proactive decision-making, adaptive learning, and autonomous coordination across interconnected cyber-physical networks. Original research contributions, tutorials, and review papers are sought in Agentic AI-Powered Sensors for Self-Adaptive Cyber-Physical Environments related areas including (but not limited to):

Topics of Interest

- Agentic AI architectures and frameworks for intelligent sensing
- Self-adaptive and goal-oriented sensing systems in dynamic environments
- Multi-agent reinforcement learning for distributed sensor intelligence
- Cognitive, semantic, and context-aware sensing mechanisms
- Edge and fog intelligence for decentralized sensor decision-making
- Digital twin-enabled adaptive sensing and system self-optimization
- Neuromorphic, quantum, and bio-inspired intelligent sensors
- Trustworthy, secure, and privacy-preserving autonomous sensor systems
- Energy-efficient and sustainable sensor intelligence design
- Human-in-the-loop and explainable AI for adaptive sensor networks
- Federated and collaborative learning for large-scale sensing ecosystems
- Integration of agentic sensors in 6G, healthcare, smart cities, and industrial IoT
- Real-world case studies, benchmarks, and experimental validations of agentic sensing systems

Solicited and invited papers shall undergo the standard IEEE Journal of Selected Areas in Sensors (JSAS) peer review process. All manuscripts must be submitted on-line, via the IEEE Author Portal, see <https://iee.atyponrex.com/journal/jsas>. When submitting, please indicate in the “Manuscript Type” roll down menu that the paper is intended for the “**Agentic AI-Powered Sensors for Self-Adaptive Cyber-Physical Environments**” Special Section. Authors are particularly encouraged to **suggest names of potential reviewers** for their manuscripts in the space provided for these recommendations in *Manuscript Central*. For manuscript preparation and submission, please follow the guidelines in the *Information for Authors* at IEEE Journal of Selected Areas in Sensors web page, <https://iee-jsas.org/>

Deadlines:

- Manuscript Submission: August 31, 2026
- Notification of Acceptance: November 30, 2026
- Final Manuscript published in IEEE Xplore: January 31, 2027

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