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IEEE Internet of Things Journal

Special Issue on Fluid Antenna Systems for Autonomous IoT: Agentic AI, Edge Intelligence, and Foundation Models

Fluid antenna systems (FAS) are revolutionizing IoT network architectures by providing unprecedented dynamic spatial configuration capabilities that enable truly autonomous wireless ecosystems. FAS technology allows antennas to intelligently adjust their positioning, activation patterns, and radiation characteristics in real-time, creating adaptive connectivity solutions that transcend the limitations of conventional fixed-position antenna systems. Spanning smart cities, Industry 4.0, precision agriculture, and intelligent healthcare, next-generation IoT demands the seamless integration of FAS capabilities with advanced AI technologies to achieve self-optimizing, self-healing, and continuously evolving network operations.

The integration of AI technologies with FAS unlocks transformative capabilities for autonomous IoT. Agentic AI systems serve as intelligent controllers that perceive channel conditions and execute sophisticated FAS optimization strategies. Edge AI enables distributed intelligence where IoT devices perform local inference for real-time FAS adaptation. Large language models (LLMs) provide intuitive natural language interfaces for FAS configuration and enable semantic communication paradigms. This AI-empowered FAS framework represents a fundamental advancement in how reconfigurable antenna systems are designed, controlled, and optimized for IoT applications.

This special issue explores cutting-edge developments in FAS technology enhanced by agentic AI, edge AI, and LLMs for autonomous IoT ecosystems. We bring together researchers from wireless communications, AI, and IoT communities to address the unique challenges and revolutionary opportunities in AI-empowered FAS systems. We seek original contributions that advance FAS design and optimization, AI-driven antenna control architectures, edge intelligence for distributed FAS management, and practical implementations across diverse IoT verticals.

Topics of interest include (but are not limited to):

- FAS system design and optimization for intelligent IoT ecosystems

- Agentic AI systems for autonomous FAS control and optimization
- Edge AI for distributed and real-time FAS adaptation
- LLM-powered natural language interfaces for FAS configuration
- Fluid antenna multiple access (FAMA) with AI-enhanced scheduling
- Deep learning and reinforcement learning for FAS optimization
- Multi-agent coordination for distributed FAS-IoT networks
- Generative AI for FAS channel modeling and beamforming design
- FAS-enabled integrated sensing and communication (ISAC) systems
- Semantic communication enabled by LLMs and FAS integration
- Self-evolving FAS networks with continuous learning capabilities
- Explainable AI for interpretable FAS decision-making
- Energy-efficient AI-FAS co-design for sustainable IoT
- FAS for massive machine-type communications and ultra-reliable IoT
- Smart city applications with AI-empowered FAS infrastructure
- Industrial IoT and smart manufacturing with FAS connectivity
- Healthcare IoT with FAS-enabled reliable communications
- Autonomous vehicle networks with FAS coordination
- FAS for precision agriculture and environmental monitoring
- Experimental platforms and testbeds for AI-FAS integration
- Standardization and commercialization of FAS for IoT systems
- Security and privacy mechanisms for AI-empowered FAS networks…

Important Dates

- Submission Deadline: December 31, 2026
- First Review Due: February 15, 2027
- Revision Due: March 15, 2027
- Second Reviews Due/Notification: April 30, 2027
- Final Manuscript Due: June 30, 2027
- Publication Date: August 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 Fluid Antenna Systems for Autonomous IoT: Agentic AI, Edge Intelligence, and Foundation Models" when they reach the "Article Type" step in the submission process.

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