IEEE INTERNET OF THINGS JOURNAL SPECIAL ISSUE ON

Ultra-Reliable and Low-Latency Satellite Communications for Ubiquitous Internet of Everything (IoE)

Driven by the proliferating Internet of Everything (IoE) applications, satellite communication emerges as a key enabling technology to establish an omnidirectional network architecture for global IoE service provision. IoE yields a significant paradigm shift from enhanced mobile broadband services to ultra-reliable low-latency communications. In this context, a tradeoff between low latency and ultra-high reliability necessitates in-depth investigations since the latency is typically negative with reliability. However, satellite communications suffer from prohibitive service latency due to long transmission distance, serious blockage effect, and severe propagation attenuation. Even worse, the intrinsic high-dynamic network typologies and the serious Doppler effects in satellite networks pose significant reliability challenges for service delivery. To support ubiquitous IoE services, innovative research efforts are required for efficient satellite communications, thereby jointly enhancing the response latency and service reliability.

The research of ultra-reliable and low-latency satellite communications for ubiquitous IoE is still in its infancy and calls for more extensive and in-depth research efforts. Towards that end, this special issue aims to provide a venue to exchange recent advances in this topic. In this special issue, we look for original and high-quality research works in the novel area of ultra-reliable and low-latency satellite communications for ubiquitous IoE. Theoretical, experimental studies, and also case studies are highly encouraged. Relevant topics include, but are not limited to:

- Architectural enhancement for service provisioning in satellite networks
- Satellite network resource management and optimization
- Advanced antenna-enabled satellite communications
- Optical and terahertz communications for satellite networks
- Prototypes and testbeds for satellite networks
- Physical-layer security and covert communication in satellite networks
- Grant-free/grant-based multi-access technology for satellite communications
- AI-empowered satellite network orchestration
- Age of information in satellite communications
- Multi-access edge computing-enabled satellite communications
- Satellite-enabled integrated sensing and communication
- Synchronous and asynchronous transmission in satellite networks
- Heterogeneous multi-tier satellite networks
- New modulation and multiple access schemes for integrated ground-space networks
- Mobility and handover management for satellite communications
- Robust and low-complexity physical-layer authentication for satellite networks

Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, http://mc.manuscriptcentral.com/iot. When the authors reach the Article Type step in the submission process, they should select SI: Ultra-reliable and low-latency satellite communications for ubiquitous Internet of Everything (IoE). Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at http://ieee-iotj.org/guidelines-for-authors/.

Important Dates:

- Submission Deadline: April 30, 2025
- First Reviews Due: July 30, 2025
- Revision Due: October 1, 2025
- Second Reviews Due/Notification: November 1, 2025
- Final Manuscript Due: November 15, 2025
- Publication Date: January 2026

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