IEEE Journal of Selected Areas in Sensors

CALL FOR PAPERS

IEEE Journal of Selected Areas in Sensors Special Section on

AI-Enabled Integrated Sensing and Communications for Low-Altitude Wireless Sensor Networks

Justification and Scope:

The integration of multi-modal sensing, communications, and computation is becoming essential for robust low-altitude wireless sensor networks (LAWSNs) that support critical applications like UAV coordination, urban air mobility, and aerial monitoring. These systems must simultaneously deliver high-precision environmental perception, ultra-reliable low-latency communications, and distributed processing under strict energy, latency, and reliability constraints. Multi-modal sensing, fusing data from LiDAR, radar, visual, acoustic, and other sensors, enables comprehensive situational awareness necessary for navigation, aircraft recognition, obstacle avoidance, and mission execution. However, the volume and heterogeneity of sensor data require tight coupling with communications and edge computing to allow real-time analysis and responsive operation. Integrated Sensing and Communication (ISAC) merged with artificial intelligence, represents a core paradigm shift toward intelligent connectivity. Fundamental challenges arise from the need to jointly optimise sensing accuracy, communication efficiency, and computational load in resource-constrained, high-mobility environments. Conventional decoupled architectures are inadequate to meet stringent latency, energy, recognition, and coordination demands. Fluctuating channels, Doppler effects, and environmental uncertainties further complicate design. Emerging techniques such as ISAC, federated learning across aerial and ground nodes, and task-oriented communication offer promising pathways. Multi-Model ISAC serves as a cornerstone technology, requiring co-designed algorithms, protocols, and hybrid architectures tailored to low-altitude networks. Converging advances in ultra-reliable low latency communication, edge intelligence, digital twins, and cybersecurity can unlock the potential of intelligent, safe autonomous systems. Significant research efforts are needed in theory, joint optimisation, architecture, safety management, and system deployment to realise efficient and practical ISAC for fully intelligent low-altitude network systems.

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

- AI-driven dynamic resource management in ISAC LAWSNs;
- AI-driven privacy, trust and security issues in ISAC LAWSNs;
- AI-driven multimodal data collection, secure transmission, and processing for LAWSNs;
- AI-driven cloud-edge/fog-end collaborative computing in ISAC LAWSNs;
- AI-driven aerial platform trajectory planning and resource scheduling in ISAC LAWSNs;
- AI-driven channel modelling analysis in ISAC LAWSNs;
- AI-driven energy-harvesting, energy-efficiency or service throughput optimisation issues in ISAC LAWSNs;
- AI-driven low-altitude aircraft recognition and coordination management optimisation in ISAC LAWSNs;
- AI-driven for ISAC LAWSNs softwarization, virtualization, and slicing;
- AI-driven communication protocols and secure network architecture design for ISAC LAWSNs;
- AI-driven digital twin models for simulation and real-time management of ISAC LAWSNs.

Important Dates:

- **Call for paper Announcement:** **March 1, 2026**
- **Manuscript Submission Deadline:** **August 1, 2026**
- **Notification of Acceptance:** **October 1, 2026**
- **Final Manuscript published in IEEE Xplore:** **December 31 2026**
- **Tentative date of paper section:** **March 2027**

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