

## Call for Papers

### Special Issue on Machine Learning for Radio Frequency Sensing

The ability to sense and understand the world around us has undergone a remarkable evolution, reaching new heights of sophistication. This transformative shift is driven by the convergence of advanced sensor technologies with the ever-expanding realm of Radio Frequency (RF) systems. The proliferation of RF systems, encompassing technologies such as Wi-Fi (WiGig, IEEE 802.11 bf), Bluetooth/BLE, LoRa, UWB, 4G/5G, and many others, has fuelled a surge of innovations in sensing-enabled technologies. Within this landscape, there is a growing interest in empowering these RF systems with sensing capabilities. What distinguishes these systems is their inherent ability to transmit and receive signals that unveil useful information about our surroundings, laying the foundation for a diverse range of sensing applications. Simultaneously, the remarkable advancements in machine learning (ML) have opened doors to new data-driven sensing opportunities. This Special Issue aims to explore the opportunities presented by ML/AI in the field of RF sensing systems, with a focus on enhancing performance and enabling ground-breaking sensing applications. This Special Issue aims to build upon synergies between RF systems and sensing – driven by ML, highlighting their pivotal role in shaping the future of this technology across diverse application domains. This Special Issue aims to showcase the latest advancements, breakthroughs, and innovations in the field. The Special Issue targets academic researchers, engineers, and practitioners who are working on cross-system technologies around RF systems, ML, and sensing, with a focus on bridging the gap between theory, simulation and practical realization of applications.

#### Topics

This Special Issue of the IEEE Sensors Journal will showcase state-of-the-art in Machine Learning algorithms and architectures for RF-based Sensing. Original research contributions and review papers are sought related areas including (but not limited to):

- RF systems for environmental and human sensing applications
- Low-power ML architectures for RF sensing
- ML-driven RF sensing applications
- ML for sensing in joint communication and sensing systems
- ML-driven Antenna Array Processing to support RF sensing
- ML-driven RF sensing circuits and device designs
- ML-driven distributed Intelligent surfaces and materials for RF sensing
- Cross-RF system sensing and ML integration
- Performance evaluation and benchmarking of ML-driven RF sensing systems
- Standardization of wireless systems for ML-driven sensing

#### Important dates (tentative) – extended dates

<b>August 30, 2024:</b>	Deadline for Manuscript Submission
<b>December 30, 2024:</b>	Completion of Final Review
<b>February 2025:</b>	Publication

Upon acceptance papers appear as Early Access (preprints) in IEEEExplore and are fully citable.

#### Guest Editors

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#### Submission and Peer Review of Papers

Manuscripts submitted to the special issue should maintain an explicit focus on sensors, sensor architectures, sensor data processing or sensor systems, to be considered within the scope of the IEEE Sensors Journal. All solicited and invited papers shall undergo the standard IEEE Sensors Journal peer review process. All manuscripts must be submitted on-line, via the *IEEE Manuscript Central*, see <http://mc.manuscriptcentral.com/sensors>. Choose the special issue listed in the dropdown menu during submission. For manuscript preparation and submission, please follow the guidelines in the *Information for Authors* at the IEEE Sensors Journal web page, <https://ieee-sensors.org/ieee-sensors-journal/for-authors>