

Call for Papers
IEEE Transactions on AES (TAES) Special Section

Special Section on “Sensor Fusion in Autonomous Systems”

Autonomous vehicles used in modern civilian and military applications gather and process multi-modal data gathered from a variety of sensors – cameras, radars, lidars, and ultrasonic transducers – for a variety of applications such as intelligent transportation systems, urban planning, agriculture, remote sensing, and security and surveillance. The focus of this special issue is on original research in theoretical analysis, signal processing, machine learning, phenomenologies, prototype development, and data generation on multimodal sensor data collection and processing. Special emphasis will be given to techniques that are robust to sensor calibration errors especially when applied to distributed sensing platforms comprising of Unmanned Aerial Vehicle (UAV) drones and Unmanned Surface Vehicle (USV) platforms. We solicit academic, research, and industrial contributions. We encourage contributions on new algorithms, theoretical studies, standards, and novel evaluation metrics for analyzing performance, surveys, software, and hardware experimental prototypes, public datasets, and benchmarks. Although there has been extensive work in specific modalities such as radar, electro-optics, and infra-red (EO/IR) and acoustics, across TAES and other communities, there is a need for an increased cross-fertilization of methodologies and techniques arising from these sub-disciplines to enable the development and deployment of autonomous multimodal sensor systems, operating in dynamic and complex environments, of interest to industry, defense, and government. This Special Section aims to bring together researchers from various relevant sub-disciplines, in academia, government and industry, to introduce the latest advances in sensor fusion for applications in commercial and defense sectors.

Topics of interest include but are not limited to:

- Sensors (cameras, radar, lidar, ultrasonic) and sensor fusion
- Synchronization, calibration, and spectral management
- Co-located and distributed sensor processing
- Phenomenologies of different sensor modalities
- Architecture, models, hardware, and software experimental prototypes
- Unmanned terrestrial, underwater and aerial vehicles
- Safe, ethical, and explainable algorithms
- Performance evaluation of autonomous vehicles: standards, protocols, and metrics
- Hardware-efficient machine learning methods
- Public datasets for benchmarking

The Guest Editors also welcome creative papers outside the areas listed above but related to the overall scope of the special issue. Prospective authors can contact the Guest Editors to ascertain interest on topics that are not listed and should visit <https://mc.manuscriptcentral.com/taes> to submit a manuscript. Manuscripts will be peer-reviewed according to the standard IEEE process and paper templates are available here.

Important Dates:

Manuscript Due: 01/31/2025

Second Review Due: 08/31/2025

First Review Due: 04/30/2025

Final Manuscript Due: 10/31/2025

Revised Manuscript 06/30/2025

Publication Date: 11/30/2025

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