

Advanced Sensing and Sensor Fusion for Intelligent Transportation Systems

The seamless integration of sensor technologies with the transportation infrastructure has leveraged the sensing and communication capabilities to achieve a sustainable intelligent transportation system through which safety, traffic control and infotainment applications would benefit from multiple sensors deployed in different elements of the transportation system. Being one of the most active research fields in both academic and industry, sensor technologies enable various types of vehicular applications, such as autonomous driving, precise fleet management and real-time video analytics, which contribute significantly to bring us traffic efficiency, driving safety and ride comfort. The potential offered to the transportation systems by combining low cost and reliable passive road sensors as well as traffic sensors such as piezoelectric or magnetic MEMS sensors with vehicular networks, IoT and fog computing is enormous.

However, these powerful applications require intensive computation and very large size caching services under ultra-low latency constraints, and thus pose significant challenges on resource constrained vehicles. To address these challenges, various solutions including artificial intelligence based techniques and deep learning models have extensively been applied to data-driven intelligent transportation system model. Despite the pioneering works on the integration of low cost and reliable passive road sensors as well as traffic sensors such as piezoelectric or magnetic MEMS sensors with deep learning models, such techniques still require more accurate perception since the false positives generated during the execution of the algorithms can perturb the utility of real-time data analytics particularly for safety applications in intelligent transportation systems. This special issue focus on discussions and insights into latest advancements and technologies pertaining to data fusion and deep learning techniques in sensing systems for intelligent transportation systems, deployed applications, challenges, and realizable solutions to resolve them. Topics of interest for this special issue include, but are not limited to

- Data fusion techniques for multisensory transportation environments
- Deep learning for intra-vehicle sensor fusion decision
- Advanced sensing for resilient intelligent transportation systems
- Emerging sensor technologies for autonomous vehicles
- Smart sensor-assisted connected vehicles
- Networked sensing for intra-vehicle applications
- Sensor technologies for vehicle accident detection and notification
- Passive sensors for road condition monitoring
- Detection, classification, and recognition of vehicles in motion
- Hardware- and software-focused vulnerabilities with sensors in intelligent transportation systems
- Future perspectives of advanced sensing and learning techniques in intelligent transportation systems

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>. When submitting, please indicate in the “Manuscript Type” roll down menu, and also by e-mail to Ms. Lauren Young, l.young@ieee.org, that the paper is intended for the “Advanced Sensing and Sensor Fusion for Intelligent Transportation Systems” Special Issue. Authors are particularly encouraged to suggest names of potential reviewers for their manuscripts in the space provided for these recommendations in Manuscript Central. For manuscript preparation and submission, please follow the guidelines in the Information for Authors at the IEEE Sensors Journal web page, <http://www.ieee-sensors.org/journals>.

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