IEEE Sensors Council

Guest Editorial
Special Issue on Advanced Sensors and Sensing Technologies for Indoor Positioning and Navigation

INDOOR localization is a growing research field and interest is expanding in many application fields, including services, measurement, mapping, security, and standardization. The quest for appropriate tracking technologies for COVID-19 pandemic control has shown us the importance of identifying the sensors data and processing that are suitable, accurate, reliable, and respectful of privacy. A prominent area is, therefore, that of sensors, where both improved hardware solutions and more powerful data analysis are required.

This diversity of processing approaches and sensors is well represented in this Special Issue that focuses on algorithmic localization innovations with more than a dozen different sensors being used. The use of WiFi measurements, in the form of received signal strength or time of flight, concentrates the majority of innovations. Next, comes cameras and inertial sensors, from wearable devices or drones, to improve pedestrian mobility, multimodal transport, and mapping. The exploitation of other data sensed by the propagation of sounds, radio signals (UWB and RFID), radar signals, and magnetic fields feed the rest of the published articles.

The main challenges addressed by the research are to robustly improve the accuracy of localization and navigation in indoor environments where the signal propagation conditions are strongly altered by the infrastructure and the people or mobile objects occupying the space. The hybridization of complementary data by artificial intelligence methods occupies a growing place in these innovations.

This Special Issue of the IEEE SENSORS JOURNAL focuses on the innovations and improvements in the field of advanced sensors and sensing technologies for indoor positioning and navigation including theory, design, modeling, configuration, characterization, sensor data processing, data analysis, and applications. The Guest Editors of this Special Issue accepted 63 articles for a total of 161 received original submissions and 52 revisions.

Finally, the Guest Editors of this Special Issue would like to express their gratitude to all the authors for their efforts in writing such high-quality articles and to all the reviewers for their precious time. They also wish to thank the Editor-in-Chief, Sandro Carrara, Associate Editor-in-Chief, Gerald Gerlach, and Leigh Ann Testa, for their support in the publication of this Special Issue.

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