

Special Issue on Mobile Geospatial Computing Systems for Ubiquitous Positioning

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Geospatial computing involves using computing devices and sensors to acquire, process, analyze, manage, and visualize geospatial data. However, the tasks of geospatial computing systems are computationally demanding in terms of computation power, data storage capacity, and memory space. With the recent developments in mobile computing and sensor technologies, mobile devices are able to meet the demanding requirements for geospatial computing. As a consequence, mobile geospatial computing systems (MGCSs) emerge and are developed rapidly. Currently, MSCSs have shown their significant importance in facilitating our daily life in many areas (e.g., personal navigation based on virtual reality, mobile games based on mixed reality, self-driving car, unmanned taxi-service, and many location-based services). It should be noted that, among all the functionality within the MSCSs, the ubiquitous positioning is one of the key supporting technologies. The accuracy of the computed positioning largely affects the quality of service in other applications related to MSCSs (e.g., the mobile mapping and mobile geographical information systems (GIS)).

In the past decades, a variety of wireless positioning technologies have been developed, which include GNSS (Global Navigation Satellite Systems), methods to exploit signal-of-opportunities, such as WiFi, RFID, cellular LTE/4G, UWB, WLAN, Bluetooth, digital TV, acoustic/millimeter-wave/light signals, and the hybrid solutions encompassing inertial measurement unit, sonar, laser, infrared (IR), and magnetic field and camera. However, there are still many challenges in emerging applications, which need to be solved (e.g., navigation in indoor environments, the security of the navigation systems to defend against threats, and the data fusion of all source positioning and navigation). To resolve such challenges, the sensor-rich and computation enabling MSCSs may offer new potential.

The special issue aims at publishing the most recent advances in the usage of the MSCSs to improve the quality of the ubiquitous positioning, as well as the development of innovative methods to provide more accurate and reliable positioning for MSCSs. Prospective authors are cordially invited to submit their original manuscript.

Potential topics include but are not limited to the following:

- ▶ Reviews on mobile geospatial computing systems for ubiquitous positioning, the state of the art, and the future
- ▶ Enhancement of ubiquitous positioning for mobile geospatial computing systems
- ▶ Fundamentals of mobile positioning systems
- ▶ GNSS, wireless, and hybrid positioning in mobile devices (smartphones, drones, robots, and UAVs)
- ▶ Simultaneous localization and mapping (SLAM)
- ▶ Seamless positioning and mapping in GNSS-denied environment
- ▶ Context awareness and reasoning for indoor positioning
- ▶ Indoor location-aware networks (Bluetooth, Zigbee, WiFi, UWB, magnetic, and RFID localization)
- ▶ Indoor geographical information systems (GIS), mobile GIS
- ▶ Positioning and mapping using opportunistic signals (LTE/4G/5G, 802.11x, and digital TV)
- ▶ Visual positioning with RGB-D camera
- ▶ Precise positioning using acoustic signals
- ▶ Inertial sensor based positioning
- ▶ Heterogeneous sensor fusion and hybridization for positioning
- ▶ Security, authentication, and privacy aspects of positioning, spoofing, and countermeasures
- ▶ Distributed and collaborative localization, tracking, and mapping
- ▶ Multipath modelling and mitigation, integrity analysis in the localization process
- ▶ Location information for resource planning of radio and networks
- ▶ New location based services (LBSs) and business models

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Papers are published upon acceptance, regardless of the Special Issue publication date.

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