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IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing

Special Issue on "High-fidelity Urban 3D Modeling and Scene Simulation"

The advancement of Internet of Things (IoT) sensing technology, robotics technology, computer vision technology, and aerospace photogrammetry technology has offered important technical support for high-fidelity modeling and scene simulation of digital twin cities. However, there are still numerous challenging issues that need to be addressed in existing digital twin city scene modeling and simulation technologies. For instance, existing automated 3D reconstruction methods for urban buildings are only capable of constructing building models at LOD2 (Level of Detail 2) level and are unable to automatically generate LOD3 (Level of Detail 3) models with complete building structures, while also exhibiting poor adaptability to complex structures. Furthermore, research on the reconstruction of urban vegetation and natural environment elements, which play a vital role in urban management processes, is lacking. The current 3D models of digital twin cities face limitations in element granularity and model accuracy, making them unsuitable for direct application to urban simulation calculations and simulations for real-world scene simulation applications.

Based on the aforementioned analysis, existing digital twin modeling and simulation technologies are inadequate in supporting fine-grained urban management and simulation applications. There is a pressing need for new technologies, theories, and methods to provide support in overcoming these challenges and enable the realization of digital twin cities that can effectively support fine-grained urban management and simulation applications.

This special issue invites submissions broadly contributing to "High-fidelity Urban 3D Modeling and Scene Simulation" using multi-source and multi-modal data acquired from various platforms.

The broad topics include (but are not limited to):
- High-precision 3D reconstruction of urban environment: Virtual reality, Data fusion, LiDAR scanning, Point cloud processing
- Semantic modeling and analysis of urban scenes: Semantic segmentation, Feature extraction, Contextual information, Sensor fusion, Urban scene understanding
- Real-time simulation and visualization of urban environments: Real-time rendering, Game engines, Virtual reality, Procedural generation
- Data-driven approaches for urban space modeling and analysis: Sensor networks, Artificial intelligence, Geospatial data analysis, Data mining
- Applications of high-fidelity urban space modeling in various fields: Transportation planning, Environmental modeling and analysis, Property management, Cultural heritage preservation, Urban planning and design

Schedule
Oct. 1, 2023 Submission system opening
Apr 30, 2024 Submission system closing

Format
All submissions will be peer reviewed according to the IEEE Geoscience and Remote Sensing Society guidelines. Submitted articles should not have been published or be under review elsewhere. Submit your manuscript on http://mc.manuscriptcentral.com/jstars, using the Manuscript Central interface and select the "**High-fidelity Urban 3D Modeling and Scene Simulation**" special issue manuscript type. Prospective authors should consult the site https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9082768 for guidelines and information on paper submission. All submissions must be formatted using the IEEE standard format (double column, single spaced). Please visit http://www.ieee.org/publications_standards/publications/authors/author_templates.html to download a template for transactions. Please note that as of Jan. 1, 2020, IEEE J-STARS has become a fully open-access journal charging a flat publication fee $1,250 per paper.

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