Advances in Civil Engineering

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Special Issue on

Smart and Resilient Infrastructure based on AI and Digital Twin

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As a supporting building block of urban basic functional services, infrastructure has a design service life which is often much higher than that of ordinary structures, due to its functional needs and capital cost. During such a long-term use life, the uncertainty of the environmental conditions of the infrastructure, such as daily use and extreme disaster effects, as well as the changes in the performance of the facility itself, have brought substantial challenges to the decision-making of operation and maintenance.

Digital Twin (DT) technology, as a key information technology rapidly developed by the manufacturing industry, has been approbated by experts in various fields, enterprises, and governments in recent years. Many scholars have become aware of the potential value of DT in the application of smart cities and smart buildings. DT can use the physical building model, the simulation process of using various sensors to obtain data in all directions and complete the mapping in the virtual space to reflect the full life cycle of the corresponding physical building or city. We have reason to believe that DT can help to explore and predict the real-time changes and development of infrastructure under daily use and extreme disasters by exploiting the real-time renewed building physical model rather than that of the design stage. However, as a preliminary exploration, applying DT to smart and resilient infrastructure will inevitably involve many challenges.

The aim of this Special Issue is to collect state-of-the-art research findings on the latest advances and challenges in the field of smart and resilient building based on AI and DT. High-quality reviews and original research papers that present current research gaps, theoretical frameworks, methodologies, and approaches are welcome.

Potential topics include but are not limited to the following:

- Technologies and approaches for digital twin creation and updating, i.e., BIM, laser scanning, photogrammetry, IoT, computer vision, AI, etc.
- Knowledge modeling of system engineering in infrastructure projects
- Modeling, simulation, evaluation, prediction in the design, construction, operation, and maintenance phases of infrastructure
- State of the art advances in resilient infrastructure
- Augmented Reality and Mixed Reality that improve the interactivity in digital twin applications

Authors can submit their manuscripts through the Manuscript Tracking System at https://review.hindawi.com/submit?specialIssue=841040.

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

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