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Concrete Structural Safety and Health Monitoring

Guest Editors:

Dr. Demi Ai
School of Civil and Hydraulic Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

Prof. Dr. Hongyou Cao
School of Civil Engineering and Architecture, Wuhan University of Technology, Wuhan 430070, China

Prof. Dr. Xiaowei Ye
Department of Civil Engineering, Zhejiang University, Hangzhou 310058, China

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Message from the Guest Editors

Common damages in concrete structures, such as cracks and corrosion caused by operational load or erosion environment, are usually of a small size and invisible at the initial stage. They will continuously accumulate and deteriorate the capacity of the structures or components and consequently pose a threat to structural safety. To this end, diverse structural damage detection and health monitoring techniques have been developed in recent decades. Those techniques, including global/local, static/dynamic, and destructive/nondestructive ones, facilitate the measurements of the loading/operating environment and the critical responses of the structure to track and estimate operational incidents, anomalies, and deterioration or damages. While the online, real-time, and in situ monitoring of concrete infrastructures still confronts with challenges of dealing with a considerable amount of data, inaccurate detection results, or labor-intensive cost, which motivates state-of-the-art technologies such as artificial intelligence.

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Editor-in-Chief

Prof. Dr. David Arditi
Construction Engineering and Management Program, Department of Civil, Architectural, and Environmental Engineering, Illinois Institute of Technology, 3201 South Dearborn Street, Chicago, IL 60616, USA

Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

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Buildings Editorial Office
MDPI, St. Alban-Anlage 66
4052 Basel, Switzerland

Tel: +41 61 683 77 34
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