Special Issue

Recent Advances in Structural Health Monitoring

Message from the Guest Editors

Structural health monitoring (SHM) is critical for ensuring the safety, resilience, and sustainability of civil infrastructure. Climate change and the global drive towards zero-carbon solutions further highlight the need for efficient monitoring strategies that optimize maintenance, extend service life, and reduce environmental impact. As structures become more complex and exposed to evolving risks, advancements in sensing technologies and data analytics are transforming SHM into a more intelligent and autonomous discipline. Recent developments in fiber-optic sensors, wireless networks, UAV-based inspections, and computer vision techniques have significantly improved real-time structural assessment. Meanwhile, machine learning is enabling automated damage and anomaly detection, predictive maintenance, and data-driven decision making. The integration of digital twins, data fusion techniques, and hybrid physics-based and data-driven approaches further enhances monitoring accuracy and operational efficiency.

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About the Journal

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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