

Special Issue

Advanced Structural Health Monitoring and Enhancement for Heritage Longevity

Message from the Guest Editors

This Special Issue of *Buildings* addresses the integration of advanced structural health monitoring (SHM) technologies and sustainable strengthening interventions to safeguard built cultural heritage against ageing, environmental degradation, and seismic or climatic risks. Recognizing the intrinsic value and vulnerability of heritage structures, this issue focuses on cutting-edge SHM solutions—such as sensor networks, digital twins, and AI-based damage detection—as well as compatible and reversible retrofitting strategies. We invite the submission of interdisciplinary research contributions that span material science, data analytics, engineering diagnostics, and architectural conservation. Emphasis will be placed on case studies and frameworks that showcase how real-time data collection and predictive maintenance can be leveraged to extend the service life of monuments, historic urban fabrics, and archeological remains. This Special Issue also encourages reflections on regulatory frameworks, risk-based decision-making, and the socio-cultural implications of digital monitoring in heritage practice.

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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.

Editor-in-Chief

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