

Special Issue on Structural Health Monitoring through Vibration-Based Approaches

CALL FOR PAPERS

Historic masonry structures are among the most vulnerable human constructions when natural disasters—hurricanes, tornadoes, floods, landslides, and earthquakes—strike a territory. The potential of these events to cause large-scale destruction and the intrinsic susceptibility of heritage structures make their structural health assessment of significant importance.

A promising means of assessing the safety of vulnerable structures is the application of vibration-based monitoring (VBM) systems. These allow the observation of the global response for a structure, including damage detection, classification, and progression. In fact, dynamic monitoring systems have proven to be particularly suited for cultural heritage structures such as palaces, churches, and towers, whose structural behaviors are strongly influenced by their geometric complexity and the nonlinearity and inhomogeneity of the masonry material. Moreover, because of its nondestructive and noninvasive nature, vibration-based monitoring can be safely applied to damaged structures, which are potentially dangerous under other test conditions. Thus, analysis of modal behavior can reveal structural weaknesses or deficiencies induced by a seismic event. In fact, monitoring of a set of appropriately chosen features and capturing the local and global structural weaknesses may reveal the effectiveness of safety and retrofitting interventions—as well as any progression in structural damage. Thanks to their noninvasive characteristics, VBM procedures are widely used in historic masonry structures, and several studies have addressed structural identification of cultural heritage using ambient vibration data.

This special issue aims to explore structural health monitoring via vibration-based approaches, especially for complex systems such as historic structures. In welcoming interdisciplinary studies from across several scientific communities—including engineering, numerical modeling, seismology, and geotechnics—we hope to present studies from the breadth of the field and provide insights into its future development.

We invite researchers to contribute original research, case studies, and review articles in the following main areas: (1) dynamic identification for model and data-driven approaches; (2) local and global damage detection; and (3) numerical, experimental, and physical modeling.

Potential topics include but are not limited to the following:

- ▶ Model-driven approaches in structural health monitoring
- ▶ Data-driven approaches in structural health monitoring
- ▶ Machine learning based structural health monitoring
- ▶ Damage detection, classification, or localization
- ▶ Operative approaches and case studies for data acquisition and signal processing
- ▶ Operational and experimental modal analysis
- ▶ Uncertainty quantification in structural health monitoring data (sensor accuracy, environmental and geometrical effects, etc.)
- ▶ Finite element procedures for structural health monitoring
- ▶ Soil-structure interaction in vibration-based monitoring

Special Issue Editors in Chief

Authors can submit their manuscripts through the Manuscript Tracking System at <https://mts.hindawi.com/submit/journals/sv/shmv/>.

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

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Submission Deadline

Friday, 25 May 2018

Publication Date

October 2018