

Special issue on New technologies in infrastructural health monitoring and preventive maintenance

Preface

In the past few years, the structural health monitoring (SHM) technology has been gained great advances in the aspects of theory developments and engineering practices. A significant number of long-term SHM systems have been designed and installed on large-scale civil infrastructures such as high-rise buildings, long-span bridges, marine structures, etc. With a huge amount of monitoring data obtained from the instrumented SHM system, many data-based structural condition assessment models and analysis approaches are developed to facilitate the in-service performance evaluation, safety status assessment, and remaining life prediction of target structures. Although tremendous progresses on SHM research and applications have been made over the past three decades, great efforts are still being devoted to coping with some challenges in this cutting-edge engineering field. For instance, development of superior strategies to bridge the gap between the SHM and the inspection and maintenance of civil infrastructures, establishment of robust methods to handle the high-level uncertainties inherent in the monitoring data during the execution of structural condition assessment and damage detection, and formulation of comprehensive frameworks to achieve more effective structural condition prognosis and health management with the aid of SHM techniques. A total of 12 papers reflecting the new technologies in infrastructural health monitoring and preventive maintenance are included in this special issue after a rigorous peer review process. The papers presented in this issue address the following SHM-relevant topics: structural damage detection, operational modal analysis and system identification, novel sensing technology development, and data-based condition and safety assessment.

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