

Structural Health Monitoring of Buildings and Infrastructure

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Abstract : Structures such as buildings, bridges, dams, wind turbines etc. need to be maintained against various factors such as deterioration, excessive loads, environment, temperature, etc. Choosing an appropriate monitoring system is important for determining any critical damage to a structure and address that to avoid any adverse consequence. Structural Health Monitoring (SHM) has emerged as an effective technique to monitor the health of the structures. SHM refers to an ongoing structural performance assessment using different kinds of sensors attached to or embedded in the structures to evaluate their integrity and safety to help engineers decide on rehabilitation measures. Ability of SHM in identifying the location and severity of structural damages by considering any changes in characteristics of the structures such as their frequency, stiffness and mode shapes helps engineers to monitor the structures and take the most effective corrective actions to maintain their safety and extend their service life. The main objective of this study is to review the overall SHM process specifically determining the natural frequency of an instrumented simply-supported concrete beam using modal testing and finite element model updating.

Keywords : structural health monitoring, natural frequency, modal analysis, finite element model updating

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