

Structural Health Monitoring

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The process of implementing a damage detection strategy for aerospace, civil and mechanical engineering infrastructure is referred to as *structural health monitoring* (SHM). The SHM process involves the observation of a system over time using response measurements from an array of sensors, the extraction of damage-sensitive features from these measurements, and the statistical analysis of these features to determine the current state of system health.

For long term SHM, the output of this process is periodically updated information regarding the current ability of the structure to perform its intended function. After extreme events, such as earthquakes or blast loading, SHM is used for rapid condition screening and aims to provide, in near real time, reliable information regarding the integrity of the structure.

To reflect the increasing interest in this emerging technology, there have been several new conferences developed in the last ten years that focus directly on SHM. These meetings have demonstrated that SHM is of interest to a wide range of industries and government agencies and also that many technical disciplines must be integrated to properly address the SHM problem. The conference proceedings have also shown that although significant knowledge and experiences have been gained through the reported studies, there currently exists no authoritative text.

This issue of *Phil Trans A* is therefore timely and will provide the engineering community with an up-to-date overview of this topic.

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