Structural Health Monitoring 2013: A Roadmap to Intelligent Structures

Description:

Original research on SHM sensors, quantification strategies, system integration and control for a wide range of engineered materials
New applications in robotics, machinery, as well as military aircraft, railroads, highways, bridges, pipelines, stadiums, tunnels, space exploration and energy production

Continuing a critical book series on structural health monitoring (SHM), this two-volume set (with full-text searchable CD-ROM) offers, as its subtitle implies, a guide to greater integration and control of SHM systems. Specifically, the volumes contain new research that will enable readers to more efficiently link sensor detection, diagnostics/quantification, overall system functionality, and automated, e.g., robotic, control, thus further closing the loop from inherent signal-based damage detection to responsive real-time maintenance and repair. SHM performance is demonstrated in monitoring the behavior of composites, metals, concrete, polymers and selected nanomaterials in a wide array of surroundings, including harsh environments, under extreme (e.g., seismic) loading and in space.

New information on smart sensors and network optimization is enhanced by novel statistical and model-based methods for signal processing and data quantification. A special feature of the book is its explanation of emerging control technologies.

Research in these volumes was initially presented in September 2013 at the 9th International Workshop on Structural Health Monitoring (IWSHM), held at Stanford University and sponsored by the Air Force Office of Scientific Research, the Army Research Laboratory, and the Office of Naval Research.

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