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| Nota di contenuto | Preface; Contents; Chapter 1. Structural Health Monitoring for Civil Infrastructure E.J. Cross, K. Worden and C.R. Farrar; 1. Introduction: SHM Ideology; 1.1. The aims of SHM; 1.2. Potential benefits of SHM; 1.3. Disambiguation: what SHM is not; 2. SHM in Practice; 2.1. Instrumentation for SHM; 2.2. Assessment of structural condition from measurements; 2.2.1. Feature Extraction; 2.2.2. Pattern Recognition for inference on structural condition from features; 2.3. Validation of SHM systems; 2.4. Fundamental axioms of SHM; 3. Civil Infrastructure and SHM; 4. Benchmarks; 4.1. The I-40 Bridge<br>4.2. The Steelquake Structure4.3. The Z24 Bridge; 5. Case Study: Z24 Bridge; 6. Continuing Challenges in SHM; Acknowledgments; References; Chapter 2. Enhanced Damage Locating Vector Method for Structural Health Monitoring S. T. Quek, V. A. Tran, and N. N. K. Lee; 1. The DLV Method Introduction; 1.1. General concept; 1.2. Normalized cumulative energy (NCE); 2. Identifying Actual Damage Elements; 2.1. Intersection scheme; 3. Formulation of Flexibility Matrix at Sensor Location; 3.1. Forming flexibility matrix using static responses; 3.1.1. Static responses with load of known magnitude<br>3.1.2. Static responses with load of unknown magnitude3.2. Forming |

flexibility matrix using dynamic responses; 3.2.1. Dynamic responses with known excitation; 3.2.2. Dynamic responses with unknown excitation; 4. Lost Data Reconstruction for Wireless Sensors; 4.1. Lost data reconstruction algorithm; 5. Numerical and Experimental Examples; 5.1. Numerical example: 2-D warehouse frame structure; 5.2. Experimental example: 3-D modular truss structure; 6. Concluding Remarks; References; Chapter 3. Dynamics-based Damage Identification Pizhong Qiao and Wei Fan; 1. Introduction
2. Damage Identification Algorithms2.1 Literature review; 2.2 Two-dimensional Gapped Smoothing Method (GSM); 2.3 Strain Energy-based Damage Index Method (DIM); 2.4 Uniform Load Surface (ULS); 2.5 Generalized Fractal Dimension (GFD); 3. Comparative Study; 3.1 Geometry of the composite plate; 3.2 Numerical analysis; 3.3 Damage identification based on numerical data; 3.4 Experimental program; 3.5 Damage identification based on experimental data; 4. Summary and Conclusions; Acknowledgements; References
Chapter 4. Simulation Based Methods for Model Updating in Structural Condition Assessment H. A. Nasrellah, B. Radhika, V. S. Sundar, and C. S. Manohar1. Introduction; 2. Statically loaded structures: MCMC based methods; 3. Dynamically loaded structures: sequential Monte Carlo approach; 3.1 Hidden state estimation; 3.2 Combined state and force identification; 3.3 Combined state and parameter estimation; 3.3.1 Method of augmented states and global iterations; 3.3.2 Method of maximum likelihood; 3.3.3 Bank of filter approach; 3.3.4 Combined MCMC and Bayesian filters
3.4 Other classes of updating problems

Sommario/riassunto

Health Assessment of Engineered Structures has become one of the most active research areas and has attracted multi-disciplinary interest. Since available financial recourses are very limited, extending the lifespan of existing bridges, buildings and other infrastructures has become a major challenge to the engineering profession world-wide. Some of its related areas are only in their development phase. As the study of structural health assessment matures, more new areas are being identified to complement the concept. This book covers some of the most recent developments (theoretical and exper