

1. Record Nr.	UNINA9910143554203321
Titolo	Damage prognosis for aerospace, civil and mechanical systems [[electronic resource] /] / edited by Daniel J. Inman ... [et al.]
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : Wiley, c2005
ISBN	1-280-28789-6 9786610287895 0-470-30056-6 0-470-86909-7 0-470-86908-9
Descrizione fisica	1 online resource (471 p.)
Altri autori (Persone)	InmanD. J
Disciplina	624.1/71 624.171
Soggetti	Structural analysis (Engineering) Materials - Deterioration Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Damage Prognosis; Contents; List of Contributors; Preface; 1 An Introduction to Damage Prognosis; 1.1 Introduction; 1.2 The Damage-Prognosis Solution Process; 1.3 Motivation for Damage-Prognosis Solutions; 1.4 Disciplines Needed to Address Damage Prognosis; 1.5 Summary; References; Part I Damage Models; 2 An Overview of Modeling Damage Evolution in Materials; 2.1 Introduction; 2.2 Overview of General Modeling Issues; 2.3 Characterization of Material Behavior: Damage Initiation and Evolution; 2.4 Material Modeling: General Considerations and Preliminary Concepts 2.5 Classical Damage-Modeling Approaches 2.6 Phenomenological Constitutive Modeling; 2.7 Micromechanical Modeling of Materials; 2.8 Summary; References; 3 In Situ Observation of Damage Evolution and Fracture Toughness Measurement by SEM; 3.1 Overview of Fracture Mechanics Related to Damage Prognosis; 3.2 In Situ Observation of Damage Evolution and Fracture Toughness Measurement; 3.3 Concluding remarks; Acknowledgements; References; 4 Predictive

Modeling of Crack Propagation Using the Boundary Element Method; 4.1 Introduction; 4.2 Damage and Fracture Mechanics Theories 4.3 Boundary Element Fracture Mechanics 4.4 Predictive Modeling of Crack Propagation; 4.5 Numerical Results; 4.6 Conclusions; Acknowledgments; References; 5 On Friction Induced Nonideal Vibrations: A Source of Fatigue; 5.1 Preliminary Remarks; 5.2 Nonlinear Dynamics of Ideal and Nonideal Stick-Slip Vibrations; 5.3 Switching Control for Ideal and Nonideal Stick-Slip Vibrations; 5.4 Some Concluding Remarks; Acknowledgments; References; 6 Incorporating and Updating of Damping in Finite Element Modeling; 6.1 Introduction; 6.2 Theoretical Fundamentals; 6.3 Application; 6.4 Conclusion; References
Part II Monitoring Algorithms
7 Model-Based Inverse Problems in Structural Dynamics; 7.1 Introduction; 7.2 Theory of Discrete Vibrating Systems; 7.3 Response Sensitivity; 7.4 Finite-Element Model Updating; 7.5 Review of Classical Optimization Techniques; 7.6 Heuristic Optimization Methods; 7.7 Multicriteria Optimization; 7.8 General Optimization Scheme for Inverse Problems in Engineering; 7.9 Applications; Acknowledgments; References; 8 Structural Health Monitoring Algorithms for Smart Structures; 8.1 Initial Considerations about SHM
8.2 Optimal Placement of Sensors and Actuators for Smart Structures
8.3 Proposed Methodology; 8.4 Artificial Neural Network as a SHM Algorithm; 8.5 Genetic Algorithms as a SHM Algorithm; 8.6 Conclusion; References; 9 Uncertainty Quantification and the Verification and Validation of Computational Models; 9.1 Introduction; 9.2 Verification Activities; 9.3 Validation Activities; 9.4 Uncertainty Quantification; 9.5 Assessment of Prediction Accuracy; 9.6 Conclusion; References; 10 Reliability Methods; 10.1 Introduction; 10.2 Reliability Assessment; 10.3 Approximation of the Probability of Failure
10.4 Decision Making

Sommario/riassunto

Damage prognosis is a natural extension of damage detection and structural health monitoring and is forming a growing part of many businesses. This comprehensive volume presents a series of fundamental topics that define the new area of damage prognosis. Bringing together essential information in each of the basic technologies necessary to perform damage prognosis, it also reflects the highly interdisciplinary nature of the industry through the extensive referencing of each of the component disciplines. Taken from lectures given at the Pan American Advanced Studies Institute in Damage Pro
