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Soggetti	Partial differential equations Applied mathematics Engineering mathematics Vibration Dynamical systems Dynamics Mechanics Mechanics, Applied Calculus of variations Probabilities Partial Differential Equations Mathematical and Computational Engineering Vibration, Dynamical Systems, Control Solid Mechanics Calculus of Variations and Optimal Control; Optimization Probability Theory and Stochastic Processes
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Nota di contenuto	1 Introduction -- 2 Mathematical Preliminaires -- 3 Mathematical Analysis of Optimal Control Problems Under Uncertainty -- 4 Numerical Resolution of Robust Optimal Control Problems -- 5 Numerical Resolution of Risk Averse Optimal Control Problems -- 6 Structural Optimization Under Uncertainty -- 7 Miscellaneous Topics and Open

Problems.

Sommario/riassunto

This book provides a direct and comprehensive introduction to theoretical and numerical concepts in the emerging field of optimal control of partial differential equations (PDEs) under uncertainty. The main objective of the book is to offer graduate students and researchers a smooth transition from optimal control of deterministic PDEs to optimal control of random PDEs. Coverage includes uncertainty modelling in control problems, variational formulation of PDEs with random inputs, robust and risk-averse formulations of optimal control problems, existence theory and numerical resolution methods. The exposition focusses on the entire path, starting from uncertainty modelling and ending in the practical implementation of numerical schemes for the numerical approximation of the considered problems. To this end, a selected number of illustrative examples are analysed in detail throughout the book. Computer codes, written in MatLab, are provided for all these examples. This book is addressed to graduate students and researchers in Engineering, Physics and Mathematics who are interested in optimal control and optimal design for random partial differential equations.
