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ISBN	3-031-49208-0
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (282 pages)
Disciplina	620.0042
Soggetti	Mathematical optimization Engineering design Operations research Technological innovations Algorithms Optimization Engineering Design Operations Research and Decision Theory Innovation and Technology Management Design and Analysis of Algorithms
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Basic Concepts of Probability Theory -- Uncertainty Modeling -- Reliability Analysis Methods for Time-Independent Problems -- Surrogate Modeling for Reliability Analysis -- Model verification and validation (V&V) -- Time-variant reliability analysis methods -- Reliability-based design optimization (RBDO) -- Robust design optimization (RDO) -- Other methods of design optimization under uncertainty -- Engineering applications.
Sommario/riassunto	This book introduces the fundamental concepts of probability and reliability, the classical methods of uncertainty modelling, time-dependent and time-independent reliability analysis methods, model verification and validation, two main categories of design optimization under uncertainty (DOUU) methods (e.g., reliability-based design optimization and robust design optimization), the state-of-the-art

approaches of physics informed methods for DOUU, and a comprehensive survey of engineering applications of DOUU. Each chapter begins with the fundamental theories and methods in a lucid, is easy-to-follow treatment, then elaborates on the corresponding advanced approaches using detailed methodologies, mathematical models, numerical examples, tables, and graphs. References and exercises are presented at the end of chapters. The book is ideal for both educational and research needs for readers from undergraduate students, graduate students, and faculty to engineering designers. Offers both the fundamental and the state-of-the-art theories and methods of design optimization under uncertainty; Explains the in-depth theories of design optimization under uncertainty in a lucid with step-by-step derivation; Introduces the exercise problems using graphics, tables, and results that are all originally developed.