Record Nr. UNINA9910132212403321 Autore Lemaire Maurice Titolo Mechanics and uncertainty / / Maurice Lemaire Pubbl/distr/stampa London; ; Hoboken, New Jersey:,: ISTE:,: Wiley,, 2014 ©2014 **ISBN** 1-118-93105-X 1-118-93103-3 1-118-93104-1 Descrizione fisica 1 online resource (169 p.) Collana Mechanical Engineering and Solid Mechanics Series Disciplina 624,171 Soggetti Structural analysis (Engineering) Structural optimization Uncertainty (Information theory) 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 Cover; Title Page; Contents; Foreword; Preface; Introduction; Chapter 1. Understanding Uncertainty; 1.1. Uncertainty and reality; 1.1.1. Awareness of uncertainty; 1.1.2. Territories of uncertainty; 1.1.3. Conclusion; 1.2. Robustness and reliability; 1.2.1. Robustness; 1.2.2. Reliability: 1.2.3. Relationship between robustness and reliability: 1.2.4. Optimizing robustness and reliability; 1.2.5. Conclusion; 1.3. Designing for robust production; 1.3.1. Robustness and lifecycles; 1.3.2. Description of the V cycle; 1.3.3. Uncertainty in the V cycle 1.3.4. Uncertainty linked to a step in the V cycle1.3.5. Robustness and uncertainty; 1.3.6. Conclusion; Chapter 2. Modeling Uncertainty; 2.1. Random uncertainty; 2.1.1. Modeling uncertainty; 2.1.2. Exploration of Mediocristan; 2.1.3. From statistics to probabilities; 2.1.4. Polynomial chaos; 2.1.5. Exploration of Extremistan; 2.1.6. Conclusion; 2.2. Uncertainty in behavior models; 2.2.1. Uncertainty and input data; 2.2.2. Uncertainty in behavior models; 2.3. Uncertainty propagation; 2.3.1. The problem of uncertainty propagation; 2.3.2. Analyzing sensitivity to uncertainty 2.3.3. Reliability analysis - classification methods2.3.4. Model

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Science is a quest for certainty, but lack of certainty is the driving force behind all of its endeavors. This book, specifically, examines the uncertainty of technological and industrial science. Uncertainty and Mechanics studies the concepts of mechanical design in an uncertain setting and explains engineering techniques for inventing cost-effective products. Though it references practical applications, this is a book about ideas and potential advances in mechanical science.