1. Record Nr.   UNINA9910349332003321

   Autore   Ikeda Kiyohiro

   Titolo   Imperfect Bifurcation in Structures and Materials : Engineering Use of Group-Theoretic Bifurcation Theory / / by Kiyohiro Ikeda, Kazuo Murota

   Pubbl/distr/stampa   Cham : , : Springer International Publishing : , : Imprint : Springer, , 2019

   ISBN   3-030-21473-7

   Edizione   [3rd ed. 2019.]

   Descrizione fisica   1 online resource (XXV, 590 p. 239 illus., 33 illus. in color.)

   Collana   Applied Mathematical Sciences, , 2196-968X ; ; 149

   Disciplina   515.35
                       519

   Soggetti   System theory
                       Control theory
                       Control engineering
                       Engineering mathematics
                       Engineering - Data processing
                       Dynamical systems
                       Mechanics, Applied
                       Solids
                       Systems Theory, Control
                       Control and Systems Theory
                       Mathematical and Computational Engineering Applications
                       Dynamical Systems
                       Solid Mechanics

   Lingua di pubblicazione   Inglese

   Formato   Materiale a stampa

   Livello bibliografico   Monografia

   Nota di bibliografia   Includes bibliographical references and index.

   Nota di contenuto   Overview of Book -- Imperfect Behavior at Simple Critical Points -- Critical Points and Local Behavior -- Imperfection Sensitivity Laws -- Worst Imperfection (I) -- Random Imperfection (I) -- Experimentally Observed Bifurcation Diagrams -- Imperfect Bifurcation of Symmetric Systems -- Group-Theoretic Bifurcation Theory -- Bifurcation Behavior of Dn-Equivariant Systems -- Worst Imperfection (II) -- Random Imperfection (II) -- Description and Computation of Bifurcation

Behaviors -- Efficient Transformation for Block-Diagonalization -- Modeling of Bifurcation Phenomena -- Bifurcation of Cylindrical Sand Specimens -- Echelon-Mode Formation -- Bifurcation of Steel Specimens -- Flower Patterns on Honeycomb Structures -- Answers to Problems.

Sommario/riassunto	This book provides a modern static imperfect bifurcation theory applicable to bifurcation phenomena of physical and engineering problems and fills the gap between the mathematical theory and engineering practice. Systematic methods based on asymptotic, probabilistic, and group theoretic standpoints are used to examine experimental and computational data from numerous examples, such as soil, sand, kaolin, honeycomb, and domes. For mathematicians, static bifurcation theory for finite-dimensional systems, as well as its applications for practical problems, is illuminated by numerous examples. Engineers may find this book, with its minimized mathematical formalism, to be a useful introduction to modern bifurcation theory. This third edition strengthens group representation and group-theoretic bifurcation theory. Several large scale applications have been included in association with the progress of computational powers. Problems and answers have been provided. Review of First Edition: "The book is unique in considering the experimental identification of material-dependent bifurcations in structures such as sand, Kaolin (clay), soil and concrete shells. … These are studied statistically. … The book is an excellent source of practical applications for mathematicians working in this field. … A short set of exercises at the end of each chapter makes the book more useful as a text. The book is well organized and quite readable for non-specialists." Henry W. Haslach, Jr., Mathematical Reviews, 2003.