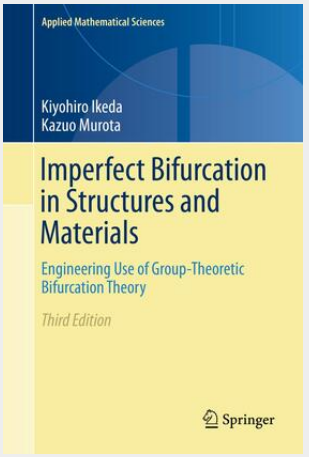
Murota / Ikeda

Imperfect Bifurcation in Structures and Materials

Engineering Use of Group-Theoretic Bifurcation Theory



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

The ?rst edition of this book was published in 2002 for an audience of applied mathematicians and engineers. The response to the ?rst edition, represented by sev eral book reviews, has been most heartening. Accordingly, the second edition of this book maintains its major framework and serves as an expanded revision of our previous work. In the second edition, the theoretical backgrounds of group representation the ory are strengthened and made self contained, in response to a request of a book reviewer and students of the authors. Based on these strengthened backgrounds, a theory and a numerical procedure on block diagonalization are presented. Among a number of methodologies, block diagonalization analysis has come to be acknowl edged as a systematic and rigorous procedure for symmetry exploitation for the following two purposes: • Gain better insight into bifurcation behaviors via blockwise singularity detection. • Enhance the computational e?ciency and accuracy of the numerical analysis.

80,24 €
74,99 € (zzgl. MwSt.)

Lieferfrist: bis zu 10 Tage

Artikelnummer: 9783030214722
Medium: Buch
ISBN: 978-3-030-21472-2
Verlag: Springer International Publishing
Erscheinungstermin: 07.10.2019
Sprache(n): Englisch
Auflage: 3rd Auflage 2019
Serie: Applied Mathematical Sciences
Produktform: Gebunden
Gewicht: 1080 g
Seiten: 590
Format (B x H): 160 x 241 mm