1. Record Nr. UNINA9910299831103321

Titolo	Analysis and Control of Complex Dynamical Systems : Robust Bifurcation, Dynamic Attractors, and Network Complexity / / edited by Kazuyuki Aihara, Jun-ichi Imura, Tetsushi Ueta
Pubbl/distr/stampa	Tokyo : , : Springer Japan : , : Imprint : Springer, , 2015
ISBN	4-431-55013-5
Edizione	[1st ed. 2015.]
Descrizione fisica	1 online resource (215 p.)
Collana	Mathematics for Industry, , 2198-350X ; ; 7
Disciplina	629.8
Soggetti	Vibration Dynamical systems Dynamics Computational complexity Physics System theory Vibration, Dynamical Systems, Control Complexity Applications of Graph Theory and Complex Networks Complex Systems
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 at the end of each chapters and index.
Nota di contenuto	Part I Robust Bifurcation and Control -- Dynamic Robust Bifurcation Analysis -- Robust Bifurcation Analysis Based on Degree of Stability -- Use of a Matrix Inequality Technique for Avoiding Undesirable Bifurcation -- A Method for Constructing a Robust System Against Unexpected Parameter Variation -- Parametric Control to Avoid Bifurcation Based on Maximum Local Lyapunov Exponent -- Threshold Control for Stabilization of Unstable Periodic Orbits in Chaotic Hybrid Systems -- Part II Dynamic Attractor and Control -- Chaotic Behavior of Orthogonally Projective Triangle Folding Map -- Stabilization Control of Quasi-Periodic Orbits -- Feedback Control Method Based on Predicted Future States for Controlling Chaos -- Ultra-Discretization of Nonlinear Control System with Spatial Symmetry -- Feedback Control of Spatial

Patterns in Reaction-Diffusion System -- Control of Unstabilizable Switched Systems -- Part III Complex Networks and Modeling for Control -- Clustered Model Reduction of Large-Scale Bidirectional Networks -- Network Structure Identification from a Small Number of Inputs/Outputs.

Sommario/riassunto

This book is the first to report on theoretical breakthroughs on control of complex dynamical systems developed by collaborative researchers in the two fields of dynamical systems theory and control theory. As well, its basic point of view is of three kinds of complexity: bifurcation phenomena subject to model uncertainty, complex behavior including periodic/quasi-periodic orbits as well as chaotic orbits, and network complexity emerging from dynamical interactions between subsystems. Analysis and Control of Complex Dynamical Systems offers a valuable resource for mathematicians, physicists, and biophysicists, as well as for researchers in nonlinear science and control engineering, allowing them to develop a better fundamental understanding of the analysis and control synthesis of such complex systems.