Contents

Part I Theoretical Methods

1 Controlling Chimera Patterns in Networks: Interplay of Structure, Noise, and Delay ................. 3
   Anna Zakharova, Sarah A.M. Loos, Julien Siebert, Aleksandar Gjurchinovski, Jens Christian Claussen
   and Eckehard Schöll

2 Dynamics of Fully Coupled Rotators with Unimodal and Bimodal Frequency Distribution ............... 25
   Simona Olmi and Alessandro Torcini

3 Adaptively Controlled Synchronization of Delay-Coupled Networks ............................................. 47
   Philipp Hövel, Judith Lehnert, Anton Selivanov, Alexander Fradkov and Eckehard Schöll

4 Controlling Oscillations in Nonlinear Systems with Delayed Output Feedback ............................ 65
   Fatihcan M. Atay

5 Global Effects of Time-Delayed Feedback Control Applied to the Lorenz System ........................ 81
   Anup S. Purewal, Bernd Krauskopf and Claire M. Postlethwaite

6 Symmetry-Breaking Control of Rotating Waves ...................... 105
   Isabelle Schneider and Bernd Fiedler

7 On the Interplay of Noise and Delay in Coupled Oscillators ....... 127
   Otti D’Huys, Thomas Jüngling and Wolfgang Kinzel

8 Noisy Dynamical Systems with Time Delay: Some Basic Analytical Perturbation Schemes with Applications ........ 147
   Wolfram Just, Paul M. Geffert, Anna Zakharova and Eckehard Schöll
9 Study on Critical Conditions and Transient Behavior in Noise-Induced Bifurcations ........................................... 169
   Zigang Li, Kongming Guo, Jun Jiang and Ling Hong

10 Analytical, Optimal, and Sparse Optimal Control of Traveling Wave Solutions to Reaction-Diffusion Systems .................. 189
   Christopher Ryll, Jakob Löber, Steffen Martens, Harald Engel and Fredi Tröltzsch

11 Recent Advances in Reaction-Diffusion Equations with Non-ideal Relays ...................................................... 211
   Mark Curran, Pavel Gurevich and Sergey Tikhomirov

12 Deriving Effective Models for Multiscale Systems via Evolutionary Γ-Convergence ........................................ 235
   Alexander Mielke

13 Moment Closure—A Brief Review .................................. 253
   Christian Kuehn

Part II  Concepts of Applications

14 Feedback Control in Quantum Transport ......................... 275
   Clive Emary

15 Controlling the Stability of Steady States in Continuous Variable Quantum Systems ........................................ 289
   Philipp Strasberg, Gernot Schaller and Tobias Brandes

16 Chimera States in Quantum Mechanics .......................... 315
   Victor Manuel Bastidas, Iryna Omelchenko, Anna Zakharova, Eckehard Schöll and Tobias Brandes

17 Multirhythmicity for a Time-Delayed FitzHugh-Nagumo System with Threshold Nonlinearity ............................ 337
   Lionel Weicker, Lars Keuninckx, Gaetan Friart, Jan Danckaert and Thomas Erneux

18 Exploiting Multistability to Stabilize Chimera States in All-to-All Coupled Laser Networks ............................. 355
   Fabian Böhm and Kathy Lüdge

19 Feedback Control of Colloidal Transport ........................ 375
   Robert Gernert, Sarah A.M. Loos, Ken Lichtner and Sabine H.L. Klapp

20 Swarming of Self-propelled Particles on the Surface of a Thin Liquid Film .................................................... 393
   Andrey Pototsky, Uwe Thiele and Holger Stark
21 Time-Delayed Feedback Control of Spatio-Temporal
Self-Organized Patterns in Dissipative Systems ................. 413
Alexander Kraft and Svetlana V. Gurevich

22 Control of Epidemics on Hospital Networks ................... 431
Vitaly Belik, Philipp Hövel and Rafael Mikolajczyk

23 Intrinsic Control Mechanisms of Neuronal Network Dynamics .... 441
Josef Ladenbauer, Moritz Augustin and Klaus Obermayer

24 Evolutionary Dynamics: How Payoffs and Global Feedback
Control the Stability .............................................. 461
Jens Christian Claussen

Index ............................................................................. 471
Control of Self-Organizing Nonlinear Systems
Schöll, E.; Klapp, S.H.L.; Hövel, P. (Eds.)
2016, XVII, 475 p. 159 illus., 117 illus. in color.,
Hardcover
ISBN: 978-3-319-28027-1