

1. Record Nr.	UNINA9910144116403321
Titolo	Handbook of chaos control // edited by Eckehard Scholl and Heinz Georg Schuster
Pubbl/distr/stampa	Weinheim, [Germany] : , : Wiley-VCH Verlag GmbH & Co. KGaA, , 2008 ©2008
ISBN	1-281-94681-8 9786611946814 3-527-62231-4 3-527-62232-2
Edizione	[2nd ed.]
Descrizione fisica	1 online resource (851 p.)
Disciplina	003.857 003/.857
Soggetti	Nonlinear control theory Chaotic behavior in 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	Handbook of Chaos Control; Contents; Preface; List of Contributors; Part I Basic Aspects and Extension of Methods; 1 Controlling Chaos; 1.1 Introduction; 1.2 The OGY Chaos Control; 1.3 Targeting-Steering Chaotic Trajectories; 1.3.1 Part I: Finding a Proper Trajectory; 1.3.2 Part II: Finding a Pseudo-Orbit Trajectory; 1.3.3 The Targeting Algorithm; 1.4 Applying Control of Chaos and Targeting Ideas; 1.4.1 Controlling an Electronic Circuit; 1.4.2 Controlling a Complex System; 1.5 Conclusion; References; 2 Time-Delay Control for Discrete Maps; 2.1 Overview: Why Study Discrete Maps? 2.2 Theme and Variations2.2.1 Rudimentary Time-Delay Feedback; 2.2.2 Extending the Domain of Control; 2.2.3 High-Dimensional Systems; 2.3 Robustness of Time-Delay Stabilization; 2.4 Summary; Acknowledgments; References; 3 An Analytical Treatment of the Delayed Feedback Control Algorithm; 3.1 Introduction; 3.2 Proportional Versus Delayed Feedback; 3.3 Controlling Periodic Orbits Arising from a Period Doubling Bifurcation; 3.3.1 Example: Controlling the Rossler

System; 3.4 Control of Forced Self-Sustained Oscillations; 3.4.1 Problem Formulation and Averaged Equation 3.4.2 Periodic Orbits of the Free System 3.4.3 Linear Stability of the System Controlled by Delayed Feedback; 3.4.4 Numerical Demonstrations; 3.5 Controlling Torsion-Free Periodic Orbits; 3.5.1 Example: Controlling the Lorenz System at a Subcritical Hopf Bifurcation; 3.6 Conclusions; References; 4 Beyond the Odd-Number Limitation of Time-Delayed Feedback Control; 4.1 Introduction; 4.2 Mechanism of Stabilization; 4.3 Conditions on the Feedback Gain; 4.4 Conclusion; Acknowledgments; Appendix: Calculation of Floquet Exponents; References; 5 On Global Properties of Time-Delayed Feedback Control 5.1 Introduction 5.2 A Comment on Control and Root Finding Algorithms; 5.3 Codimension-Two Bifurcations and Basins of Attraction; 5.3.1 The Transition from Super- to Subcritical Behavior; 5.3.2 Probing Basins of Attraction in Experiments; 5.4 A Case Study of Global Features for Time-Delayed Feedback Control; 5.4.1 Analytical Bifurcation Analysis of One-Dimensional Maps; 5.4.2 Dependence of Sub- and Supercritical Behavior on the Observable; 5.4.3 Influence of the Coupling of the Control Force; 5.5 Conclusion; Acknowledgments; Appendix A Normal Form Reduction Appendix B Super- and Subcritical Hopf Bifurcation for Maps References; 6 Poincare-Based Control of Delayed Measured Systems: Limitations and Improved Control; 6.1 Introduction; 6.1.1 The Delay Problem-Time-Discrete Case; 6.1.2 Experimental Setups with Delay; 6.2 Ott-Grebogi-Yorke (OGY) Control; 6.3 Limitations of Unmodified Control and Simple Improved Control Schemes; 6.3.1 Limitations of Unmodified OGY Control in the Presence of Delay; 6.3.2 Stability Diagrams Derived by the Jury Criterion; 6.3.3 Stabilizing Unknown Fixed Points: Limitations of Unmodified Difference Control 6.3.4 Rhythmic Control Schemes: Rhythmic OGY Control

Sommario/riassunto

This long-awaited revised second edition of the standard reference on the subject has been considerably expanded to include such recent developments as novel control schemes, control of chaotic space-time patterns, control of noisy nonlinear systems, and communication with chaos, as well as promising new directions in research. The contributions from leading international scientists active in the field provide a comprehensive overview of our current level of knowledge on chaos control and its applications in physics, chemistry, biology, medicine, and engineering. In addition, they show the ove
