1. Record Nr. UNINA9910512309303321

Titolo	Chaotic systems with multistability and hidden attractors / / Xiong Wang, Nikolay V. Kuznetsov, Guanrong Chen, editors
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-75821-4
Descrizione fisica	1 online resource (661 pages)
Collana	Emergence, complexity and computation ; ; Volume 40
Disciplina	003.857
Soggetti	Chaotic behavior in systems Caos (Teoria de sistemes) Chaos Computational complexity Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Intro -- Preface -- Contents -- Part I -- Introduction -- 1 Classical Chaotic Systems -- 1.1 Lorenz System -- 1.2 Rössler System -- 1.3 Chua's Circuit -- 1.4 Chen System -- 2 Šil'nikov Theory -- 3 Chaos beyond Šil'nikov -- 4 Hidden Attractors and Multi-Stability -- 4.1 Hidden Attractors -- 4.2 Multi-Stability -- 5 Organization of the Book -- 5.1 Classical Šil'nikov Chaos -- 5.2 Chaotic Systems with Various Equilibria -- 5.3 Chaotic Systems with Various Components -- 5.4 Multi-Stability in Various Systems with Different Characteristics -- 5.5 Various Theoretical Advances and Potential Applications -- 5.6 Discussions and Perspectives -- References -- Šil'nikov Theorem -- 1 Dynamics in the Neighborhood of a Homoclinic Loop to a Saddle-Focus -- 2 Dynamics in the Neighborhood of a Heteroclinic Loop of the Simple Type -- 3 Simplest Form of the Šil'nikov Theorem -- References -- Part II -- Chaotic Systems with Stable Equilibria -- 1 Introduction -- 2 Motivation -- 3 First Example on Chaos with One Stable Equilibrium -- 4 More Examples of Chaotic Systems with One Stable Equilibrium -- 4.1 Wei System -- 4.2 Multiple-delayed Wang-Chen System -- 4.3 Lao System -- 4.4 Kingni System -- 4.5 From an Infinite Number of

Equilibria to Only One Stable Equilibrium -- 5 Systematic Search for Chaotic Systems with One Stable Equilibrium -- 5.1 Jerk System -- 5.2 17 Simple Chaotic Flows -- 6 Chaos with Stable Equilibria -- 6.1 Yang-Chen System -- 6.2 Yang-Wei System -- 6.3 Delayed Feedback of Yang-Wei System -- 6.4 More Examples -- References -- Chaotic Systems Without Equilibria -- 1 Introduction -- 2 Examples That Have Been Discovered -- 2.1 Sprott A System -- 2.2 Wei System -- 2.3 Wang-Chen System -- 2.4 Maaita System -- 2.5 Akgul System -- 2.6 Pham System -- 2.7 Wang System -- 3 Systematic Approach for Finding Chaotic Systems Without Equilibria.
4 Multi-scroll Attractors in Chaotic Systems Without Equilibria -- 4.1 Jafari System -- 4.2 Hu System -- References -- Chaotic Systems with Curves of Equilibria -- 1 Introduction -- 2 Constructing a Chaotic System with Infinite Equilibria -- 3 Chaotic Systems with Lines of Equilibria -- 3.1 LE System and a General Equation -- 3.2 SL System -- 3.3 AB System -- 3.4 STR System -- 3.5 IE System -- 3.6 CE System -- 3.7 Petrzela-Gotthans System -- 4 Chaotic Systems with Closed-Curves of Equilibria -- 4.1 Circular Curve of Equilibria -- 4.2 Square Curve of Equilibria -- 4.3 Ellipse Curves of Equilibria -- 4.4 Rectangle Shape -- 4.5 Rounded-Square Curves of Equilibria -- 4.6 Cloud Curves of equilibria -- 5 Open Curves of Equilibria -- References -- Chaotic Systems with Surfaces of Equilibria -- 1 Introduction -- 2 Systematic Method for Finding Chaotic Systems with Surfaces of Equilibria -- 3 Twelve Cases: ES Systems -- References -- Chaotic Systems with Any Number and Various Types of Equilibria -- 1 Introduction -- 2 Chaotic Systems with Any Desired Number of Equilibria -- 2.1 A Modified Sprott E System with One Stable Equilibrium -- 2.2 Chaotic System with Two Equilibria -- 2.3 Chaotic System with Three Equilibria -- 2.4 Constructing a Chaotic System with Any Number of Equilibria -- 3 Chaotic Systems with Any Type of Equilibria -- 3.1 System with No Equilibria -- 3.2 Hyperbolic Examples -- 3.3 Non-Hyperbolic Systems -- 4 Conclusions -- References -- Part III -- Hyperchaotic Systems with Hidden Attractors -- 1 Introduction -- 2 Hyperchaotic Systems with No Equilibria -- 2.1 Example 1 -- 2.2 Example 2 -- 3 Hyperchaotic Systems with a Limited Number of Equilibria -- 3.1 Hyperchaotic System with One Equilibrium -- 3.2 Hyperchaotic System with Two Equilibria -- 3.3 Hyperchaotic System with Three Equilibria.
3.4 Hyperchaotic Systems with Limited Number of Equilibria -- 4 Hyperchaotic Systems with Lines or Curves of Equilibria -- 4.1 Example 1 -- 4.2 Example 2 -- 5 Hyperchaotic Systems with Plane or Surface of Equilibria -- 5.1 Example 1 -- 5.2 Example 2 -- 6 Coexistence of Different Attractors -- 6.1 Coexistence of Chaotic Attractors with No Equilibria -- 6.2 Coexistence of Attractors with a Limited Number of Equilibria -- 6.3 Coexistence of Attractors with Lines or Curves of Equilibria -- 6.4 Coexistence of Attractors with a Plane of Equilibria -- References -- Fractional-Order Chaotic Systems with Hidden Attractors -- 1 Introduction -- 2 Classical Fractional-Order Chaotic Systems -- 2.1 Fractional-order Chua's Circuit -- 2.2 Fractional-Order Lorenz System -- 2.3 Fractional-Order Chen System -- 2.4 Fractional-order Lü System -- 2.5 Fractional-Order Rössler System -- 2.6 Fractional-Order Liu System -- 2.7 Fractional-Order System with Multi-Scroll Attractors -- 3 Fractional-Order Chaotic System with a Limited Number of Equilibria -- 3.1 3D Examples -- 3.2 4D Examples -- 4 Fractional-Order Systems with an Infinite Number of Equilibria -- 5 Fractional-Order Systems with Stable Equilibria -- 5.1 Lorenz-like system with Two Stable Node-foci -- 5.2 A Chaotic System with One Stable Equilibrium -- 6 Fractional-Order Systems without Equilibria -- 6.1 3D Examples -- 6.2 4D Examples -- References -- Memristive Chaotic

Systems with Hidden Attractors -- 1 Introduction -- 2 Memristive Chua-Like Circuits -- 2.1 Memristive Chua's Circuit -- 2.2 Modified Memristive Chua's Circuit -- 2.3 Memristive Self-oscillating Circuit -- 3 Memristive Hyperjerk Circuit -- 4 Hidden Attractors in Memristive Hyperchaotic Systems -- 4.1 4D Memristive Hyperchaotic System -- 4.2 5D Memristive Hyperchaotic Systems -- 5 Hidden Multi-scroll/Multi-wing Attractors in Memristive Systems.
6 Hidden Attractors in Fractional-Order Memristive Chaotic Systems -- 6.1 4D Example for Hidden Chaos -- 6.2 4D Example for Hidden Hyperchaos -- 7 Applications of Memristive Chaotic Systems -- 8 Multi-stability and Extreme Multi-stability of Memristive Chaotic Systems -- 8.1 Memristive Chaotic Systems with Self-excited Multi-stability -- 8.2 Memristive Chaotic Systems with Self-excited Extreme Multi-stability -- 8.3 Memristive Chaotic Systems with Hidden Multi-stability -- 8.4 Memristive Chaotic Systems with Hidden Extreme Multi-stability -- 8.5 Chaotic Systems with Mega-stability -- References -- Chaotic Jerk Systems with Hidden Attractors -- 1 Introduction -- 2 Simple Jerk Function that Generates Chaos -- 2.1 Simplest Jerk Function for Generating Chaos -- 2.2 Newtonian Jerky Dynamics -- 2.3 Jerk Function with Cubic Nonlinearities -- 2.4 Piecewise-Linear Jerk Functions -- 2.5 Jerky Dynamics Accompanied with Many Driving Functions -- 2.6 Multi-scroll Chaotic Jerk System -- 2.7 Other Examples -- 3 Systematic Method for Constructing a Simple 3D Jerk System -- 4 Chaotic Hyperjerk Systems -- 4.1 Example 1 -- 4.2 Example 2 -- 5 Coexisting Attractors in Jerk Systems -- 5.1 Example 1 -- 5.2 Example 2 -- 5.3 Example 3 -- 6 Chaotic Jerk Systems with Hidden Attractors -- 6.1 Example 1 -- 6.2 Example 2 -- 6.3 Example 3 -- References -- Part IV -- Multi-Stability in Symmetric Systems -- 1 Introduction -- 2 Broken Butterfly -- 3 Symmetric Bifurcations -- 4 Coexisting Symmetric and Symmetric Pairs of Attractors -- 5 Coexisting Chaos and Torus -- 6 Attractor Merging -- 7 Other Regimes of Coexisting Symmetric Attractors -- 8 Conclusions -- References -- Multi-Stability in Asymmetric Systems -- 1 Introduction -- 2 Coexisting Attractors in Rössler System -- 3 Introducing Additional Feedback for Breaking the Symmetry -- 4 Dimension Expansion for Breaking the Symmetry.
5 A Bridge Between Symmetry and Asymmetry -- 6 Conclusion -- References -- Multi-Stability in Conditional Symmetric Systems -- 1 Introduction -- 2 Conception of Conditional Symmetry -- 3 Constructing Conditional Symmetry from Single Offset Boosting -- 4 Constructing Conditional Symmetry from Multiple Offset Boosting -- 5 Constructing Conditional Symmetric System from Revised Polarity Balance -- 6 Discussions and Conclusions -- References -- Multi-Stability in Self-Reproducing Systems -- 1 Introduction -- 2 Concept of Self-Reproducing System -- 3 Self-Reproducing Chaotic Systems with 1D Infinitely Many Attractors -- 4 Self-Reproducing Chaotic Systems with 2D Lattices of Coexisting Attractors -- 5 Self-Reproducing Chaotic Systems with 3D Lattices of Coexisting Attractors -- 6 Discussions and Conclusions -- References -- Multi-Stability Detection in Chaotic Systems -- 1 Introduction -- 2 Multistability Identification by Amplitude Control -- 3 Multi-Stability Identification by Offset Boosting -- 4 Independent Amplitude Controller and Offset Booster -- 4.1 Constructing Independent Amplitude Controller -- 4.2 Finding Independent Offset Booster -- 5 Conclusions -- References -- Part V -- Complex Dynamics and Hidden Attractors in Delayed Impulsive Systems -- 1 Introduction -- 2 Preliminaries -- 3 FD-Reducible Time Delay Systems -- 4 A Time-Delay Impulsive System: Preliminary Results -- 5 Poincaré Map of a Time-Delay Impulsive System -- 6 Time-Delay

Impulsive Model of Testosterone Regulation -- 6.1 Bifurcation Analysis: Multi-Stability and Quasi-Periodicity -- 6.2 Bifurcation Analysis: Crater Bifurcation Scenario and Hidden Attractors -- 6.3 Bifurcation Analysis: Quasi-Periodic Period-Doubling -- 7 Conclusions -- References -- Unconventional Algorithms and Hidden Chaotic Attractors -- 1 Introduction.
2 Unconventional Algorithms-Motivation and Brief Introduction.