1. Record Nr. UNINA9910815733903321

Titolo	Advances in analysis and control of time-delayed dynamical systems / / edited by Jian-Qiao Sun, Univeristy of California-Merced, USA, Qian Ding, Tianjin University, China
Pubbl/distr/stampa	New Jersey : , : World Scientific, , [2013] 2013
ISBN	981-4525-50-2
Descrizione fisica	1 online resource (x, 342 pages) : illustrations (some color)
Collana	Gale eBooks
Disciplina	629.83
Soggetti	Dynamics Time delay systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Formerly CIP.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Preface; Contents; Chapter 1 Complete Quadratic Lyapunov-Krasovskii Functional: Limitations, Computational Efficiency, and Convergence Keqin Gu; 1. Introduction; 2. Complete Quadratic Lyapunov-Krasovskii Functional; 3. Discretized Lyapunov Functional Method; 4. Coupled Differential-difference Equations; 5. Miscellaneous Issues; 5.1. Computational Efficiency; 5.2. Convergence Issue for Multiple Neutral Delays; 5.3. Lyapunov-Krasovskii Functionals Containing State Derivatives; 6. SOS Method; 7. Conclusions and Perspectives; References Chapter 2 Recent Approaches for the Numerical Solution of State-dependent Delay Differential Equations with Discontinuities Alfredo Bellen1. Introduction; 2. Weak Solutions; 3. Regularization Techniques; 4. Comparing Regularizations; References; Chapter 3 Engineering Applications of Time-periodic Time-delayed Systems Gabor Stepan; 1. Introduction; 2. Delayed Mathieu Equation; 3. Semi-discretization Method for Periodic DDEs; 4. Engineering Applications; 4.1. Modeling and Stability of Milling Operations; 4.2. Cutting with Varying Spindle Speed 4.3. Act-and-wait Control of Force Controlled Robots5. Conclusions; References; Chapter 4 Synchronization in Delay-coupled Complex Networks Eckehard Scholl; 1. Introduction; 2. Stability of

Synchronization for Large Delay; 3. Cluster Synchronization; 4. Adaptive Synchronization; 4.1. Speed-gradient Method; 4.2. Zero-lag Synchronization; 4.3. Splay State and Cluster Synchronization; 4.4. Controlling Several Parameters Simultaneously; 5. Transitions between Synchronization and Desychronization; 5.1. Excitability of Type II; 5.2. Excitability of Type I; 6. Conclusion and Outlook; References
Chapter 5 Stochastic Dynamics and Optimal Control of Quasi Integrable Hamiltonian Systems with Time-delayed Feedback Control Weiqiu Zhu, Zhonghua Liu1. Introduction; 2. Stochastic Averaging Method for Quasi Integrable Hamiltonian Systems with Time-delayed Feedback Control; 2.1. Gaussian White Noise Excitations; 2.1.1. Non-resonant Case; 2.1.2. Resonant Case; 2.2. Wide-band Random Excitations; 2.2.1. Non-resonant Case; 2.2.2. Resonant Case; 2.3. Narrow-band Bounded Noise Excitation; 2.3.1. External Resonance Only; 2.3.2. Both Internal and External Resonances
2.4. Combined Excitations of Harmonic Function and One Kind of above Random Processes2.4.1. Internal Resonance Only; 2.4.2. External Resonance Only; 2.4.3. Both Internal and External Resonances; 3. Stochastic Dynamics of Quasi Integrable Hamiltonian Systems with Time-delayed Feedback Control; 3.1. Response; 3.2. Stochastic Stability; 3.3. Stochastic Bifurcation; 3.4. First Passage Failure; 3.4.1. Gaussian White Noise Excitation; 4. Stochastic Optimal Control of Quasi Integrable Hamiltonian Systems with Time-delayed Feedback Control; 4.1. Response Minimization Control; 4.2. Stabilization
4.3. Minimax Optimal Bounded Control

Sommario/riassunto

Analysis and control of time-delayed systems have been applied in a wide range of applications, ranging from mechanical, control, economic, to biological systems. Over the years, there has been a steady stream of interest in time-delayed dynamic systems, this book takes a snap shot of recent research from the world leading experts in analysis and control of dynamic systems with time delay to provide a bird's eye view of its development. The topics covered in this book include solution methods, stability analysis and control of periodic dynamic systems with time delay, bifurcations, stochastic