Advances and Applications in Nonlinear Control Systems /

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Monografía

The book reports on the latest advances and applications of nonlinear control systems. It consists of 30 contributed chapters by subject experts who are specialized in the various topics addressed in this book. The special chapters have been brought out in the broad areas of nonlinear control systems such as robotics, nonlinear circuits, power systems, memristors, underwater vehicles, chemical processes, observer design, output regulation, backstepping control, sliding mode control, time-delayed control, variables structure control, robust adaptive control, fuzzy logic control, chaos, hyperchaos, jerk systems, hyperjerk systems, chaos control, chaos synchronization, etc. Special importance was given to chapters offering practical solutions, modeling and novel control methods for the recent research problems in nonlinear control systems. This book will serve as a reference book for graduate students and researchers with a basic knowledge of electrical and control systems engineering. The resulting design procedures on the nonlinear control systems are emphasized using MATLAB software

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and Adaptive Control -- Adaptive Backstepping Control and Synchronization of Chlouverakis-Sprott Hyperjerk System -- Anti-Synchronization of Hyperchaotic Systems via Novel Sliding Mode Control Method and its Application to Vaidyanathan Hyperjerk Hyperchaotic System -- Sliding Mode Control with State Derivative Feedback in Novel Reciprocal State Space Form -- Active Controller Design for the Output Regulation of Vaidyanathan Hyperjerk System -- Analysis, Control and Synchronization of a Novel Highly Chaotic System with Three Quadratic Nonlinearities -- A No-Equilibrium Novel Highly Hyperchaotic System with Four Quadratic Nonlinearities and its Adaptive Control -- Identification, Stability and Stabilization of Limit Cycles in a Compass-Gait Biped Model via a Hybrid Poincaré Map -- Explicit Delay-Dependent Stability Criteria for Nonlinear Distributed Parameter Systems -- The Case of Bidirectionally Coupled Nonlinear Circuits via a Memristor -- Fuzzy Adaptive Sliding-Mode Control Scheme for Uncertain Underactuated Systems -- Unstable PLL-Controller as FM Modulator and Detection of Modulating Self-Oscillations -- Application of Time-Delayed Feedback Control Techniques in Digital Phase-Locked Loop -- Modeling and Predictive Control of Nonlinear Hybrid Systems using Mixed Logical -- Dynamical Formalism -- A Non-Linear Decentralized Control of Multimachine Power Systems based on a Backstepping Approach -- Diving Autopilot Design for Underwater Vehicles using an Adaptive Neuro-Fuzzy Sliding Mode Controller -- Variable Structure Sensorless Control of PMSM Drives -- Sliding Mode Control of Induction Generator Wind Turbine connected to the Grid -- Iterative Learning Control for Affine and Non Affine Linear Systems -- On Nonlinear Robust Adaptive Control: Application on Electro-Hydraulic Valve System -- Nonlinear Discrete Time Sliding Mode Control applied to a Pumping System -- Design of a Controller of Switched Nonlinear Systems based on Multiple Lyapunov Functions -- Nonlinear Sliding Mode Observer for Tire Pressure Monitoring -- Global Stabilization of Switched Nonlinear Systems using Backstepping Approach: Applications to Chemical Processes -- Second Order Sliding Mode Based Synchronization Control for Cooperative Robot Manipulators

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