

《非连续非线性系统的控制理论与应用》

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内容概要

Discontinuity in dynamic systems is a tough property for analysis and control of the system. However, in practical engineering, we are often faced with the discontinuity in control system design. In dynamical systems, the discontinuity is usually caused by natural phenomenon such as static friction, stroke changes etc., in mechanical systems or control actions engineered by controller design such as variable structure control, switching control, etc. For this kind of systems, the conventional framework for analysis and synthesis is not sufficient to provide a solution in exact theoretical sense. The field of control theory for dynamical systems with discontinuity is widely open for future research and development. The aim of the second China-Japan joint workshop on control theory and technology is to provide a forum for scientists on automatic control from both China and Japan to exchange contemporary research results and to promote the applications of advanced control theory to practical engineering problems, and as a result to enhance the development and spread of new results of control theory on the dynamical systems with discontinuities. The papers included in this book are selected from the workshop, and this selection is focused on the papers dealing with the closely related topics of nonsmooth, switching and hybrid systems and its applications in self-driven hybrid systems such as power systems, aircraft, land vehicles, mechanical and electrical systems. This book is organized as three parts: the first part contains 7 papers that addressed theoretical problems in design of nonlinear control systems with discontinuity and time-delay. The second part contains 6 papers with physical application of mechanical and electrical system, and the last part collects 4 papers that focus on the control problem in vehicular systems including railway, automotive engine, etc.

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书籍目录

Part I Design Method of Nonlinear Systems Design of Decentralized Robust Full-MRACS Based on Sliding Mode Control Yazdan Bavafa-Toosi and Hiromitsu Ohmori Stabilization of Switched Systems via both Controls and Switches Yahong Zhu and Daizhan Cheng Finite-Time Control and Input-to-State Stability Yiguang Hong and Zhongping Jiang Non-synchronized Output Feedback Controller Design of Discrete Time Piecewise Linear Systems Gang Feng and Tiejun Zhang Coordination Stability of Multi-Agent Systems with Switching Topology Yiguang Hong, Jiangping Hu and Lixin Gao Position Servo System Design for a Flight Simulation Table with Discontinuous Uncertainties Kai Zheng, Tielong Shen and Yu Yao Robust Exponential Stabilization for a Class of Nonlinear Singular Delay Systems Rcnquan Lu and Anke Xue Part Control of Mechanical and Electrical Systems Blended Lateral Jet and Aerodynamic Control Kemao Ma and Yu Yao Passivity-based Robust Control of Electrically-Driven Bilateral Teleoperation Systems Chiharu Ishii and Hiroshi Hashimoto Positioning Control of Hydraulic Actuator with Uncertain Input Nonlinearity Kazuhisa Ito and Tielong Shen Robust Coordinated Control for Tension-Looper of Hot Strip Mill Liping Shao, Xiaohong Jiao and Yah Peng Hybrid Control Strategy for Attitude Stabilization of an Under-actuated Spacecraft with Two Moving Mass Yu Jiang, Fenghua He and Yu Yao The Gap between Nonlinear Control Theories and Applications in Power Systems Yuanzhang Sun and Fang Yang Part Control of Vehicular Systems New Challenges in Powertrain Control — Advanced Engine Control System Development Environment Junichi Kako Air-Fuel Ratio Balancing Control with Single Sensor for Multi-Cylinder Internal Combustion Engines Kenji Suzuki, Tielong Shen and Yasuhiko Mutou A Marshalling Freight Cars in Freight Train Switchyard Using Reinforcement Learning Method Akira Inoue , Mingeong Deng , Takafumi Harada and Yoichi Hirashima Formation Adaptation for Maximum Area Coverage Tove Gustavi, Xiaoming Hu and Maja Karasalo

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