Adaptive Robust H Infinity Control For Nonlinear Systems

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Microgrids Amjad Anvari-Moghaddam 2021-05-21 Microgrids are a growing segment of the energy industry, representing a paradigm shift from centralized structures toward more localized, autonomous, dynamic, and bi-directional energy networks, especially in cities and communities. The ability to isolate from the larger grid makes microgrids resilient, while their capability of forming scalable energy clusters permits the delivery of services that make the grid more sustainable and competitive. Through an optimal design and management process, microgrids could also provide efficient, low-cost, clean energy and help to improve the operation and stability of regional energy systems. This book covers these promising and dynamic areas of research and development and gathers contributions on different aspects of microgrids in an aim to impart higher degrees of sustainability and resilience to energy systems.

Multi-model Jumping Systems: Robust Filtering and Fault Detection Shuping He 2021-03-01 This book focuses on multi-model systems, describing how to apply intelligent technologies to model complex multi-model systems by combining stochastic jumping system, neural network and fuzzy models. It focuses on robust filtering, including finite-time robust filtering, finite-frequency robust filtering and higher order moment robust filtering schemes, as well as fault detection problems for multi-model jump systems, such as observer-based robust fault detection, filtering-based robust fault detection and neural network-based robust fault detection methods. The book also demonstrates the validity and practicability of the theoretical results using simulation and practical examples, like circuit systems, robot systems and power systems. Further, it introduces readers to methods such as finite-time filtering, finite-frequency robust filtering, as well as higher order moment and neural network-based fault detection methods for multi-model jumping systems, allowing them to grasp the modeling, analysis and design of the multi-model systems presented and implement filtering and fault detection analysis for various systems, including circuit, network and mechanical systems.

Proceedings of the Inernational Conference on Control and Information 1995 Wong Wing Shing 1995-06-22

Fundamental Design and Automation Technologies in Offshore Robotics Hamid Reza Karimi 2020-10-06 Fundamental Design and Automation Technologies in Offshore Robotics introduces technological design, modelling, stability analysis, control synthesis, filtering problem and real time operation of robotics vehicles in offshore environments. The book gives numerical and simulation results in each chapter to reflect the engineering practice yet demonstrate the focus of the developed analysis and synthesis approaches. The book is ideal to be used as a reference book for senior and graduate students. It is written in a way that the presentation is simple, clear, and easy to read and understand which would be appreciated by graduate students. Researchers working on marine vehicles and robotics would be able to find reference material on related topics from the book. The book could be of a significant interest to the researchers within offshore and deep see society, including both academic and industrial parts. Provides a series of latest results in, including but not limited to, motion control, robotics, and multi-vehicle systems towards offshore environment Presents recent advances of theory, technological aspects, and applications of robotics in offshore environment Offers a comprehensive and up-to-date references, which plays an indicative role for further study of the reader

Identification of Physical Systems Rajamani Doraiswami 2014-07-29 Identification of a physical system deals with the problem of identifying its mathematical model using the measured input and output data. As the physical system is generally complex, nonlinear, and its input–output data is corrupted noise, there are fundamental theoretical and practical issues that need to be considered. Identification of Physical Systems addresses this need, presenting a systematic, unified approach to the problem of physical system identification and its practical applications. Starting with a least-squares method, the authors develop various schemes to address the issues of accuracy, variation in the operating regimes, closed loop, and interconnected subsystems. Also presented is a non-parametric signal or data-based scheme to identify a means to provide a quick macroscopic picture of the system to complement the precise microscopic picture given by the parametric model-based scheme. Finally, a sequential integration of totally different schemes, such as non-parametric, Kalman filter, and parametric model, is developed to meet the speed and accuracy requirement of mission-critical systems. Key features: Provides a clear understanding of theoretical and practical issues in identification and its applications, enabling the reader to grasp a clear understanding of the theory and apply it to practical problems Offers a self-contained guide by including the background necessary to understand this interdisciplinary subject Includes case studies for the application of identification on physical laboratory scale systems, as well as number of illustrative examples throughout the book Identification of Physical Systems is a comprehensive reference for researchers and practitioners working in this field and is also a useful source of information for graduate students in electrical, computer, biomedical, chemical, and mechanical engineering.

Robust and Adaptive Control Eugene Lavretsky 2012-11-13 Robust and Adaptive Control shows the reader how to produce consistent and accurate controllers that operate in the presence of uncertainties and unforeseen events. Driven by aerospace applications the focus of the book is primarily on continuous-dynamical systems. The text is a three-part treatment, beginning with robust and optimal linear control methods and moving on to a self-contained presentation of the design and analysis of model reference adaptive control (MRAC) for nonlinear uncertain dynamical systems. Recent extensions and modifications to MRAC design are included, as are guidelines for combining robust optimal and MRAC controllers. Features of the text include: · case studies that demonstrate the benefits of robust and adaptive control for piloted, autonomous and experimental aerial platforms; · detailed

background material for each chapter to motivate theoretical developments; · realistic examples and simulation data illustrating key features of the methods described; and · problem solutions for instructors and MATLAB® code provided electronically. The theoretical content and practical applications reported address real-life aerospace problems, being based on numerous transitions of control-theoretic results into operational systems and airborne vehicles that are drawn from the authors' extensive professional experience with The Boeing Company. The systems covered are challenging, often open-loop unstable, with uncertainties in their dynamics, and thus requiring both persistently reliable control and the ability to track commands either from a pilot or a guidance computer. Readers are assumed to have a basic understanding of root locus, Bode diagrams, and Nyquist plots, as well as linear algebra, ordinary differential equations, and the use of state-space methods in analysis and modeling of dynamical systems. Robust and Adaptive Control is intended to methodically teach senior undergraduate and graduate students how to construct stable and predictable control algorithms for realistic industrial applications. Practicing engineers and academic researchers will also find the book of great instructional value.

Artificial Intelligence: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2016-12-12 Ongoing advancements in modern technology have led to significant developments in artificial intelligence. With the numerous applications available, it becomes imperative to conduct research and make further progress in this field. Artificial Intelligence: Concepts, Methodologies, Tools, and Applications provides a comprehensive overview of the latest breakthroughs and recent progress in artificial intelligence. Highlighting relevant technologies, uses, and techniques across various industries and settings, this publication is a pivotal reference source for researchers, professionals, academics, upper-level students, and practitioners interested in emerging perspectives in the field of artificial intelligence.

Automatic Control, Mechatronics and Industrial Engineering Yigang He 2019-03-20 Engineering technology development and implementation play an important role in making the industry more sustainable in an increasingly competitive world. This book covers significant recent developments in both fundamental and applied research in the engineering field. Domains of application include, but are not limited to, Intelligent Control Systems and Optimization, Signal Processing, Sensors, Systems Modeling and Control, Robotics and Automation, Industrial and Electric Engineering, Production and Management. This book is an excellent reference work to get up to date with the latest research and developments in the fields of Automation, Mechatronics and Industrial Engineering. It aims to provide a platform for researchers and professionals in all relevant fields to gain new ideas and establish great achievements in scientific development.

Robust Control for Nonlinear Time-Delay Systems Changchun Hua 2017-06-28 This book reports on the latest findings concerning nonlinear control theory and applications. It presents novel work on several kinds of commonly encountered nonlinear time-delay systems, including those whose nonlinear terms satisfy high-order polynomial form or general nonlinear form, those with nonlinear input or a triangular structure, and so on. As such, the book will be of interest to university researchers, R&D engineers and graduate students in the fields of control theory and control engineering who wish to learn about the core principles, methods, algorithms, and applications of nonlinear time-delay systems.

Disturbance Observer-Based Control Shihua Li 2016-04-19 Due to its abilities to compensate disturbances and uncertainties, disturbance observer based control (DOBC) is regarded as one of the most promising approaches for disturbance-attenuation. One of the first books on DOBC, Disturbance Observer Based Control: Methods and Applications presents novel theory results as well as best practices for applica

Development of Adaptive Speed Observers for Induction Machine System Stabilization Ahmed A. Zaki Diab 2020-01-03 This book describes the development of an adaptive state observer using a mathematical model to achieve high performance for sensorless induction motor drives. This involves first deriving an expression for a modified gain rotor flux observer with a parameter adaptive scheme to estimate the motor speed accurately and improve the stability and performance of sensorless vector-controlled induction motor drives. This scheme is then applied to the controls of a photovoltaic-motor water-pumping system, which results in improved dynamic performance under different operating conditions. The book also presents a robust speed controller design for a sensorless vector-controlled induction motor drive system based on H∞ theory, which overcomes the problems of the classical controller.

Intelligent Sustainable Systems Jennifer S. Raj 2022-08-22 This book features research papers presented at the 5th International Conference on Intelligent Sustainable Systems (ICISS 2022), held at SCAD College of Engineering and Technology, Tirunelveli, Tamil Nadu, India, during February 17–18, 2022. The book discusses latest research works that discusses the tools, methodologies, practices, and applications of sustainable systems and computational intelligence methodologies. The book is beneficial for readers from both academia and industry.

Neural Information Processing Irwin King 2006-09-26 The three volume set LNCS 4232, LNCS 4233, and LNCS 4234 constitutes the refereed proceedings of the 13th International Conference on Neural Information Processing, ICONIP 2006, held in Hong Kong, China in October 2006. The 386 revised full papers presented were carefully reviewed and selected from 1175 submissions.

Analysis and Synthesis of Fuzzy Control Systems Gang Feng 2018-09-03 Fuzzy logic control (FLC) has proven to be a popular control methodology for many complex systems in industry, and is often used with great success as an alternative to conventional control techniques. However, because it is fundamentally model free, conventional FLC suffers from a lack of tools for systematic stability analysis and controller design. To address this problem, many model-based fuzzy control approaches have been developed, with the fuzzy dynamic model or the Takagi and Sugeno (T–S) fuzzy model-based approaches receiving the greatest attention. Analysis and Synthesis of Fuzzy Control Systems: A Model-Based Approach offers a unique reference devoted to the systematic analysis and synthesis of model-based fuzzy control systems. After giving a brief review of the varieties of FLC, including the T–S fuzzy model-based control, it fully explains the fundamental concepts of fuzzy sets, fuzzy logic, and fuzzy systems. This enables the book to be self-contained and provides a basis for later chapters, which cover: T–S fuzzy modeling and identification via nonlinear models or data Stability analysis of T–S fuzzy systems Stabilization controller synthesis as well as robust H∞ and observer and output feedback controller synthesis Robust controller synthesis of uncertain T–S fuzzy systems Time-delay T–S fuzzy systems Fuzzy model predictive control Robust fuzzy filtering Adaptive control of T–S fuzzy systems A reference for scientists and engineers in systems and control, the book also serves the needs of graduate students exploring fuzzy logic control. It readily demonstrates that conventional control technology and fuzzy logic control can be elegantly combined and further developed so that disadvantages of conventional FLC can be avoided and the horizon of conventional control technology greatly extended. Many chapters feature application simulation examples and practical numerical examples based on MATLAB®.

An H-Infinity Norm Minimization Approach for Adaptive Control Jonathan Adam Muse 2010 This dissertation seeks to merge the ideas from robust control theory such as H-Infinity control design and the Small Gain Theorem, L stability theory and Lyapunov stability from nonlinear control, and recent theoretical achievements in adaptive control. The fusion of frequency domain and linear time domain ideas allows the derivation of an H-Infinity Norm Minimization Approach (H-Infinity-NMA) for adaptive control architecture that permits a control designer to simplify the adaptive tuning process and tune the uncertainty compensation characteristics via linear control design techniques, band limit the adaptive control signal, efficiently handle redundant actuators, and handle unmatched uncertainty and matched uncertainty in a single design framework. The two stage design framework is similar to that used in robust control, but without sacrificing performance. The first stage of the design considers

an ideal system with the system uncertainty completely known. For this system, a control law is designed using linear H-Infinity theory. Then in the second stage, an adaptive process is implemented that emulates the behavior of the ideal system. If the linear H-Infinity design is applied to control the emulated system, it then guarantees closed loop system stability of the actual system. All of this is accomplished while providing notions of transient performance bounds between the ideal system and the true system.

Robust Control of Linear Systems and Nonlinear Control M. A. Kaashoek 2013-03-07 This volume is the second of the three volume publication containing the proceedings of the 1989 International Symposium on the Mathemat ical Theory of Networks and Systems (MTNS-89), which was held in Amsterdam, The Netherlands, June 19-23, 1989 The International Symposia MTNS focus attention on problems from system and control theory, circuit theory and signal processing, which, in general, require application of sophisticated mathematical tools, such as from function and operator theory, linear algebra and matrix theory, differential and algebraic geometry. The interaction between advanced mathematical methods and practical engineering problems of circuits, systems and control, which is typical for MTNS, turns out to be most effective and is, as these proceedings show, a continuing source of exciting advances. The second volume contains invited papers and a large selection of other symposium presentations in the vast area of robust and nonlinear control. Modern developments in robust control and H-infinity theory, for finite as well as for infinite dimensional systems, are presented. A large part of the volume is devoted to nonlinear control. Special atten tion is paid to problems in robotics. Also the general theory of nonlinear and infinite dimensional systems is discussed. A couple of papers deal with problems of stochastic control and filterina. vi Preface The titles of the two other volumes are: Realization and Modelling in System Theory (volume 1) and Signal Processing, Scattering and Operator Theory, and Numerical Methods (volume 3).

Fuzzy Systems and Knowledge Discovery Lipo Wang 2006-09-19 This book constitutes the refereed proceedings of the Third International Conference on Fuzzy Systems and Knowledge Discovery, FSKD 2006, held in federation with the Second International Conference on Natural Computation ICNC 2006. The book presents 115 revised full papers and 50 revised short papers. Coverage includes neural computation, quantum computation, evolutionary computation, DNA computation, fuzzy computation, granular computation, artificial life, innovative applications to knowledge discovery, finance, operations research, and more.

International Aerospace Abstracts 1998

Advances in System Dynamics and Control Azar, Ahmad Taher 2018-02-09 Complex systems are pervasive in many areas of science. With the increasing requirement for high levels of system performance, complex systems has become an important area of research due to its role in many industries. Advances in System Dynamics and Control provides emerging research on the applications in the field of control and analysis for complex systems, with a special emphasis on how to solve various control design and observer design problems, nonlinear systems, interconnected systems, and singular systems. Featuring coverage on a broad range of topics, such as adaptive control, artificial neural network, and synchronization, this book is an important resource for engineers, professionals, and researchers interested in applying new computational and mathematical tools for solving the complicated problems of mathematical modeling, simulation, and control.

RoadVehicles Surroundings Supervision On-Board Sensors and Communications Felipe Jimenez 2019-01-29 This book is a printed edition of the Special Issue "Road Vehicles Surroundings Supervision: On-Board Sensors and Communications" that was published in Applied Sciences

Robust H Infinity Adaptive Fuzzy Tracking Control for MIMO Nonlinear Stochastic Poisson Jump Diffusion Systems Xue Lin Lin 2016

Fuzzy System Identification and Adaptive Control Ruiyun Qi 2019-06-11 This book provides readers with a systematic and unified framework for identification and adaptive control of Takagi–Sugeno (T–S) fuzzy systems. Its design techniques help readers applying these powerful tools to solve challenging nonlinear control problems. The book embodies a systematic study of fuzzy system identification and control problems, using T–S fuzzy system tools for both function approximation and feedback control of nonlinear systems. Alongside this framework, the book also: introduces basic concepts of fuzzy sets, logic and inference system; discusses important properties of T–S fuzzy systems; develops offline and online identification algorithms for T–S fuzzy systems; investigates the various controller structures and corresponding design conditions for adaptive control of continuous-time T–S fuzzy systems; develops adaptive control algorithms for discrete-time input–output form T–S fuzzy systems with much relaxed design conditions, and discrete-time state-space T–S fuzzy systems; and designs stable parameter-adaptation algorithms for both linearly and nonlinearly parameterized T–S fuzzy systems. The authors address adaptive fault compensation problems for T–S fuzzy systems subject to actuator faults. They cover a broad spectrum of related technical topics and to develop a substantial set of adaptive nonlinear system control tools. Fuzzy System Identification and Adaptive Control helps engineers in the mechanical, electrical and aerospace fields, to solve complex control design problems. The book can be used as a reference for researchers and academics in nonlinear, intelligent, adaptive and fault-tolerant control.

Adaptive Dynamic Programming for Control Huaguang Zhang 2012-12-14 There are many methods of stable controller design for nonlinear systems. In seeking to go beyond the minimum requirement of stability, Adaptive Dynamic Programming in Discrete Time approaches the challenging topic of optimal control for nonlinear systems using the tools of adaptive dynamic programming (ADP). The range of systems treated is extensive; affine, switched, singularly perturbed and time-delay nonlinear systems are discussed as are the uses of neural networks and techniques of value and policy iteration. The text features three main aspects of ADP in which the methods proposed for stabilization and for tracking and games benefit from the incorporation of optimal control methods: • infinite-horizon control for which the difficulty of solving partial differential Hamilton–Jacobi–Bellman equations directly is overcome, and proof provided that the iterative value function updating sequence converges to the infimum of all the value functions obtained by admissible control law sequences; • finite-horizon control, implemented in discrete-time nonlinear systems showing the reader how to obtain suboptimal control solutions within a fixed number of control steps and with results more easily applied in real systems than those usually gained from infinite-horizon control; • nonlinear games for which a pair of mixed optimal policies are derived for solving games both when the saddle point does not exist, and, when it does, avoiding the existence conditions of the saddle point. Non-zero-sum games are studied in the context of a single network scheme in which policies are obtained guaranteeing system stability and minimizing the individual performance function yielding a Nash equilibrium. In order to make the coverage suitable for the student as well as for the expert reader, Adaptive Dynamic Programming in Discrete Time: • establishes the fundamental theory involved clearly with each chapter devoted to a clearly identifiable control paradigm; • demonstrates convergence proofs of the ADP algorithms to deepen understanding of the derivation of stability and convergence with the iterative computational methods used; and • shows how ADP methods can be put to use both in simulation and in real applications. This text will be of considerable interest to researchers interested in optimal control and its applications in operations research, applied mathematics computational intelligence and engineering. Graduate students working in control and operations research will also find the ideas presented here to be a source of powerful methods for furthering their study.

Handbook of Research on Advanced Intelligent Control Engineering and Automation Azar, Ahmad Taher 2014-11-30 In industrial engineering and manufacturing, control of individual processes and systems is crucial to developing a quality final product. Rapid developments in technology are pioneering new techniques of research in control and automation with multi-disciplinary applications in electrical, electronic, chemical, mechanical,

aerospace, and instrumentation engineering. The Handbook of Research on Advanced Intelligent Control Engineering and Automation presents the latest research into intelligent control technologies with the goal of advancing knowledge and applications in various domains. This text will serve as a reference book for scientists, engineers, and researchers, as it features many applications of new computational and mathematical tools for solving complicated problems of mathematical modeling, simulation, and control.

Intelligent Robotics and Applications Caihua Xiong 2008-10-14 These two volumes constitute the refereed proceedings of the First International Conference on Intelligent Robotics and Applications, ICIRA 2008, held in Wuhan, China, in October 2008. The 265 revised full papers presented were thoroughly reviewed and selected from 552 submissions; they are devoted but not limited to robot motion planning and manipulation; robot control; cognitive robotics; rehabilitation robotics; health care and artificial limb; robot learning; robot vision; human-machine interaction & coordination; mobile robotics; micro/nano mechanical systems; manufacturing automation; multi-axis surface machining; realworld applications.

Intelligent Networked Teleoperation Control Zhijun Li 2015-05-15 This book describes a unified framework for networked teleoperation systems involving multiple research fields: networked control systems for linear and nonlinear forms, bilateral teleoperation, trilateral teleoperation, multilateral teleoperation and cooperative teleoperation. It closely examines networked control as a field at the intersection of systems & control and robotics and presents a number of experimental case studies on testbeds for robotic systems, including networked haptic devices, robotic network systems and sensor network systems. The concepts and results outlined are easy to understand, even for readers fairly new to the subject. As such, the book offers a valuable reference work for researchers and engineers in the fields of systems & control and robotics.

Advances in Neural Networks - ISNN 2005 Jun Wang 2005-05-04 The three volume set LNCS 3496/3497/3498 constitutes the refereed proceedings of the Second International Symposium on Neural Networks, ISNN 2005, held in Chongqing, China in May/June 2005. The 483 revised papers presented were carefully reviewed and selected from 1.425 submissions. The papers are organized in topical sections on theoretical analysis, model design, learning methods, optimization methods, kernel methods, component analysis, pattern analysis, systems modeling, signal processing, image processing, financial analysis, control systems, robotic systems, telecommunication networks, incidence detection, fault diagnosis, power systems, biomedical applications, industrial applications, and other applications.

Scientific and Technical Aerospace Reports 1995

Unmanned Aerial Systems Anis Koubaa 2021-01-21 Unmanned Aerial Systems: Theoretical Foundation and Applications presents some of the latest innovative approaches to drones from the point-of-view of dynamic modeling, system analysis, optimization, control, communications, 3D-mapping, search and rescue, surveillance, farmland and construction monitoring, and more. With the emergence of low-cost UAS, a vast array of research works in academia and products in the industrial sectors have evolved. The book covers the safe operation of UAS, including, but not limited to, fundamental design, mission and path planning, control theory, computer vision, artificial intelligence, applications requirements, and more. This book provides a unique reference of the state-of-the-art research and development of unmanned aerial systems, making it an essential resource for researchers, instructors and practitioners. Covers some of the most innovative approaches to drones Provides the latest state-of-the-art research and development surrounding unmanned aerial systems Presents a comprehensive reference on unmanned aerial systems, with a focus on cutting-edge technologies and recent research trends in the area

Adaptive Robust Control Systems Anh Tuan Le 2018-03-07 This book focuses on the applications of robust and adaptive control approaches to practical systems. The proposed control systems hold two important features: (1) The system is robust with the variation in plant parameters and disturbances (2) The system adapts to parametric uncertainties even in the unknown plant structure by self-training and self-estimating the unknown factors. The various kinds of robust adaptive controls represented in this book are composed of sliding mode control, model-reference adaptive control, gain-scheduling, H-infinity, model-predictive control, fuzzy logic, neural networks, machine learning, and so on. The control objects are very abundant, from cranes, aircrafts, and wind turbines to automobile, medical and sport machines, combustion engines, and electrical machines.

Active Vibration & Noise Control: Design Towards Performance Limit Jiqiang Wang 2022-09-23 The book is motivated by the pivotal issue: what is the performance limit of active control and energy harvesting? It aims to develop systematic design methodologies with a “visualization technique” where the performance limit can be readily determined solely based on visual inspections. Modern technological systems have evolved toward high speed, heavy load, lightweight, flexible operation and extreme conditions, as demonstrated in aerospace, marine, transportation and manufacturing industries. The associated vibration and noise issues have become such problematic that they may significantly confine the performance of the systems, to say the discomfort at least. Through the geometric representation of the performance specifications, fundamental issues such as (1) the existence of feasible controllers; (2) the optimality of controllers; (3) the performance limit of controllers; (4) compromisability among the performance specifications; (5) the synthesis of controllers; and (6) the influence of constraints on optimal solutions can all be resolved within the proposed framework. The state of the art is thus refined with a new approach complementary to those optimization-based routines, where extra effort would have to be exercised to disclose the compromisability of performance specifications. The proposed book will result in a new design methodology—performance limit-oriented active control. It was initiated by the author with the project “Active Control for Performance Limit” (ACPL). A series of fundamental results are obtained and will be disseminated in this book. The results are verified through extensive numerical demonstrations and are expected to provide useful guidance for practical engineering in the vibration and noise industry and research.

Applied Digital Control J. R. Leigh 2006-06-23 An essential core text, this volume develops theoretical foundations and explains how control systems work in real industrial situations. Several case histories assist students in visualizing applications. 1992 edition.

Intelligent Control Kaushik Das Sharma 2018-08-28 This book discusses systematic designs of stable adaptive fuzzy logic controllers employing hybridizations of Lyapunov strategy-based approaches/H∞ theory-based approaches and contemporary stochastic optimization techniques. The text demonstrates how candidate stochastic optimization techniques like Particle swarm optimization (PSO), harmony search (HS) algorithms, covariance matrix adaptation (CMA) etc. can be utilized in conjunction with the Lyapunov theory/H∞ theory to develop such hybrid control strategies. The goal of developing a series of such hybridization processes is to combine the strengths of both Lyapunov theory/H∞ theory-based local search methods and stochastic optimization-based global search methods, so as to attain superior control algorithms that can simultaneously achieve desired asymptotic performance and provide improved transient responses. The book also demonstrates how these intelligent adaptive control algorithms can be effectively utilized in real-life applications such as in temperature control for air heater systems with transportation delay, vision-based navigation of mobile robots, intelligent control of robot manipulators etc.

Robust Adaptive Nonlinear H [infinity] Tracking Control for Euler-Lagrange Systems Itzhak Levi 2009

Issues in Electronic Circuits, Devices, and Materials: 2011 Edition 2012-01-09 Issues in Electronic Circuits, Devices, and Materials: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Electronic Circuits, Devices, and Materials. The editors have built Issues in Electronic Circuits, Devices, and Materials: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Electronic Circuits, Devices, and Materials in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in

Electronic Circuits, Devices, and Materials: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at http://www.ScholarlyEditions.com/.

Robust Adaptive Control Petros Ioannou 2013-09-26 Presented in a tutorial style, this comprehensive treatment unifies, simplifies, and explains most of the techniques for designing and analyzing adaptive control systems. Numerous examples clarify procedures and methods. 1995 edition.

Non-Monotonic Approach to Robust H-Infinity Control of Multi-Model Systems Jiwei Wen 2019-06-21 Non-monotonic Approach to Robust H∞ Control of Multi-model Systems focuses on robust analysis and synthesis problems for multi-model systems based on the non-monotonic Lyapunov Functionals (LFs) approach that enlarges the stability region and improves control performance. By fully considering the diversity of switching laws, the multi-step time difference, the multi-step prediction, and the expansion of system dimension, the non-monotonic LF can be properly constructed. The focus of this book is placed on the H∞ state feedback control, H∞ filtering and H∞ output feedback control for multi-model systems via a non-monotonic LF approach. The book's authors provide illustrative examples to show the feasibility and efficiency of the proposed methods, along with practical examples that demonstrate the effectiveness and potential of theoretical results. Offers tools for the analysis and design of control processes where the process can be represented by multi-models Presents a comprehensive explanation of recent developments in non-monotonic approaches to robust H-infinity control of multi-model systems Gives numerical examples and simulation results in each chapter to demonstrate engineering potential

Adaptive Backstepping Control of Uncertain Systems Jing Zhou 2008-02-07 This book employs the powerful and popular adaptive backstepping control technology to design controllers for dynamic uncertain systems with non-smooth nonlinearities. Various cases including systems with time-varying parameters, multi-inputs and multi-outputs, backlash, dead-zone, hysteresis and saturation are considered in design and analysis. For multi-inputs and multi-outputs systems, both centralized and decentralized controls are addressed. This book not only presents recent research results including theoretical success and practical development such as the proof of system stability and the improvement of system tracking and transient performance, but also gives self-contained coverage of fundamentals on the backstepping approach illustrated with simple examples. Detail description of methodologies for the construction of adaptive laws, feedback control laws and associated Lyapunov functions is systematically provided in each case. Approaches used for the analysis of system stability and tracking and transient performances are elaborated. Two case studies are presented to show how the presented theories are applied.

Jitendra R. Raol 2019-07-12 Control Systems: Classical, Modern, and AI-Based Approaches provides a broad and comprehensive study of the principles, mathematics, and applications for those studying basic control in mechanical, electrical, aerospace, and other engineering disciplines. The text builds a strong mathematical foundation of control theory of linear, nonlinear, optimal, model predictive, robust, digital, and adaptive control systems, and it addresses applications in several emerging areas, such as aircraft, electro-mechanical, and some nonengineering systems: DC motor control, steel beam thickness control, drum boiler, motional control system, chemical reactor, head-disk assembly, pitch control of an aircraft, yaw-damper control, helicopter control, and tidal power control. Decentralized control, game-theoretic control, and control of hybrid systems are discussed. Also, control systems based on artificial neural networks, fuzzy logic, and genetic algorithms, termed as AI-based systems are studied and analyzed with applications such as auto-landing aircraft, industrial process control, active suspension system, fuzzy gain scheduling, PID control, and adaptive neuro control. Numerical coverage with MATLAB® is integrated, and numerous examples and exercises are included for each chapter. Associated MATLAB® code will be made available.

Nonlinear Control Systems Design, 1998 H. J. C. Huijberts 1998 The NOLCOS '98 is the fourth edition of the IFAC Nonlinear Control Systems Design Symposium, which is organised every three years. The symposium presented the state of the art in the design of nonlinear control systems. It explored current theoretical developments as well as their latest applications to engineering problems. The symposium provided a forum for the presentation and discussion of papers which described new design methodologies for the control of nonlinear plants and featured novel applications of these methods. The symposium included six plenary lectures and 30 sessions, including five invited sessions. The range of topics under discussion included amongst others: Applications of nonlinear control; Algebraic theory of nonlinear systems; Geometric theory of nonlinear systems; Discrete-time nonlinear control systems; Stabilizability and feedback stabilization; Nonlinear observers and filters; Optimal control of nonlinear systems; Variable structure systems; Nonlinear robust and H-Infinity control; Adaptive control of nonlinear systems; Singular perturbations in nonlinear control; Expert control for nonlinear systems; Computational methods for design and control.

Control Systems