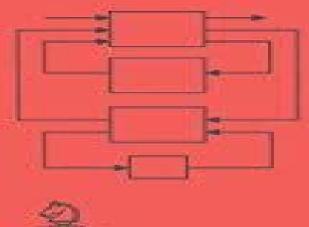
# Lecture Notes in Control and Information Sciences 227

Sophie Tarbouriech and Germain Garcia (Eds)

## Control of Uncertain Systems with Bounded Inputs





Springer

## **Control Of Uncertain Systems With Bounded Inputs**

Alan S. I. Zinober

### **Control Of Uncertain Systems With Bounded Inputs:**

Control of Uncertain Systems with Bounded Inputs Sophie Tarbouriech, Germain Garcia, 2014-03-12 In practical control problems many constraints have to be handled in order to design controllers which operate in a real environment By combining results on robust control and saturating control this book attempts to provide positive help for practical situations and as one of the first books to merge the two control fields it should generate considerable interest in scientific acad emic circles The ten chapters which deal with stabilization and control of both linear and nonlinear systems are each independent in their approach some deal purely with theoretical results whilst others concentrate on ways in which the theory can be applied The book s unity is secured by the desire to formulate control design requirements through constraints on input and model uncertainty description Control of Uncertain Systems with Bounded Inputs Sophie Tarbouriech, 1997-07-04 In practical control problems many constraints have to be handled in order to design controllers which operate in a real environment By combining results on robust control and saturating control this book attempts to provide positive help for practical situations and as one of the first books to merge the two control fields it should generate considerable interest in scientific acad emic circles The ten chapters which deal with stabilization and control of both linear and nonlinear systems are each independent in their approach some deal purely with theoretical results whilst others concentrate on ways in which the theory can be applied The book s unity is secured by the desire to formulate control design requirements through constraints on input and model uncertainty description **Deterministic Control of Uncertain Systems** Alan S. I. Zinober, 1990 Includes sections on Sliding mode control with switching command devices Hyperplane design and CAD of variable structure control systems Variable structure controllers for robots The hyperstability approach to VSCS design Nonlinear continuous feedback for robust tracking Control of uncertain systems with neglected dynamics Control of infinite dimensional plants Adaptive Control of Dynamic Systems with Uncertainty and Quantization Jing Zhou, Lantao Xing, Changvun Wen, 2021-12-14 This book presents a series of innovative technologies and research results on adaptive control of dynamic systems with quantization uncertainty and nonlinearity including the theoretical success and practical development such as the approaches for stability analysis the compensation of quantization the treatment of subsystem interactions and the improvement of system tracking and transient performance Novel solutions by adopting backstepping design tools to a number of hotspots and challenging problems in the area of adaptive control are provided In the first three chapters the general design procedures and stability analysis of backstepping controllers and the basic descriptions and properties of quantizers are introduced as preliminary knowledge for this book In the remainder of this book adaptive control schemes are introduced to compensate for the effects of input quantization state quantization both input and state output quantization for uncertain nonlinear systems and are applied to helicopter systems and DC Microgrid Discussion remarks are provided in each chapter highlighting new approaches and contributions to emphasize the novelty of the presented design

and analysis methods Simulation results are also given in each chapter to show the effectiveness of these methods This book is helpful to learn and understand the fundamental backstepping schemes for state feedback control and output feedback control It can be used as a reference book or a textbook on adaptive quantized control for students with some background in feedback control systems Researchers graduate students and engineers in the fields of control information and communication electrical engineering mechanical engineering computer science and others will benefit from this book

Control of Uncertain Systems Martin John Corless,1984 Actuator Saturation Control Vikram Kapila, Karolos Grigoriadis, 2002-02-20 Compiling the most significant advances from nearly a decade of research this reference compares and evaluates a wide variety of techniques for the design analysis and implementation of control methodologies for systems with actuator saturation The book presents efficient computational algorithms and new control paradigms for application in the Nonlinear and Adaptive Control Alessandro Astolfi, 2006 This book summarizes the main results achieved in a four year European Project on nonlinear and adaptive control The project involves leading researchers from top notch institutions Imperial College London Prof A Astolfi Lund University Prof A Rantzer Supelec Paris Prof R Ortega University of Technology of Compiegne Prof R Lozano Grenoble Polytechnic Prof C Canudas de Wit University of Twente Prof A van der Schaft Politecnico of Milan Prof S Bittanti and Polytechnic University of Valencia Prof P Albertos The book also provides an introduction to theoretical advances in nonlinear and adaptive control and an overview of novel applications of advanced control theory particularly topics on the control of partially known systems under actuated systems and bioreactors

Stability and Stabilization of Linear Systems with Saturating Actuators Sophie Tarbouriech, Germain Garcia, João Manoel Gomes da Silva Jr., Isabelle Queinnec, 2011-08-13 This monograph details basic concepts and tools fundamental for the analysis and synthesis of linear systems subject to actuator saturation and developments in recent research The authors use a state space approach and focus on stability analysis and the synthesis of stabilizing control laws in both local and global contexts Different methods of modeling the saturation and behavior of the nonlinear closed loop system are given special attention Various kinds of Lyapunov functions are considered to present different stability conditions Results arising from uncertain systems and treating performance in the presence of saturation are given The text proposes methods and algorithms based on the use of linear programming and linear matrix inequalities for computing estimates of the basin of attraction and for designing control systems accounting for the control bounds and the possibility of saturation They can be easily implemented with mathematical software packages

Proceedings of the ... American Control Conference ,2005

Journal of Dynamic Systems, Measurement, and Control ,1997 Publishes theoretical and applied original papers in dynamic systems Theoretical papers present new theoretical developments and knowledge for controls of dynamical systems together with clear engineering motivation for the new theory Applied papers include modeling simulation and corroboration of theory with emphasis on demonstrated practicality 

Control Science and Technology for the Progress of Science

International Federation of Automatic Control. World Congress, 1981 Mathematical Reviews ,2000 **Proceedings of** the 2015 Chinese Intelligent Systems Conference Yingmin Jia, Junping Du, Hongbo Li, Weicun Zhang, 2015-12-11 This book presents selected research papers from the 2015 Chinese Intelligent Systems Conference CISC 15 held in Yangzhou China The topics covered include multi agent systems evolutionary computation artificial intelligence complex systems computation intelligence and soft computing intelligent control advanced control technology robotics and applications intelligent information processing iterative learning control and machine learning Engineers and researchers from academia industry and the government can gain valuable insights into solutions combining ideas from multiple disciplines in the field of **Proceedings of the 1988 American Control Conference**, 1988 intelligent systems System Modelling and Optimization Hans-Jürgen Sebastian, K. Tammer, 1990 The aim of the present proceedings volume is to discuss recent advances in the mathematical representation of engineering socio technical and socio economical systems as well as in the optimization of their performance The papers presented are extended versions of about 100 lectures plenary lectures as well as lectures of the parallel sessions of the conference All papers include original researching results of the authors Some have the character of a survey **IEEE Transactions on Circuits and Systems** ,2006 Proceedings ,1980 Control of Partially-Known Dynamical Systems Ahmad A. Bahnasawi, Magdi S. Mahmoud, 1989-06-16 The main objective of this monograph is to develop efficient techniques for tackling the control problems of partially known dynamical systems This broad class of systems has a fundamental feature Knowledge of the dynamic characteristics of the control plant is not complete In one category the missing knowledge is due to the unmodeled high frequency parasitics adaptive systems In another category some of the model parameters are unknown but bounded uncertain systems. The book concentrates on reduced order adaptive control schemes and deterministic stabilizing control methodologies Special emphasis has been placed on presenting new results establishing efficient control laws and treating both small scale and large scale problems Effects of external disturbances state parameter errors and interconnection patterns have been investigated and dealt with in contructing various controller structures Probabilistic Mechanics & Structural Reliability Dan M. Frangopol, Mircea Grigoriu,1996 Contains three keynote papers and some 230 contributed four page papers from the August 1996 conference examining all aspects of probabalistic mechanics and structural reliability regarding assessment and design of structural mechanical marine aerospace geotechnical and environmental systems Emphasis is on concepts and methods of probability in the design of engineering systems with particular focus on progress in stochastic mechanics in earthquake engineering structural dynamics and finite element methods Annotation copyright by Book News Inc Portland OR **Dynamics of** Continuous, Discrete & Impulsive Systems ,2001

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