

Feedback Control Of Dynamic Systems 6th Edition Ebook

This text deals with matrix methods for handling, reducing, and analyzing data from a dynamic system, and covers techniques for the design of feedback controllers for those systems which can be perfectly modeled. Unlike other texts at this level, this book also provides techniques for the design of feedback controllers for those systems which cannot be perfectly modeled. In addition, presentation draws attention to the iterative nature of the control design process, and introduces model reduction and concepts of equivalent models, topics not generally covered at this level. Chapters cover mathematical preliminaries, models of dynamic systems, properties of state space realizations, controllability and observability, equivalent realizations and model reduction, stability, optimal control of time-variant systems, state estimation, and model error concepts and compensation. Extensive appendixes cover the requisite mathematics.

This textbook is ideal for a course in engineering systems dynamics and controls. The work is a comprehensive treatment of the analysis of lumped parameter physical systems. Starting with a discussion of mathematical models in general, and ordinary differential equations, the book covers input/output and state space models, computer simulation and modeling methods and techniques in mechanical, electrical, thermal and fluid domains. Frequency domain methods, transfer functions and frequency response are covered in detail. The book concludes with a treatment of stability, feedback control (PID, lead-lag, root locus) and an introduction to discrete time systems. This new edition features many new and expanded sections on such topics as: solving stiff systems, operational amplifiers, electrohydraulic servovalves, using Matlab with transfer functions, using Matlab with frequency response, Matlab tutorial and an expanded Simulink tutorial. The work has 40% more end-of-chapter exercises and 30% more examples.

Dynamics systems (living organisms, electromechanical and industrial systems, chemical and technological processes, market and ecology, and so forth) can be considered and analyzed using information and systems theories. For example, adaptive human behavior can be studied using automatic feedback control. As an illustrative example, the driver controls a car changing the speed and steering wheels using incoming information, such as traffic and road conditions. This book focuses on the most important and manageable topics in applied multivariable control with application to a wide class of electromechanical dynamic systems. A large spectrum of systems, familiar to electrical, mechanical, and aerospace students, engineers, and scholars, are thoroughly studied to build the bridge between theory and practice as well as to illustrate the practical application of control theory through illustrative examples. It is the author's goal to write a book that can be used to teach undergraduate and graduate classes in automatic control and nonlinear control at electrical, mechanical, and aerospace engineering departments. The book is also addressed to engineers and scholars, and the examples considered allow one to implement the theory in a great variety of industrial systems. The main purpose of this book is to help the reader grasp the nature and significance of multivariable control.

Active Disturbance Rejection Control of Dynamic Systems: A Flatness Based Approach describes the linear control of uncertain nonlinear systems. The net result is a practical controller design that is simple and surprisingly robust, one that also guarantees convergence to small neighborhoods of desired equilibria or tracking errors that are as close to zero as desired. This methodology differs from current robust feedback controllers characterized by either complex matrix manipulations, complex parameter adaptation schemes and, in other cases, induced high frequency noises through the classical chattering phenomenon. The approach contains many of the cornerstones, or philosophical features, of Model Free Control and ADRC, while exploiting flatness and GPI control in an efficient manner for linear, nonlinear, mono-variable and multivariable systems, including those exhibiting inputs delays. The book contains successful experimental laboratory case studies of diverse engineering problems, especially those relating to mechanical, electro-mechanical, robotics, mobile robotics and power electronics systems. Provides an alternative way to solve disturbance rejection problems and robust control problem beyond the existing approaches based on matrix algebra and state observers Generalizes the widely studied Extended State Observer to a class of observers called Generalized Proportional Integral Observers (GPI Observers) Contains successful experimental laboratory case studies

Introduction to state-space methods covers feedback control; state-space representation of dynamic systems and dynamics of linear systems; frequency-domain analysis; controllability and observability; shaping the dynamic response; more. 1986 edition.

Stability theory has allowed us to study both qualitative and quantitative properties of dynamical systems, and control theory has played a key role in designing numerous systems. Contemporary sensing and communication networks enable collection and subscription of geographically-distributed information and such information can be used to enhance significantly the performance of many of existing systems.

Through a shared sensing/communication network, heterogeneous systems can now be controlled to cooperate robustly and autonomously; cooperative control is to make the systems act as one group and exhibit certain cooperative behavior, and it must be pliable to physical and environmental constraints as well as be robust to intermittency, latency and changing patterns of the information flow in the network. This book attempts to provide a detailed coverage on the tools of and the results on analyzing and synthesizing cooperative systems. Dynamical systems under consideration can be either continuous-time or discrete-time, either linear or non-linear, and either unconstrained or constrained. Technical contents of the book are divided into three parts. The first part consists of Chapters 1, 2, and 4. Chapter 1 provides an overview of cooperative behaviors, kinematical and dynamical modeling approaches, and typical vehicle models. Chapter 2 contains a review of standard analysis and design tools in both linear control theory and non-linear control theory. Chapter 4 is a focused treatment of non-negative matrices and their properties, multiplicative sequence convergence of non-negative and row-stochastic matrices, and the presence of these matrices and sequences in linear cooperative systems.

Like engineering systems, biological systems must also operate effectively in the presence of internal and external uncertainty—such as genetic mutations or temperature changes, for example. It is not surprising, then, that evolution has resulted in the widespread use of feedback, and research in systems biology over the past decade has shown that feedback control systems are widely found in biology. As an increasing number of researchers in the life sciences become interested in control-theoretic ideas such as feedback, stability, noise and disturbance attenuation, and robustness, there is a need for a text that explains feedback control as it applies to biological systems. Written by established researchers in both control engineering and systems biology, *Feedback Control in Systems Biology* explains how feedback control concepts can be applied to systems biology. Filling the need for a text on control theory for systems biologists, it provides an overview of relevant ideas and methods from control engineering and illustrates their application to the analysis of biological systems with case studies in cellular and molecular biology. *Control Theory for Systems Biologists* The book focuses on the fundamental concepts used to analyze the effects of feedback in biological control systems, rather than the control system design methods that form the core of most control textbooks. In addition, the authors do not assume that readers are familiar with control theory. They focus on "control applications" such as metabolic and gene-regulatory networks rather than aircraft, robots, or engines, and on mathematical models derived from classical reaction kinetics rather than classical mechanics. Another significant feature of the book is that it discusses nonlinear systems, an understanding of which is crucial for systems biologists because of the highly nonlinear nature of biological systems. The authors cover tools and techniques for the analysis of linear and nonlinear systems; negative and positive feedback; robustness analysis methods; techniques for the reverse-engineering of biological interaction networks; and the analysis of stochastic biological control systems. They also identify new research directions for control theory inspired by the

dynamic characteristics of biological systems. A valuable reference for researchers, this text offers a sound starting point for scientists entering this fascinating and rapidly developing field.

An integrated presentation of both classical and modern methods of systems modeling, response and control. Includes coverage of digital control systems. Details sample data systems and digital control.

Provides numerical methods for the solution of differential equations. Gives in-depth information on the modeling of physical systems and central hardware.

Bipedal locomotion is among the most difficult challenges in control engineering. Most books treat the subject from a quasi-static perspective, overlooking the hybrid nature of bipedal mechanics. Feedback Control of Dynamic Bipedal Robot Locomotion is the first book to present a comprehensive and mathematically sound treatment of feedback design for achieving stable, agile, and efficient locomotion in bipedal robots. In this unique and groundbreaking treatise, expert authors lead you systematically through every step of the process, including: Mathematical modeling of walking and running gaits in planar robots Analysis of periodic orbits in hybrid systems Design and analysis of feedback systems for achieving stable periodic motions Algorithms for synthesizing feedback controllers Detailed simulation examples Experimental implementations on two bipedal test beds The elegance of the authors' approach is evident in the marriage of control theory and mechanics, uniting control-based presentation and mathematical custom with a mechanics-based approach to the problem and computational rendering. Concrete examples and numerous illustrations complement and clarify the mathematical discussion. A supporting Web site offers links to videos of several experiments along with MATLAB® code for several of the models. This one-of-a-kind book builds a solid understanding of the theoretical and practical aspects of truly dynamic locomotion in planar bipedal robots.

This work is aimed at mathematics and engineering graduate students and researchers in the areas of optimization, dynamical systems, control systems, signal processing, and linear algebra. The motivation for the results developed here arises from advanced engineering applications and the emergence of highly parallel computing machines for tackling such applications. The problems solved are those of linear algebra and linear systems theory, and include such topics as diagonalizing a symmetric matrix, singular value decomposition, balanced realizations, linear programming, sensitivity minimization, and eigenvalue assignment by feedback control. The tools are those, not only of linear algebra and systems theory, but also of differential geometry. The problems are solved via dynamical systems implementation, either in continuous time or discrete time, which is ideally suited to distributed parallel processing. The problems tackled are indirectly or directly concerned with dynamical systems themselves, so there is feedback in that dynamical systems are used to understand and optimize dynamical systems. One key to the new research results has been the recent discovery of rather deep existence and uniqueness results for the solution of certain matrix least squares optimization problems in geometric invariant theory. These problems, as well as many other optimization problems arising in linear algebra and systems theory, do not always admit solutions which can be found by algebraic methods.

The essential introduction to the principles and applications of feedback systems—now fully revised and expanded This textbook covers the mathematics needed to model, analyze, and design feedback systems. Now more user-friendly than ever, this revised and expanded edition of Feedback Systems is a one-volume resource for students and researchers in mathematics and engineering. It has applications across a range of disciplines that utilize feedback in physical, biological, information, and economic systems. Karl Åström and Richard Murray use techniques from physics, computer science, and operations research to introduce control-oriented modeling. They begin with state space tools for analysis and design, including stability of solutions, Lyapunov functions, reachability, state feedback observability, and estimators. The matrix exponential plays a central role in the analysis of linear control systems, allowing a concise development of many of the key concepts for this class of models. Åström and Murray then develop and explain tools in the frequency domain, including transfer functions, Nyquist analysis, PID control, frequency domain design, and robustness. Features a new chapter on design principles and tools, illustrating the types of problems that can be solved using feedback Includes a new chapter on fundamental limits and new material on the Routh-Hurwitz criterion and root locus plots Provides exercises at the end of every chapter Comes with an electronic solutions manual An ideal textbook for undergraduate and graduate students Indispensable for researchers seeking a self-contained resource on control theory

The simulation of complex, integrated engineering systems is a core tool in industry which has been greatly enhanced by the MATLAB® and Simulink® software programs. The second edition of Dynamic Systems: Modeling, Simulation, and Control teaches engineering students how to leverage powerful simulation environments to analyze complex systems. Designed for introductory courses in dynamic systems and control, this textbook emphasizes practical applications through numerous case studies—derived from top-level engineering from the AMSE Journal of Dynamic Systems. Comprehensive yet concise chapters introduce fundamental concepts while demonstrating physical engineering applications. Aligning with current industry practice, the text covers essential topics such as analysis, design, and control of physical engineering systems, often composed of interacting mechanical, electrical, and fluid subsystem components. Major topics include mathematical modeling, system-response analysis, and feedback control systems. A wide variety of end-of-chapter problems—including conceptual problems, MATLAB® problems, and Engineering Application problems—help students understand and perform numerical simulations for integrated systems.

For courses in electrical & computing engineering. Feedback control fundamentals with context, case studies, and a focus on design Feedback Control of Dynamic Systems, 8th Edition, covers the material that every engineer needs to know about feedback control—including concepts like stability, tracking, and robustness. Each chapter presents the fundamentals along with comprehensive, worked-out examples, all within a real-world context and with historical background provided. The text is devoted to supporting students equally in their need to grasp both traditional and more modern topics of digital control, and the author's focus on design as a theme early on, rather than focusing on analysis first and incorporating design much later. An entire chapter is devoted to comprehensive case studies, and the 8th Edition has been revised with up-to-date information, along with brand-new sections, problems, and examples.

This book is devoted to new methods of control for complex dynamical systems and deals with nonlinear control systems having several degrees of freedom, subjected to unknown disturbances, and containing uncertain parameters. Various constraints are imposed on control inputs and state variables or their combinations. The book contains an introduction to the theory of optimal control and the theory of stability of motion, and also a description of some known methods based on these theories. Major attention is given to new methods of control developed by the authors over the last 15 years. Mechanical and electromechanical systems described by nonlinear Lagrange's equations are considered. General methods are proposed for an effective construction of the required control, often in an explicit form. The book contains various techniques including the decomposition of nonlinear control systems with many degrees of freedom, piecewise linear feedback control based on Lyapunov's functions, methods which elaborate and extend the approaches of the conventional control theory, optimal control, differential games, and the theory of stability. The distinctive feature of the methods developed in the book is that the controls obtained satisfy the imposed constraints and steer the dynamical system to a prescribed terminal state in finite time. Explicit upper estimates for the time of the process are given. In all cases, the control algorithms and the estimates obtained are strictly proven.

For courses in electrical & computing engineering. Feedback control fundamentals with context, case studies, and a focus on design Feedback Control of Dynamic Systems, 8th Edition, covers the material that every engineer needs to know about feedback control—including concepts like stability, tracking, and robustness. Each chapter presents the fundamentals along with

comprehensive, worked-out examples, all within a real-world context and with historical background provided. The text is devoted to supporting students equally in their need to grasp both traditional and more modern topics of.

This work discusses the use of digital computers in the real-time control of dynamic systems using both classical and modern control methods. Two new chapters offer a review of feedback control systems and an overview of digital control systems. MATLAB statements and problems have been more thoroughly and carefully integrated throughout the text to offer students a more complete design picture.

Feedback Control of Dynamic Systems Prentice Hall

Written to inspire and cultivate the ability to design and analyze feasible control algorithms for a wide range of engineering applications, this comprehensive text covers the theoretical and practical principles involved in the design and analysis of control systems. From the development of the mathematical models for dynamic systems, the author shows how they are used to obtain system response and facilitate control, then addresses advanced topics, such as digital control systems, adaptive and robust control, and nonlinear control systems.

An excellent introduction to feedback control system design, this book offers a theoretical approach that captures the essential issues and can be applied to a wide range of practical problems. Its explorations of recent developments in the field emphasize the relationship of new procedures to classical control theory, with a focus on single input and output systems that keeps concepts accessible to students with limited backgrounds. The text is geared toward a single-semester senior course or a graduate-level class for students of electrical engineering. The opening chapters constitute a basic treatment of feedback design. Topics include a detailed formulation of the control design program, the fundamental issue of performance/stability robustness tradeoff, and the graphical design technique of loopshaping. Subsequent chapters extend the discussion of the loopshaping technique and connect it with notions of optimality. Concluding chapters examine controller design via optimization, offering a mathematical approach that is useful for multivariable systems.

This book is a collection of 34 papers presented by leading researchers at the International Workshop on Robust Control held in San Antonio, Texas in March 1991. The common theme tying these papers together is the analysis, synthesis, and design of control systems subject to various uncertainties. The papers describe the latest results in parametric uncertainty, H_∞ uncertainty, I₁ optical control, and Quantitative Feedback Theory (QFT). The book is the first to bring together all the diverse points of view addressing the robust control problem and should strongly influence development in the robust control field for years to come. For this reason, control theorists, engineers, and applied mathematicians should consider it a crucial acquisition for their libraries.

Tough Test Questions? Missed Lectures? Not Enough Time? Fortunately for you, there's Schaum's. This all-in-one-package includes more than 700 fully solved problems, examples, and practice exercises to sharpen your problem-solving skills. Plus, you will have access to 20 detailed videos featuring instructors who explain the most commonly tested problems--it's just like having your own virtual tutor! You'll find everything you need to build confidence, skills, and knowledge for the highest score possible. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you 700 fully solved problems Extra practice on topics such as differential equations and linear systems, transfer functions, block diagram algebra, and more Support for all major textbooks for feedback and control systems courses Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time--and get your best test scores! Schaum's Outlines--Problem Solved.

This book provides a wide variety of state-space--based numerical algorithms for the synthesis of feedback algorithms for linear systems with input saturation. Specifically, it addresses and solves the anti-windup problem, presenting the objectives and terminology of the problem, the mathematical tools behind anti-windup algorithms, and more than twenty algorithms for anti-windup synthesis, illustrated with examples. Luca Zaccarian and Andrew Teel's modern method--combining a state-space approach with algorithms generated by solving linear matrix inequalities--treats MIMO and SISO systems with equal ease. The book, aimed at control engineers as well as graduate students, ranges from very simple anti-windup construction to sophisticated anti-windup algorithms for nonlinear systems. Describes the fundamental objectives and principles behind anti-windup synthesis for control systems with actuator saturation Takes a modern, state-space approach to synthesis that applies to both SISO and MIMO systems Presents algorithms as linear matrix inequalities that can be readily solved with widely available software Explains mathematical concepts that motivate synthesis algorithms Uses nonlinear performance curves to quantify performance relative to disturbances of varying magnitudes Includes anti-windup algorithms for a class of Euler-Lagrange nonlinear systems Traces the history of anti-windup research through an extensive annotated bibliography For senior-level or first-year graduate-level courses in control analysis and design, and related courses within engineering, science, and management Feedback Control of Dynamic Systems covers the material that every engineer, and most scientists and prospective managers, needs to know about feedback control--including concepts like stability, tracking, and robustness. Each chapter presents the fundamentals along with comprehensive, worked-out examples, all within a real-world context and with historical background information. The authors also provide case studies with close integration of MATLAB throughout. Teaching and Learning Experience This program will provide a better teaching and learning experience--for you and your students. It will provide: *An Understandable Introduction to Digital Control: This text is devoted to supporting students equally in their need to grasp both traditional and more modern topics of digital control. *Real-world Perspective: Comprehensive Case Studies and extensive integrated MATLAB/SIMULINK examples illustrate real-world problems and applications.*Focus on Design: The authors focus on design as a theme early on and throughout the entire book, rather than focusing on analysis first and design much later.

Hysteresis phenomena are common in numerous physical, mechanical, ecological and biological systems. They reflect memory effects and process irreversibility. The use of hysteresis operators (hysterons) offers an approach to macroscopic modelling of the dynamics of phase transitions and rheological systems. The applications cover processes in electromagnetism, elastoplasticity and population dynamics in particular. Hysterons are also typical elements of control systems where they represent thermostats and other discontinuous controllers with

memory. The book offers the first systematic mathematical treatment of hysteresis nonlinearities. Construction procedures are set up for hysterons in various function spaces, in continuous and discontinuous cases. A general theory of variable hysterons is developed, including identification and stability questions. Both deterministic and non-deterministic hysterons are considered, with applications to the study of feedback systems. Many of the results presented - mostly obtained by the authors and their scientific group - have not been published before. The book is essentially self contained and is addressed both to researchers and advanced students.

Algebraic Identification and Estimation Methods in Feedback Control Systems presents a model-based algebraic approach to online parameter and state estimation in uncertain dynamic feedback control systems. This approach evades the mathematical intricacies of the traditional stochastic approach, proposing a direct model-based scheme with several easy-to-implement computational advantages. The approach can be used with continuous and discrete, linear and nonlinear, mono-variable and multi-variable systems. The estimators based on this approach are not of asymptotic nature, and do not require any statistical knowledge of the corrupting noises to achieve good performance in a noisy environment. These estimators are fast, robust to structured perturbations, and easy to combine with classical or sophisticated control laws. This book uses module theory, differential algebra, and operational calculus in an easy-to-understand manner and also details how to apply these in the context of feedback control systems. A wide variety of examples, including mechanical systems, power converters, electric motors, and chaotic systems, are also included to illustrate the algebraic methodology. Key features: Presents a radically new approach to online parameter and state estimation. Enables the reader to master the use and understand the consequences of the highly theoretical differential algebraic viewpoint in control systems theory. Includes examples in a variety of physical applications with experimental results. Covers the latest developments and applications. Algebraic Identification and Estimation Methods in Feedback Control Systems is a comprehensive reference for researchers and practitioners working in the area of automatic control, and is also a useful source of information for graduate and undergraduate students.

A groundbreaking book from Simon Haykin, setting out the fundamental ideas and highlighting a range of future research directions.

For senior-level or first-year graduate-level courses in control analysis and design, and related courses within engineering, science, and management Feedback Control of Dynamic Systems covers the material that every engineer, and most scientists and prospective managers, needs to know about feedback control—including concepts like stability, tracking, and robustness. Each chapter presents the fundamentals along with comprehensive, worked-out examples, all within a real-world context and with historical background information. The authors also provide case studies with close integration of MATLAB throughout. Teaching and Learning Experience This program will provide a better teaching and learning experience—for you and your students. It will provide: An Understandable Introduction to Digital Control: This text is devoted to supporting students equally in their need to grasp both traditional and more modern topics of digital control. Real-world Perspective: Comprehensive Case Studies and extensive integrated MATLAB/SIMULINK examples illustrate real-world problems and applications. Focus on Design: The authors focus on design as a theme early on and throughout the entire book, rather than focusing on analysis first and design much later. The full text downloaded to your computer With eBooks you can: search for key concepts, words and phrases make highlights and notes as you study share your notes with friends eBooks are downloaded to your computer and accessible either offline through the Bookshelf (available as a free download), available online and also via the iPad and Android apps. Upon purchase, you will receive via email the code and instructions on how to access this product. Time limit The eBooks products do not have an expiry date. You will continue to access your digital ebook products whilst you have your Bookshelf installed.

"This revision of a top-selling textbook on feedback control provides greater instructor flexibility and student readability. Chapter 4 on A First Analysis of Feedback has been substantially rewritten to present the material in a more logical and effective manner. A new case study on biological control introduces an important new area to the students, and each chapter now includes a historical perspective to illustrate the origins of the field. As in earlier editions, the book has been updated so that solutions are based on the latest versions of MATLAB and SIMULINK."--BOOK JACKET.

Based on the results of over 10 years of research and development by the authors, this book presents a broad cross section of dynamic programming (DP) techniques applied to the optimization of dynamical systems. The main goal of the research effort was to develop a robust path planning/trajectory optimization tool that did not require an initial guess. The goal was partially met with a combination of DP and homotopy algorithms. DP algorithms are presented here with a theoretical development, and their successful application to variety of practical engineering problems is emphasized.

This text covers the material that every engineer, and most scientists and prospective managers, needs to know about feedback control, including concepts like stability, tracking, and robustness. Each chapter presents the fundamentals along with comprehensive, worked-out examples, all within a real-world context.

This book presents up-to-date research developments and novel methodologies to solve various stability and control problems of dynamic systems with time delays. First, it provides the new introduction of integral and summation inequalities for stability analysis of nominal time-delay systems in continuous and discrete time domain, and presents corresponding stability conditions for the nominal system and an applicable nonlinear system. Next, it investigates several control problems for dynamic systems with delays including $H(\infty)$ control problem Event-triggered control problems; Dynamic output feedback control problems; Reliable sampled-data control problems. Finally, some application topics covering filtering, state estimation, and synchronization are considered. The book will be a valuable resource and guide for graduate students, scientists, and engineers in the system sciences and control communities.

This monograph presents a simple and efficient two-relay control algorithm for generation of self-excited oscillations of a desired amplitude and frequency in dynamic systems. Developed by the authors, the two-relay controller consists of two relays switched by the feedback received from a linear or nonlinear system, and represents a new approach to the self-generation of periodic motions in underactuated mechanical systems. The first part of the book explains the design procedures for two-relay control using three different methodologies – the describing-function method, Poincaré maps, and the locus-of-a-perturbed-relay-system method – and concludes with stability analysis of designed periodic oscillations. Two methods to ensure the robustness of two-relay control algorithms are explored in the second part, one based on the combination of the high-order sliding mode controller and backstepping, and the other on higher-order sliding-modes-based reconstruction of uncertainties and their compensation where Lyapunov-based stability analysis of tracking error is used. Finally, the third part illustrates applications of self-oscillation generation by a two-relay control with a Furuta pendulum, wheel pendulum, 3-DOF underactuated robot, 3-DOF laboratory helicopter, and fixed-phase electronic circuits. Self-Oscillations in Dynamic Systems will appeal to engineers, researchers, and graduate students working on the tracking and self-generation of periodic motion of electromechanical systems, including non-minimum-phase systems. It will also be of interest to mathematicians working on analysis of periodic solutions. Upper-level undergraduate text introduces aspects of optimal control theory: dynamic programming, Pontryagin's minimum principle, and numerical techniques for trajectory optimization. Numerous figures,

tables. Solution guide available upon request. 1970 edition.

This book is a tribute to Professor Laurent Praly and follows on from a workshop celebrating the occasion of his 60th birthday. It presents new and unified visions of the numerous problems that Laurent Praly has worked on in his prolific career: adaptive control, output feedback and observers, stability and stabilization. His main contributions are the central topic of this book. The book collects contributions written by prominent international experts in the control community, addressing a rich variety of topics: emerging ideas, advanced applications, and theoretical concepts. Organized in three sections, the first section covers the field of adaptive control, where Laurent Praly started his career. The second section focuses on stabilization and output feedback, which is also the topic of the second half of his career. Lastly, the third section presents the emerging research that will form Laurent Praly's scientific legacy.

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