

Optimal Control Theory And Static Optimization In Economics Hardcover

Control Theory Introduction to Control Theory, Including Optimal Control Optimal Control Control Theory and Optimization Control Theory and its Applications Control Theory and Its Applications Advances in Control Theory and Applications Modern Control Theory Analysis and Geometry in Control Theory and its Applications The Dynamics of Control Optimal Control Theory Control Theory Control Theory and Design Nonlinear Model Predictive Control Control Theory and Optimization Optimal Control Theory New Directions and Applications in Control Theory Introduction to Control Theory Control Theory of Systems Governed by Partial Differential Equations Robust Control Systems Francisco Miranda David N. Burghes Michael Athans Michail I. Zelikin Roxin Vito G. Massari Claudio Bonivento Zdzislaw Bubnicki Piernicola Bettiol Fritz Colonius Donald E. Kirk Torkel Glad Patrizio Colaneri Lars Grüne Suresh P. Sethi Wijesuriya P. Dayawansa O. L. R. Jacobs A.K. Aziz Uwe Mackenroth

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control theory is a field of applied mathematics and engineering that deals with the basic principles underlying the analysis and design of control systems controlling a system means to influence the behavior of the system in order to achieve a desired goal control theory deals with the use of a controller to achieve this purpose control theory has been recognized as a mathematical subject since the 1960 s it has contributed to scientific and technological progress in many areas over the last few decades control theory has been extensively used in modern society from simple applications such as temperature devices to sophisticated systems in space flight the aim of this book is to solve different problems concerning control systems this book joins a number of recent works in

control theory and is useful as a source for researchers in this field concerning control systems

geared toward advanced undergraduate and graduate engineering students this text introduces the theory and applications of optimal control it serves as a bridge to the technical literature enabling students to evaluate the implications of theoretical control work and to judge the merits of papers on the subject rather than presenting an exhaustive treatise optimal control offers a detailed introduction that fosters careful thinking and disciplined intuition it develops the basic mathematical background with a coherent formulation of the control problem and discussions of the necessary conditions for optimality based on the maximum principle of pontryagin in depth examinations cover applications of the theory to minimum time minimum fuel and to quadratic criteria problems the structure properties and engineering realizations of several optimal feedback control systems also receive attention special features include numerous specific problems carried through to engineering realization in block diagram form the text treats almost all current examples of control problems that permit analytic solutions and its unified approach makes frequent use of geometric ideas to encourage students intuition

the general context of this book is applied to systems in n dimensional space emphasis is placed on a general approach to control theory independent of optimization and demonstrates a novel approach by converting a given dynamical system into a control system in order to obtain a deeper understanding of its mode of action contents of the monograph include a presentation of the basic concepts and results of control theory the typical and classical behaviour of control systems techniques for transforming dynamic systems into control systems and the systematic approach to study control systems in applications as shown in many examples

control theory is a theory that deals with influencing the behaviour of dynamical systems and an interdisciplinary sub field of science which originated in engineering and mathematics and evolved into use by the social sciences such as psychology sociology and criminology in this book the authors present and discuss topical data on control theory relating to these fields

this volume is the outcome of the first easy workshop on advances in control theory and applications which was held at university of bologna on may 22 26 2006 it consists of selected contributions by some of the invited speakers and contains recent results in control the volume is intended for engineers researchers and students in control engineering

well written practice oriented textbook and compact textbook presents the contemporary state of the art of control theory and its applications introduces traditional problems that are useful in the automatic control of technical processes plus presents current issues of control explains methods can be easily

applied for the determination of the decision algorithms in computer control and management systems

since the 1950s control theory has established itself as a major mathematical discipline particularly suitable for application in a number of research fields including advanced engineering design economics and the medical sciences however since its emergence there has been a need to rethink and extend fields such as calculus of variations differential geometry and nonsmooth analysis which are closely tied to research on applications today control theory is a rich source of basic abstract problems arising from applications and provides an important frame of reference for investigating purely mathematical issues in many fields of mathematics the huge and growing scope of activity has been accompanied by fragmentation into a multitude of narrow specialties however outstanding advances are often the result of the quest for unifying themes and a synthesis of different approaches control theory and its applications are no exception here the interaction between analysis and geometry has played a crucial role in the evolution of the field this book collects some recent results highlighting geometrical and analytical aspects and the possible connections between them applications provide the background in the classical spirit of mutual interplay between abstract theory and problem solving practice

this new text reference is an excellent resource for the foundations and applications of control theory and nonlinear dynamics all graduates practitioners and professionals in control theory dynamical systems perturbation theory engineering physics and nonlinear dynamics will find the book a rich source of ideas methods and applications with its careful use of examples and detailed development it is suitable for use as a self study reference guide for all scientists and engineers

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 is a textbook designed for an advanced course in control theory currently most textbooks on the subject either looks at multivariate systems or non linear systems however control theory is the only textbook available that covers both it explains current developments in these two types of control techniques and looks at tools for computer aided design for example matlab and its toolboxes to make full use of computer design tools a good understanding of their theoretical basis is necessary and to enable this the book presents relevant mathematics clearly and simply the practical limits of control systems are explored and the relevance of these to control design are discussed control theory is an ideal textbook for final year undergraduate and postgraduate courses and the student will be helped by a series of exercises at the end of each chapter professional engineers will also welcome it as a core reference

control systems design methodologies have long suffered the traditional and myopic dichotomy between time and frequency domain approaches each of them being specialized to cope with only scarcely overlapping performance requirements this book is aimed at bridging the two approaches by presenting design methodologies based on the minimization of a norm h_2 of a suitable transfer function a distinctive feature of these techniques is the fact that they do not create only one solution to the design problem instead they provide a whole set of admissible solutions which satisfy a constraint on the maximum deterioration of the performance index a systematic book on this topic is long overdue self contained and practical in its approach control theory and design enables the reader to use the relevant techniques in various real life applications the text covers the basic facts of robust control and theory as well as more recent achievements such as robust stability and robust performance in presence of parameter uncertainties it features a new perspective on classical lq results and further sections on robust synthesis nonclassical optimization problems and analysis and synthesis of uncertain systems control theory and design is essential reading for graduates and those entering the research field the required mathematical background is provided so that the book is also suitable for undergraduate students with some knowledge of basic systems and control provides a self contained manual for learning control systems and design contains a clear and concise presentation of the technical background needed includes a new perspective of classical lq results contains updated results and novel contributions to nonstandard h_2 h_∞ problems covers all the theory from the basic to the more advanced issues

nonlinear model predictive control is a thorough and rigorous introduction to nonlinear model predictive control nmpc for discrete time and sampled data systems nmpc is interpreted as an approximation of infinite horizon optimal control so that important properties like closed loop stability inverse optimality and suboptimality can be derived in a uniform manner these results are complemented by discussions of feasibility and robustness nmpc schemes with and without stabilizing terminal constraints are detailed and intuitive examples illustrate the performance of different nmpc variants an introduction to nonlinear optimal control algorithms gives insight into how the nonlinear optimisation routine the core of any nmpc controller works an appendix covering nmpc software and accompanying software in matlab and c downloadable from springer.com isbn enables readers to perform computer experiments exploring the possibilities and limitations of nmpc

this fully revised 3rd edition offers an introduction to optimal control theory and its diverse applications in management science and economics it brings to students the concept of the maximum principle in continuous as well as discrete time by using dynamic programming and kuhn tucker theory while some mathematical background is needed the emphasis of the book is not on mathematical rigor but on modeling realistic situations faced in business and economics the book exploits optimal control theory to the functional areas of management including finance production and marketing and to economics of growth and of natural resources in addition this new edition features materials on stochastic nash and stackelberg differential games and an adverse selection

model in the principal agent framework the book provides exercises for each chapter and answers to selected exercises to help deepen the understanding of the material presented also included are appendices comprised of supplementary material on the solution of differential equations the calculus of variations and its relationships to the maximum principle and special topics including the kalman filter certainty equivalence singular control a global saddle point theorem sethi skiba points and distributed parameter systems optimal control methods are used to determine optimal ways to control a dynamic system the theoretical work in this field serves as a foundation for the book which the author has applied to business management problems developed from his research and classroom instruction the new edition has been completely refined and brought up to date ultimately this should continue to be a valuable resource for graduate courses on applied optimal control theory but also for financial and industrial engineers economists and operational researchers concerned with the application of dynamic optimization in their fields

this volume contains a collection of papers in control theory and applications presented at a conference in honor of clyde martin on the occasion of his 60th birthday held in lubbock texas november 14 15 2003

this introduction to the theory of feedback control systems covers the whole of control theory unifying various relevant topics in a single volume although the material of the book is essentially mathematical there is minimal emphasis on the technical mathematical niceties hardly needed to generate insights about control systems much of this second edition has been rewritten to take account of recent developments in control theory and how it is understood successful features have been retained from the first edition including the uniform treatment of both continuous time and discrete time systems the inclusion of a wide range of topic and the provision of problems with answers making it ideal in format and content for undergraduates and graduates in engineering science

control theory of systems governed by partial differential equations covers the proceedings of the 1976 conference by the same title held at the naval surface weapons center silver spring maryland the purpose of this conference is to examine the control theory of partial differential equations and its application this text is divided into five chapters that primarily focus on tutorial lecture series on the theory of optimal control of distributed systems it describes the many manifestations of the theory and its applications appearing in the other chapters this work also presents the principles of the duality and asymptotic methods in control theory including the variational principle for the heat equation a chapter highlights systems that are not of the linear quadratic type this chapter also explores the control of free surfaces and the geometrical control variables the last chapter provides a summary of the features and applications of the numerical approximation of problems of optimal control this book will prove useful to mathematicians engineers and researchers

self contained introduction to control theory that emphasizes on the most modern designs for high performance and robustness it assumes no previous coursework and offers three chapters of key topics summarizing classical control to provide readers with a deeper understanding of robust control theory than would be otherwise possible the text incorporates mathematical derivations and proofs includes many elementary examples and advanced case studies using matlab toolboxes

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Introduction

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