DONALD E. KIRK

OPTIMAL CONTROL THEORY

AN INTRODUCTION

Optimal Control An Introduction

O. L. R. Jacobs

Optimal Control An Introduction:

Optimal Control Michael Athans,Peter L. Falb,2013-04-26 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 **Optimal Control Theory** Donald E. Kirk,2004-01-01 Geared toward upper level undergraduates this text introduces three aspects of optimal control theory dynamic programming Pontryagin s minimum principle and numerical techniques for trajectory optimization Numerous problems which introduce additional topics and illustrate basic concepts appear throughout the text Solution guide available upon request 131 figures 14 tables 1970 edition **Optimal Control** Leslie M. Hocking,1991 Systems that evolve with time occur frequently in nature and modelling the behaviour of such systems provides an important application of mathematics These systems can be completely deterministic but it may be possible too to control their behaviour by intervention through controls The theory of optimal control is concerned with determining such controls which at minimum cost either direct the system along a given trajectory or enable it to reach a given point in its state space This textbook is a straightforward introduction to the theory of optimal control with an emphasis on presenting many different applications Professor Hocking has taken pains to ensure that the theory is developed to display the main themes of the arguments but without using sophisticated mathematical tools Problems in this setting can arise across a wide range of subjects and there are illustrative examples of systems from as diverse fields as dynamics economics population control and medicine Throughout there are many worked examples and numerous exercises with solutions are provided **Optimal Control Theory** Donald E. Kirk,1976 Introduction to Control Theory, Including Optimal Control David N. Burghes,Alexander Graham,1980 **Introduction to Optimal Control Theory** Aaron Strauss,1982 **An Introduction to Optimal Control Theory** Aaron Strauss,2012-12-06 This paper is intended for the beginner It is not a state of the art paper for research workers in the field of control theory Its purpose is to introduce the reader to some of the problems and results in control theory to illustrate the application of these re sults and to provide a guide for his further reading on this subject I have tried to motivate the results with examples especial ly with one

canonical simple example described in 3 Many results such as the maximum principle have long and difficult proofs I have omitted these proofs In general I have included only the proofs which are either 1 not too difficult or 2 fairly enlightening as to the nature of the result I have however usually attempted to draw the strongest conclusion from a given proof For example many existing proofs in control theory for compact targets and uniqueness of solutions also hold for closed targets and non uniqueness Finally at the end of each section I have given references to generalizations and origins of the results discussed in that section I make no claim of completeness in the references however as I have often been content merely to refer the reader either to an exposition or to a paper which has an extensive bibliography IV These 1ecture notes are revisions of notes I used for aseries of nine 1ectures on contro1 theory at the International Summer Schoo1 on Mathematica1 Systems and Economics held in Varenna Ita1y June 1967 **Optimal Control** Peter Lawrence Falb,2000 **An Introduction to Applied Optimal Control** Knowles,1982-03-18 An Introduction to Applied Optimal Control Optimal Control Arturo Locatelli,2001-03 From the reviews The style of the book reflects the author s wish to assist in the effective learning of optimal control by suitable choice of topics the mathematical level used and by including numerous illustrated examples In my view the book suits its function and purpose in that it gives a student a comprehensive coverage of optimal control in an easy to read fashion Measurement and Control **Optimal Control Theory** Suresh P. Sethi,2018-11-28 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 **An Introduction to Optimal Control**

Theory Onésimo Hernández-Lerma,Leonardo R. Laura-Guarachi,Saul Mendoza-Palacios,David González-Sánchez,2023-02-21 This book introduces optimal control problems for large families of deterministic and stochastic systems with discrete or continuous time parameter These families include most of the systems studied in many disciplines including Economics Engineering Operations Research and Management Science among many others The main objective is to give a concise systematic and reasonably self contained presentation of some key topics in optimal control theory To this end most of the analyses are based on the dynamic programming DP technique This technique is applicable to almost all control problems that appear in theory and applications They include for instance finite and infinite horizon control problems in which the underlying dynamic system follows either a deterministic or stochastic difference or differential equation In the infinite horizon case it also uses DP to study undiscounted problems such as the ergodic or long run average cost After a general introduction to control problems the book covers the topic dividing into four parts with different dynamical systems control of discrete time deterministic systems discrete time stochastic systems ordinary differential equations and finally a general continuous time MCP with applications for stochastic differential equations The first and second part should be accessible to undergraduate students with some knowledge of elementary calculus linear algebra and some concepts from probability theory random variables expectations and so forth Whereas the third and fourth part would be appropriate for advanced undergraduates or graduate students who have a working knowledge of mathematical analysis derivatives integrals and stochastic processes *Optimal Control* Arturo Locatelli,2013-09-14 From the reviews The style of the book reflects the author s wish to assist in the effective learning of optimal control by suitable choice of topics the mathematical level used and by including numerous illustrated examples In my view the book suits its function and purpose in that it gives a student a comprehensive coverage of optimal control in an easy to read fashion Measurement and Control Optimal Control -an Introduction To The Theory Its Applications- Athans M., *Introduction to Optimal Control* Ian McCausland,1968

Introduction to Control Theory O. L. R. Jacobs,1993 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 **An introduction to applied optimal control** Greg Knowles,1981 *Optimal Control Theory* ,1967 **Calculus of Variations and Optimal Control Theory** Daniel Liberzon,2012-01-08 This textbook offers a concise yet rigorous introduction to calculus of variations and optimal control theory and is a self contained resource for graduate students in engineering applied mathematics and

related subjects Designed specifically for a one semester course the book begins with calculus of variations preparing the ground for optimal control It then gives a complete proof of the maximum principle and covers key topics such as the Hamilton Jacobi Bellman theory of dynamic programming and linear quadratic optimal control Calculus of Variations and Optimal Control Theory also traces the historical development of the subject and features numerous exercises notes and references at the end of each chapter and suggestions for further study Offers a concise yet rigorous introduction Requires limited background in control theory or advanced mathematics Provides a complete proof of the maximum principle Uses consistent notation in the exposition of classical and modern topics Traces the historical development of the subject Solutions manual available only to teachers Leading universities that have adopted this book include University of Illinois at Urbana Champaign ECE 553 Optimum Control Systems Georgia Institute of Technology ECE 6553 Optimal Control and Optimization University of Pennsylvania ESE 680 Optimal Control Theory University of Notre Dame EE 60565 Optimal Control

Introduction to Optimal Control I. McCausland,1977

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