Optimal Control An Introduction

Optimal ControlMathematical Introduction to Control Theory, a (Third Edition)An Introduction to Control SystemsAn Introduction to Control SystemsOptimal Control TheoryIntroduction to Process Control, Second EditionIntroduction to Control Theory, Including Optimal ControlIntroduction to Control TheoryIntroduction to Control EngineeringIntroduction to Optimal Control TheoryAn introduction to the theory of control in mechanical engineeringIntroduction to Advanced Soft RoboticsIntroduction to Health and Safety in ConstructionIntroduction to Control System TechnologyIntroduction to Avionics SystemsIntroduction To Control Systems, 3Rd EditionAn Introduction to LTEReal Time Computer Control: an IntroductionControl System DesignElectrical Engineer's Reference Book Michael Athans Shlomo Engelberg K. Warwick K. Warwick Donald E. Kirk Jose A. Romagnoli David N. Burghes O. L. R. Jacobs Ajit K. Mandal Jack Macki R... H. Macmillan Juntian Qu Phil Hughes Robert Bateson R.P.G. Collinson Anand Christopher Cox Stuart Bennett Bernard Friedland M A Laughton

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 3rd edition strikes a nice balance between mathematical rigor and engineering oriented applications helping students to understand the mathematical and engineering aspects of control theory the book makes effective use of the tools provided by matlab r and includes material about using the tools provided by the python r programming language in the design and analysis of control systems without allowing the computer based tools to substitute for knowledge of control theory the examples in the text are carefully designed to develop the student s intuition in both mathematics and engineering with over 90 solved homework problems and about 200 figures this invaluable title will benefit junior and senior level university students in engineering

this significantly revised edition presents a broad introduction to control systems and balances new modern methods with the more classical it is an excellent text for use as a first course in control systems by undergraduate students in all branches of engineering and applied mathematics the book contains a comprehensive coverage of automatic control integrating digital and computer control techniques and their implementations the practical issues and problems in control system design the three term pid controller the most widely used controller in industry today numerous in chapter worked examples and end of chapter exercises this second edition also includes an introductory guide to some more recent developments namely fuzzy logic control and neural networks

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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

introduction to process control second edition provides a bridge between the traditional view of process control and the current expanded role by blending conventional topics with a broader perspective of more integrated process operation control and information systems updating and expanding the content of its predecessor this second edition addresses issues in today s teaching of process control teaching learning principles presents a concept first followed by an example allowing students to grasp theoretical concepts in a practical manner uses the same problem in each chapter culminating in a complete control design strategy includes 50 percent more exercises content defines the traditional and expanded roles of process control in modern manufacturing introduces the link between process optimization and process control optimizing control including the effect of disturbances on the optimal plant operation the concepts of steady state and dynamic backoff as ways to quantify the economic benefits of control and how to determine an optimal transition policy during a planned production change incorporates an introduction to the modern architectures of industrial computer control systems with real case studies and applications to pilot scale operations discusses the expanded role of process control in modern manufacturing including model centric technologies and integrated control systems integrates data processing reconciliation and intelligent monitoring in the overall control system architecture resource the book s website offers a user friendly software environment for interactively studying the examples in the text the site contains the matlab toolboxes for process control education as well as the main simulation examples from the book access the site through the authors websites at pseonline net and chms ucdavis edu research web pse ahmet drawing on the authors combined 50 years of teaching experiences this classroom tested text is designed for chemical engineering students but is also suitable for industrial practitioners who need to understand key concepts of process control and how to implement them the authors help readers see how traditional process control has evolved into an integrated operational environment used to run modern manufacturing facilities

the text is written from the engineer s point of view to explain the basic oncepts involved in feedback control theory the material in the text has been organized for gradual and sequential development of control theory starting with a statement of the task of a control engineer at the very outset the book is tended for an introductory undergraduate course in control systems for engineering students this text presents a comprehensive analysis and design of continuous time control systems and includes more than introductory material for discrete systems with adequate guidelines to extend the results derived in connection continuous time systems the prerequisite for the reader is some elementary owledge of differential equations vector matrix analysis and mechanics transfer function and state variable models of typical components and subsystems have been derived in the appendix at the end of the book most of the materials including solved and unsolved problems presented in the book have been class tested in senior undergraduates and first year graduate el courses in the field of control systems at the electronics and telecommunication engineering department jadavpur university matlab is the most widely used cad software package in universities throughout the world some representative matlab scripts used for solving problems are cluded at the end of each chapter the detailed design steps of fuzzy logic based controller using simulink and matlab has been provided in the book to give the student a head start in this emerging discipline a chapter has been included to deal with nonlinear components and their analysis g matlab and simulink through user defined s functions finally a chapter has been included to deal with the implementation of digital controllers on finite bit computer to bring out the problems associated with digital trollers in view of extensive use of matlab for rapid verification of controller designs some notes for using matlab script m files and function m files are included at the end of the book

this monograph is an introduction to optimal control theory for systems governed by vector ordinary differential equations it is not intended as a state of the art handbook for researchers we have tried to keep two types of reader in mind 1 mathematicians graduate students and advanced undergraduates in mathematics who want a concise introduction to a field which contains nontrivial interesting applications of mathematics for example weak convergence convexity and the theory of ordinary differential equations 2 economists applied scientists and engineers who want to understand some of the mathematical foundations of optimal control theory in general we have emphasized motivation and explanation avoiding the definition axiom theorem proof approach we make use of a large number of examples especially one simple canonical example which we carry through the entire book in proving theorems we often just prove the simplest case then state the more general results which can be proved many of the more difficult topics are discussed in the notes sections at the end of chapters and several major proofs are in the appendices we feel that a solid

understanding of basic facts is best attained by at first avoiding excessive generality we have not tried to give an exhaustive list of references preferring to refer the reader to existing books or papers with extensive bibliographies references are given by author s name and the year of publication e g waltman 1974

introduction to advanced soft robotics is an introductory textbook on soft body robotics the content is designed to enable readers to better understand soft body robotics starting with an introduction to the subject contents explain fundamental concepts such as perception and sensing fabrication techniques and material design these introductory chapters demonstrate the design concept and related design structures of soft robots from multiple perspectives which can provide considerable design references for robotics learners and enthusiasts next the book explains modeling and control for soft robotics and the applications key features of this book include easy to understand language and format simple illustrations and a balanced overview of the subject including a section on challenges and future prospects for soft robotics and scientific references

introduction to health and safety in construction covers the specific challenges faced by the construction industry as well as the basics of occupational safety and health in general the coverage of this book has been directly matched to the certificate course in construction safety and health from nebosh however the comprehensive coverage of health and safety topics in a construction context make it relevant for other courses in construction design and management construction safety and health and the built environment both in the uk and overseas as well as for construction professionals who are looking for an introduction to health and safety which addresses the specific problems encountered in their industry in its second edition the book has been updated to incorporate changes in legislation regarding noise vibration coshh work at height fire safety construction design and management asbestos the text is highly illustrated in full colour easy to read and includes self assessment questions taken directly from nebosh examinations a chapter on study skills offers support for professionals returning to study the text is also supported with checklists report forms and record sheets making it a valuable reference tool for construction managers supervisors designers building and civil engineers to consult on the day to day issues of health and safety

evaluation copies are available please contact textbooks wkap com provide the course number number of students and present textbook used introduction to avionics systems second edition explains the basic principles and underlying theory of modern avionic systems and how they are implemented with current technology for both civil and military aircraft in a clear and easy to read manner all systems are explained so that their design and performance can be understood and analysed worked examples

are included to illustrate the application of the theory and principles covered the latest developments and directions of research for future systems are included this new second edition has approximately 25 new material and takes into account the technology developments which have taken place since the first edition was published in january 1996 the book is well illustrated with line drawings and photos with some in colour where appropriate readership graduates or equivalent from a range of disciplines entering the avionics and aerospace industries engineers at all levels engaged in the design and development of avionic systems and equipment in the avionic and aerospace industries students and post graduate students taking avionics and aeronautical engineering courses staff in the armed services and civil airlines engaged in the support or operation of aircraft who wish to acquire a deeper understanding of the design and implementation of avionic systems and equipment

since the printing of the first two editions the use of computer software by students has become an important adjunct to the teaching and learning of control systems analysis with this the entire text has been enlarged and strengthened in the third edition in addition an attempt has been made to broaden the scope of the book so that it is suitable for mechanical and electrical engineering students as well as other students of control systems content highlights introduction modeling of physical systems models for control systems time response classical method time response state equations method performance crieteria assessing stability and performance control stretegies and plant sizing system compensation discrete time control systems non linear control systems systems with stochastic inputs adaptive control systems laplace and z transforms symbols and analogous systems fundamentals of matrix theory computer software for control index

an introduction to lte explains the technology used by 3gpp long term evolution the book covers the whole of lte both the techniques used for radio communication between the base station and the mobile phone and the techniques used for signalling communication and data transport in the evolved packet core it avoids unnecessary detail focussing instead on conveying a sound understanding of the entire system the book is aimed at mobile telecommunication professionals who want to understand what lte is and how it works it is invaluable for engineers who are working on lte notably those who are transferring from other technologies such as umts and cdma2000 those who are experts in one part of lte but who want to understand the system as a whole and those who are new to mobile telecommunications altogether it is also relevant to those working in non technical roles such as project managers marketing executives and intellectual property consultants on completing the book the reader will have a clear understanding of lte and will be able to tackle the more specialised books and the 3gpp specifications with confidence key features covers the latest developments in release 10 of the 3gpp specifications including the new capabilities of lte advanced includes references to individual sections of the 3gpp specifications to

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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 and more 1986 edition

electrical engineer s reference book fourteenth edition focuses on electrical engineering the book first discusses units mathematics and physical quantities including the international unit system physical properties and electricity the text also looks at network and control systems analysis the book examines materials used in electrical engineering topics include conducting materials superconductors silicon insulating materials electrical steels and soft irons and relay steels the text underscores electrical metrology and instrumentation steam generating plants turbines and diesel plants and nuclear reactor plants the book also discusses alternative energy sources concerns include wind geothermal wave ocean thermal solar and tidal energy the text then looks at alternating current generators stator windings insulation output equation armature reaction and reactants and time constraints are described the book also examines overhead lines cables power transformers switchgears and protection supply and control of reactive power and power systems operation and control the text is a vital source of reference for readers interested in electrical engineering

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