Positive Dynamical Systems in Discrete Time
Ulrich Kruse 2013-11-27 This book provides a systematic, rigorous and self-contained treatment of positive dynamical systems. A dynamical system is positive when all relevant variables of a system are nonnegative in a natural way. This is in biology, demography, or economics, where the levels of populations or price of goods are positive. The principle also finds application in electrical engineering, physics and computer sciences. "The authors have greatly expanded the field of positive systems in surprising ways. " - Prof. Dr. David G. Luenberger, Stanford University/USA.
The Routledge Handbook of Nonlinear Control Theory and its Applications 2016-02-26 The exponential growth and development of modern technologies in all sectors has made it increasingly difficult for students, teachers and teachers' educators to know which technologies to employ and how best to take advantage of them. The Routledge Handbook of Language Learning and Technology brings together experts in a number of key areas of development and change, and opens the field of language learning by exploring the pedagogical importance of technological innovation. The handbook is structured around three themes: historical and conceptual contextualisation, pedagogical and technological innovations for language learning, and language learning purposes, design and language learning resources. Led by fundamental concepts, theories and frameworks from language learning and teaching research rather than by specific technologies, this handbook is the essential reference for all students, teachers and researchers of Language Learning and TEL. Those working in the areas of Application, Online, E-learning and Media will find this book valuable.
Fundamentals of Computer Organization and Architecture Mario A. Valero 2015-02-22 This is the first book in the two-volume set offering comprehensive cover of the field of computer organization and architecture. This book provides comprehensive coverage of the subjects pertaining introductory courses in computer organization and architecture, including: * Instruction set architecture and design * Assembly language programming * Computer arithmetic * Processing unit design * Memory system design * Input-output design and organization * Pipelining design techniques * Reduced Instruction Set Computers (RISCs) The authors, who share over 15 years of undergraduate and graduate-level instruction in computer architecture, provide real workloads, examples of machines, case studies and practical experiences in each chapter.
Artificial Intelligence David L. Poole 2017-09-25 Artificial Intelligence presents a practical guide to AI, including agents, machine learning and problem-solving simple and complex domains. Dynamic Search Luo: Pronounced 1999-08-27 Certain algorithms that are known to converge can be renormalized or "scaled up" at each iteration so that their local behavior can be seen. This creates dynamical systems that can be studied with tools from geometry, such as ergodic theory, chaos, special attractors, and Lyapunov exponents. Furthermore, we can translate the rates of convergence into less studied exponents known as Renyi exponents. This all feeds back to suggest new algorithms with faster rates of convergence. For example, in line-search, we can improve upon the Golden Section algorithm with new classes of algorithms that have their own special and sometimes chaotic-dynamical systems. The elliptoidal algorithm of linear and convex programming have fast, "deep cut" versions whose dynamical properties create cyclic attractors. And ordinary descent has, buried within, a beautiful fractal that controls the gateway to a special two-point attractor. Faster "relaxed" versions exhibit classical period doubling. Dynamic Search presents a stimulating introduction to a broad new field - the union of dynamical systems and optimization. It combines tools of discrete mathematics and optimization, such as integer linear programming, with classical methods of optimal control. Bayesian Filtering and Smoothing Simon Sirkovic 2013-03-09 A unified Bayesian approach to the state-of-the-art filtering, smoothing, and parameter estimation algorithms for non-linear state space models.
Essentials of Nonlinear Circuit Dynamics with MATLAB & Laboratory Experiments Arturo Biacino 2017-04-07 This book deals with nonlinear dynamics in continuous-time systems and the mathematical genesis of the concept is related to a course on complex adaptive systems that has been held at the University of Catania since 2005. The efforts are devoted in order to enable nonlinear electronic circuits design. Nonlinear step-by-step methods show the essential concepts of complex systems by using the Vares diagrams and accompanying MATLAB(R) exercises to reinforce new information. Special attention has been devoted to chaotic dynamics and the control of chaos. The aim of the book is to give readers a comprehensive view of the main concepts of nonlinear dynamics to help them better understand complex systems and their control through the use of electronic devices.
Convex Optimization & Euclidean Distance Geometry Ion. J. Demacios 2005 The study of Euclidean distance matrices (EDMs) fundamentally asks what can be known geometrically about points in Euclidean space. Each point may represent simply location, abstractly, any entity expressible as a vector in Euclidean space. The aim of this book is to present a comprehensive view of the main concepts of nonlinear dynamics to help them better understand complex systems and their control through the use of electronic devices.
Core Concepts in Tax Policy, Women and the Law: Beyond the Parable of the One-Commodity World (WorldFish) Ann Mumford 2010-11-04 Tax policy frequently targets the choices that women face in many aspects of their lives. Decisions on November 8, 2022 by guest
Modeling and Control of Dynamic Systems Using Gaussian Process Models

There are 18 chapters that illustrate the breadth of this field. The chapters use a variety of researchers but also clinicians, economists and policy analysts. The research is also often very applied, focusing on a specific question driven by a decision-maker and the practical guidance found in Business Intelligence Success Factors.

Business Intelligence Success Factors
Olivia Parr Rud 2009-06-02 Over the last few decades, the growth of Business Intelligence has enabled companies to streamline many processes and expand into new markets on an unprecedented scale. New BI technologies are also enabling mass collaboration and innovation. However, implementation of these BI solutions often gives rise to new challenges. Business Intelligence Success Factors shows you how to turn these challenges into opportunities by providing you with proven guidance from an experienced speaker at the Business Intelligence Success World Congress 2009 in Las Vegas. This book presents a practical blueprint for uncovering problem-free business intelligence.

The current business landscape as well as the latest scientific research: today’s business realities and how and why they can lead to chaos. New scientific models for viewing Business Intelligence.

Social Systems Engineering: The Design of Complexity
Alejandro D. Domínguez-García 2017-12-28 Uniquely reflects an engineering view to social systems in a wide variety of contexts: Social Systems Engineering: The Design of Complexity provides modelling examples to explore the design aspect of social systems. Various applications are explored in a variety of areas, such as urban systems, health care systems, socio-economic systems, and environmental systems. It covers important topics such as organizational design, modelling and intervention in socio-economic systems and/or community-based modelling, application of systems engineering tools to social systems, applications of computational biology, and organizational management of complexity, among others. The book outlines an engineering view to social systems (as opposed to a ‘scientific’ view) that stresses the importance of systems intervention design for social complex systems. Short Writing Divides works where design, red-design, and re-design of social systems constitute the main and where joint considerations of both technical and social perspectives are deemed important in solving social problems. Features an array of cases that illustrate the application of social systems engineering in diverse domains Social Systems Engineering: The Design of Complexity is an extended and updated version of a textbook and graduate text in engineering and social sciences—specifically, economics, political science, anthropology, and management—written with an interest in finding systemic ways to address emergent conditions.

Marketing for Social Systems
David G. Luenberger 1979

Introduction to Dynamic Systems
David G. Luenberger 1979-05-26 Difference and differential equations; Linear algebra; Linear state equations; Linear system with constant coefficients; Linear systems; Markov chains; Control; Analysis of nonlinear systems: Some important dynamic systems: Optimal control.

Financial Engineering
David G. Luenberger 2008-04-17 This book introduces students in Engineering, Business, Economics, and Statistics to the design and marketing of financial instruments. The book is written for upper division undergraduate students as well as Masters level engineering, economics and statistics programs, as well as the programs in Financial Engineering. The book covers numerous exercises in addition to providing a variety of references to relevant literature on various topics.

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The problems are solved before the models are presented, and students are introduced to the technique of linear programming. The book presents to readers the problems and solutions they need to solve in order to be able to effectively model and solve real-life models. The book is written for upper division undergraduate students as well as Masters level engineering, economics and statistics programs, as well as the programs in Financial Engineering. The book covers numerous exercises in addition to providing a variety of references to relevant literature on various topics.

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The research results presented are applied in real-life case studies drawn from successful applications including a gas-liquid separator control; urban-traffic signal modelling and reconstruction; and prediction of atmospheric vane movement. A MATLAB tool, for identification and simulation of dynamical GP models is provided, and the book includes a companion website to the text.
Feedback Systems
Karl Johan Åström 2021-02-02 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 concrete 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 Hurwitz-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.

Data Assimilation
Kody Law 2015-09-06 This book provides a systematic treatment of the mathematical underpinnings of work in data assimilation, covering both theoretical and computational approaches. Specifically the authors develop a unified mathematical framework in which a Bayesian formulation of the problem provides the bedrock for the derivation, development and analysis of algorithms; the many examples used in the text, together with the algorithms which are introduced and discussed, are all illustrated by the MATLAB software detailed in the book and made freely available online. The book is organized into nine chapters: the first contains a brief introduction to the mathematical tools around which the material is organized; the next four are concerned with discrete-time dynamical systems and discrete-time data; the last four are concerned with continuous-time dynamical systems and continuous-time data and are organized analogously to the corresponding discrete-time chapters. This book is aimed at mathematical researchers interested in a systematic development of this interdisciplinary field, and at researchers from the geosciences, and a variety of other scientific fields, who use tools from data assimilation to combine data with time-dependent models. The numerous examples and illustrations make understanding of the theoretical underpinnings of data assimilation accessible. Furthermore, the examples, exercises and MATLAB software, make all necessary tools available to the reader. Providing a unified view of the field, this book is an excellent teaching resource for graduate students and researchers alike.

Chaos: An Introduction to Dynamical Systems
Robert Devaney 2003-09-28 A First Course in Chaotic Dynamical Systems: Theory and Experiment is the first book to introduce modern topics in dynamical systems at the undergraduate level. Accessible to readers with only a background in calculus, this book integrates both theory and computer experiments into its coverage of contemporary ideas in dynamical systems. It is designed as a gradual introduction to the basic mathematical ideas behind such topics as chaos, fractals, Newton's method, symbolic dynamics, the Julia set, and the Mandelbrot set, and includes biographies of some of the leading researchers in the field of dynamical systems. Mathematical and computer experiments are integrated throughout the text to help illustrate the meaning of the theorems presented. Chaotic Dynamical Systems Software, Labs 1-6 is a supplementary laboratory software package, available separately, that allows a more intuitive understanding of the mathematics behind dynamical systems theory. Combined with A First Course in Chaotic Dynamical Systems, it leads to a rich understanding of this emerging field.

Applied Stochastic Differential Equations
Simo Särkkä 2019-05-02 With this hands-on introduction readers will learn what SDEs are all about and how they should use them in practice.

Information Science
David G. Luenberger 2012-01-12 From cell phones to Web portals, advances in information and communications technology have thrust society into an information age that is far-reaching, fast-moving, increasingly complex, and yet essential to modern life. Now, renowned scholar and author David Luenberger has produced Information Science, a text that distills and explains the most important concepts and insights at the core of this ongoing revolution. The book represents the material used in a widely acclaimed course offered at Stanford University. Drawing concepts from such of the constituent subfields that collectively comprise information science, Luenberger builds his book around the five "Es" of information: Entropy, Economics, Encryption, Extraction, and Emission. Each area directly impacts modern information products, services, and technology—everything from word processors to digital cash, database systems to decision making, marketing strategies to spread spectrum communication. To study these principles is to learn how English text, music, and pictures can be compressed, how it is possible to construct a digital signature that cannot simply be copied, how beautiful photographs can be sent from distant planets with a tiny battery, how communication networks expand, and how producers of information products can make a profit under difficult market conditions. The book contains vivid examples, illustrations, exercises, and points of historic interest, all of which bring to life the analytic methods presented. Presents a unified approach to the field of information science.

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