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Dynamic Optimization of Path-Constrained Switched Systems Adaptive Discretization Methods for the Efficient Solution of Dynamic Optimization Problems Dynamic Optimization, Second Edition Approximation and Solution Schemes for Stochastic Dynamic Optimization Problems Evolutionary Optimization in Dynamic Environments Adaptive Multiscale Methods for the Solution of Dynamic Optimization Problems Optimization in Engineering Dynamic Optimization and Economic Applications Elements of Dynamic Optimization LQ Dynamic Optimization and Differential Games Dynamic Optimization and Mathematical Economics Nature-inspired Methods for Stochastic, Robust and Dynamic Optimization Optimization of Dynamic Systems LQ Dynamic Optimization and Differential Games Dynamic Optimization in Environmental Economics Evolutionary Computation for Dynamic Optimization Problems Anticipatory Optimization for Dynamic Decision Making Metaheuristics for Dynamic Optimization Frontiers in Global Optimization Solution Formulas for Dynamic Linear Optimization Problems Optimizations and Programming Dynamic Optimization Introductory Optimization Dynamics Optimization, Simulation, and Control Research Methods in Biomechanics, 2E Dynamic Economics Necessary Conditions in Dynamic Optimization Applied Dynamic Programming Mathematical Optimization and Economic Theory Nonlinear Model Predictive Control Frontiers in Global Optimization European Symposium on Computer Aided Process Engineering - 10 Introduction to Dynamic Programming 16th European Symposium on Computer Aided Process Engineering and 9th International Symposium on Process Systems Engineering Optimization in Food Engineering Methods of Dynamic and Nonsmooth Optimization Modeling and Optimization of Parallel and Distributed Embedded Systems Foundations of Dynamic Economic Analysis Modeling and Simulation of Energy Systems Durable-Strategies Dynamic Games

Dynamic Optimization of Path-Constrained Switched Systems

2023-03-11

this book provides a series of systematic theoretical results and numerical solution algorithms for dynamic optimization problems of switched systems within infinite dimensional inequality path constraints dynamic optimization of path constrained switched systems is a challenging task due to the complexity from seeking the best combinatorial optimization among the system input switch times and switching sequences meanwhile to ensure safety and guarantee product quality path constraints are required to be rigorously satisfied i e at an infinite number of time points within a finite number of iterations several novel methodologies are presented by using dynamic optimization and semi infinite programming techniques the core advantages of our new approaches lie in two folds i the system input switch times and the switching sequence can be optimized simultaneously ii the proposed algorithms terminate within finite iterations while coming with a certification of feasibility for the path constraints in this book first we provide brief surveys on dynamic optimization of path constrained systems and switched systems for switched systems with a fixed switching sequence we propose a bi level algorithm in which the input is optimized at the inner level and the switch times are updated at the outer level by using the gradient information of the optimal value function calculated at the optimal input we then propose an efficient single level algorithm by optimizing the input and switch times simultaneously which greatly reduces the number of nonlinear programs and the computational burden for switched systems with free switching sequences we propose a solution framework for dynamic optimization of path constrained switched systems by employing the variant 2 of generalized benders decomposition technique in this framework we adopt two different system formulations in the primal and master problem construction and explicitly characterize the switching sequences by introducing a binary variable finally we propose a multi objective dynamic optimization algorithm for locating approximated local pareto solutions and quantitatively analyze the approximation optimality of the obtained solutions this book provides a unified framework of dynamic optimization of path constrained switched systems it can therefore serve as a useful book for researchers and graduate students who are interested in knowing the state of the art of dynamic optimization of switched systems as well as recent advances in path constrained optimization problems it is a useful source of up to date optimization methods and algorithms for researchers who study switched systems and graduate students of control theory and control engineering in addition it is also a useful source for engineers who work in the control and optimization fields such as robotics chemical engineering and industrial processes

Adaptive Discretization Methods for the Efficient Solution of Dynamic Optimization Problems

2005

since its initial publication this text has defined courses in dynamic optimization taught to economics and management science students the two part treatment covers the calculus of variations and optimal control 1998 edition

Dynamic Optimization, Second Edition

2013-04-17

evolutionary algorithms eas have grown into a mature field of research in optimization and have proven to be effective and robust problem solvers for a broad range of static real world optimization problems yet since they are based on the principles of natural evolution and since natural evolution is a dynamic process in a changing environment eas are also well suited to dynamic optimization problems evolutionary optimization in dynamic environments is the first comprehensive work on the application of eas to dynamic optimization problems it provides an extensive survey on research in the area and shows how eas can be successfully used to continuously and efficiently adapt a solution to a changing environment find a good trade off between solution quality and adaptation cost find robust solutions whose quality is insensitive to changes in the environment find flexible solutions which are not only good but that can be easily adapted when necessary all four aspects are treated in this book providing a holistic view on the challenges and opportunities when applying eas to dynamic

optimization problems the comprehensive and up to date coverage of the subject together with details of latest original research makes evolutionary optimization in dynamic environments an invaluable resource for researchers and professionals who are dealing with dynamic and stochastic optimization problems and who are interested in applying local search heuristics such as evolutionary algorithms

Approximation and Solution Schemes for Stochastic Dynamic Optimization Problems

1998

this textbook covers the fundamentals of optimization including linear mixed integer linear nonlinear and dynamic optimization techniques with a clear engineering focus it carefully describes classical optimization models and algorithms using an engineering problem solving perspective and emphasizes modeling issues using many real world examples related to a variety of application areas providing an appropriate blend of practical applications and optimization theory makes the text useful to both practitioners and students and gives the reader a good sense of the power of optimization and the potential difficulties in applying optimization to modeling real world systems the book is intended for undergraduate and graduate level teaching in industrial engineering and other engineering specialties it is also of use to industry practitioners due to the inclusion of real world applications opening the door to advanced courses on both modeling and algorithm development within the industrial engineering and operations research fields

Evolutionary Optimization in Dynamic Environments

2012-12-06

designed to be used with chiang s fundamental methods of mathematical economics or independently at advanced undergraduate or graduate level this text presents an in depth exploration of dynamic optimization in economics

Adaptive Multiscale Methods for the Solution of Dynamic Optimization Problems

2002

game theory is the theory of social situations and the majority of research into the topic focuses on how groups of people interact by developing formulas and algorithms to identify optimal strategies and to predict the outcome of interactions only fifty years old it has already revolutionized economics and finance and is spreading rapidly to a wide variety of fields lq dynamic optimization and differential games is an assessment of the state of the art in its field and the first modern book on linear quadratic game theory one of the most commonly used tools for modelling and analysing strategic decision making problems in economics and management linear quadratic dynamic models have a long tradition in economics operations research and control engineering and the author begins by describing the one decision maker lq dynamic optimization problem before introducing lq differential games covers cooperative and non cooperative scenarios and treats the standard information structures open loop and feedback includes real life economic examples to illustrate theoretical concepts and results presents problem formulations and sound mathematical problem analysis includes exercises and solutions enabling use for self study or as a course text supported by a website featuring solutions to exercises further examples and computer code for numerical examples lq dynamic optimization and differential games offers a comprehensive introduction to the theory and practice of this extensively used class of economic models and will appeal to applied mathematicians and econometricians as well as researchers and senior undergraduate graduate students in economics mathematics engineering and management science

Optimization in Engineering

2017-06-24

as an outgrowth of the advancement in modern control theory during the past 20 years dynamic modeling and analysis of economic systems has become an important subject in the study of economic theory recent developments in dynamic utility economic planning and profit optimization for example have been greatly influenced by results in optimal control stabilization estimation optimization under conflicts multi criteria optimization control of large scale systems etc the great success that has been achieved so far in utilizing modern control theory in economic systems should be attributed to the effort of control theorists as well as economists collaboration between the two groups of researchers has proven to be most successful in many instances nevertheless the gap between them has existed for some time whereas a control theorist frequently sets up a mathematically feasible model to obtain results that permit economic interpretations an economist is concerned more with the fidelity of the model in representing a real world problem and results that are obtained through possibly less mathematical analysis are due largely to economic insight the papers appearing in this volume are divided into three parts in part i there are five papers on the application of control theory to economic planning part ii contains five papers on exploration exploitation and pricing of extractive natural resources finally in part iii some recent advances in large scale systems and decentralized control appear

Dynamic Optimization and Economic Applications

1979

nature inspired algorithms have a great popularity in the current scientific community being the focused scope of many research contributions in the literature year by year the rationale behind the acquired momentum by this broad family of methods lies on their outstanding performance evinced in hundreds of research fields and problem instances this book gravitates on the development of nature inspired methods and their application to stochastic dynamic and robust optimization topics covered by this book include the design and development of evolutionary algorithms bio inspired metaheuristics or memetic methods with empirical innovative findings when used in different subfields of mathematical optimization such as stochastic dynamic multimodal and robust optimization as well as noisy optimization and dynamic and constraint satisfaction problems

Elements of Dynamic Optimization

1992

this textbook deals with optimization of dynamic systems the motivation for undertaking this task is as follows there is an ever increasing need to produce more efficient accurate and lightweight mechanical and electromechanical devices thus the typical graduating b s and m s candidate is required to have some familiarity with techniques for improving the performance of dynamic systems unfortunately existing texts dealing with system improvement via optimization remain inaccessible to many of these students and practicing engineers it is our goal to alleviate this difficulty by presenting to seniors and beginning graduate students practical efficient techniques for solving engineering system optimization problems the text has been used in optimal control and dynamic system optimization courses at the university of delaware the university of washington and ohio university over the past four years the text covers the following material in a straightforward detailed manner static optimization the problem of optimizing a function that depends on static variables i e parameters is considered problems with equality and inequality constraints are addressed numerical methods static optimization numerical algorithms for the solution of static optimization problems are presented here the methods presented can accommodate both the unconstrained and constrained static optimization problems calculus of variation the necessary and sufficient conditions for the extremum of functionals are presented both the fixed final time and free final time problems are considered

LQ Dynamic Optimization and Differential Games

2005-11-01

game theory is the theory of social situations and the majority of research into the topic focuses on how groups of people interact by developing formulas and algorithms to identify optimal strategies and to predict the outcome of interactions only fifty years old it has already revolutionized economics and finance and is spreading rapidly to a wide variety of fields lq dynamic optimization and differential games is an assessment of the state

of the art in its field and the first modern book on linear quadratic game theory one of the most commonly used tools for modelling and analysing strategic decision making problems in economics and management linear quadratic dynamic models have a long tradition in economics operations research and control engineering and the author begins by describing the one decision maker lq dynamic optimization problem before introducing lq differential games covers cooperative and non cooperative scenarios and treats the standard information structures open loop and feedback includes real life economic examples to illustrate theoretical concepts and results presents problem formulations and sound mathematical problem analysis includes exercises and solutions enabling use for self study or as a course text supported by a website featuring solutions to exercises further examples and computer code for numerical examples lq dynamic optimization and differential games offers a comprehensive introduction to the theory and practice of this extensively used class of economic models and will appeal to applied mathematicians and econometricians as well as researchers and senior undergraduate graduate students in economics mathematics engineering and management science

Dynamic Optimization and Mathematical Economics

2013-03-09

the book presents new developments in the dynamic modeling and optimization methods in environmental economics and provides a huge range of applications dealing with the economics of natural resources the impacts of climate change and of environmental pollution and respective policy measures the interrelationship between economic activities and environmental quality the development of cleaner technologies the switch from fossil to renewable resources and the proper use of policy instruments play an important role along the path towards a sustainable future biological physical and economic processes are naturally involved in the subject and postulate the main modelling simulation and decision making tools the methods of dynamic optimization and dynamic games

Nature-inspired Methods for Stochastic, Robust and Dynamic Optimization

2018-07-18

this book provides a compilation on the state of the art and recent advances of evolutionary computation for dynamic optimization problems the motivation for this book arises from the fact that many real world optimization problems and engineering systems are subject to dynamic environments where changes occur over time key issues for addressing dynamic optimization problems in evolutionary computation including fundamentals algorithm design theoretical analysis and real world applications are presented evolutionary computation for dynamic optimization problems is a valuable reference to scientists researchers professionals and students in the field of engineering and science particularly in the areas of computational intelligence nature and bio inspired computing and evolutionary computation

Optimization of Dynamic Systems

2013-03-09

the availability of today s online information systems rapidly increases the relevance of dynamic decision making within a large number of operational contexts whenever a sequence of interdependent decisions occurs making a single decision raises the need for anticipation of its future impact on the entire decision process anticipatory support is needed for a broad variety of dynamic and stochastic decision problems from different operational contexts such as finance energy management manufacturing and transportation example problems include asset allocation feed in of electricity produced by wind power as well as scheduling and routing all these problems entail a sequence of decisions contributing to an overall goal and taking place in the course of a certain period of time each of the decisions is derived by solution of an optimization problem as a consequence a stochastic and dynamic decision problem resolves into a series of optimization problems to be formulated and solved by anticipation of the remaining decision process however actually solving a dynamic decision problem by means of approximate dynamic programming still is a major scientific challenge most of the work done so far

is devoted to problems allowing for formulation of the underlying optimization problems as linear programs problem domains like scheduling and routing where linear programming typically does not produce a significant benefit for problem solving have not been considered so far therefore the industry demand for dynamic scheduling and routing is still predominantly satisfied by purely heuristic approaches to anticipatory decision making although this may work well for certain dynamic decision problems these approaches lack transferability of findings to other related problems this book has serves two major purposes it provides a comprehensive and unique view of anticipatory optimization for dynamic decision making it fully integrates markov decision processes dynamic programming data mining and optimization and introduces a new perspective on approximate dynamic programming moreover the book identifies different degrees of anticipation enabling an assessment of specific approaches to dynamic decision making it shows for the first time how to successfully solve a dynamic vehicle routing problem by approximate dynamic programming it elaborates on every building block required for this kind of approach to dynamic vehicle routing thereby the book has a pioneering character and is intended to provide a footing for the dynamic vehicle routing community

LQ Dynamic Optimization and Differential Games

2005-06-17

this book is an updated effort in summarizing the trending topics and new hot research lines in solving dynamic problems using metaheuristics an analysis of the present state in solving complex problems quickly draws a clear picture problems that change in time having noise and uncertainties in their definition are becoming very important the tools to face these problems are still to be built since existing techniques are either slow or inefficient in tracking the many global optima that those problems are presenting to the solver technique thus this book is devoted to include several of the most important advances in solving dynamic problems metaheuristics are the more popular tools to this end and then we can find in the book how to best use genetic algorithms particle swarm ant colonies immune systems variable neighborhood search and many other bioinspired techniques also neural network solutions are considered in this book both theory and practice have been addressed in the chapters of the book mathematical background and methodological tools in solving this new class of problems and applications are included from the applications point of view not just academic benchmarks are dealt with but also real world applications in logistics and bioinformatics are discussed here the book then covers theory and practice as well as discrete versus continuous dynamic optimization in the aim of creating a fresh and comprehensive volume this book is targeted to either beginners and experienced practitioners in dynamic optimization since we took care of devising the chapters in a way that a wide audience could profit from its contents we hope to offer a single source for up to date information in dynamic optimization an inspiring and attractive new research domain that appeared in these last years and is here to stay

Dynamic Optimization in Environmental Economics

2014-07-08

global optimization has emerged as one of the most exciting new areas of mathematical programming global optimization has received a wide attraction from many fields in the past few years due to the success of new algorithms for addressing previously intractable problems from diverse areas such as computational chemistry and biology biomedicine structural optimization computer sciences operations research economics and engineering design and control this book contains refereed invited papers submitted at the 4th international conference on frontiers in global optimization held at santorini greece during june 8 12 2003 santorini is one of the few sites of greece with wild beauty created by the explosion of a volcano which is in the middle of the gulf of the island the mystic landscape with its numerous mult extrema was an inspiring location particularly for researchers working on global optimization the three previous conferences on recent advances in global optimization state of the art in global optimization and optimization in computational chemistry and molecular biology local and global approaches took place at princeton university in 1991 1995 and 1999 respectively the papers in this volume focus on deterministic methods for global optimization stochastic methods for global optimization distributed computing methods in global optimization and applications of global optimization in several branches of applied science and engineering computer science computational chemistry structural biology and bioinformatics

Evolutionary Computation for Dynamic Optimization Problems

2013-11-18

this book is a general presentation of complex systems examined from the point of view of management there is no standard formula to govern such systems nor to effectively understand and respond to them the interdisciplinary theory of self organization is teeming with examples of living systems that can reorganize at a higher level of complexity when confronted with an external challenge of a certain magnitude modern businesses considered as complex systems ideally know how to flexibly and resiliently adapt to their environment and also how to prepare for change via self organization understanding sources of potential crisis is essential for leaders though not all crises are necessarily bad news as creative firms know how to respond to challenges through innovation new products and markets organizational learning for collective intelligence and more

Anticipatory Optimization for Dynamic Decision Making

2011-06-23

this book explores discrete time dynamic optimization and provides a detailed introduction to both deterministic and stochastic models covering problems with finite and infinite horizon as well as markov renewal programs bayesian control models and partially observable processes the book focuses on the precise modelling of applications in a variety of areas including operations research computer science mathematics statistics engineering economics and finance dynamic optimization is a carefully presented textbook which starts with discrete time deterministic dynamic optimization problems providing readers with the tools for sequential decision making before proceeding to the more complicated stochastic models the authors present complete and simple proofs and illustrate the main results with numerous examples and exercises without solutions with relevant material covered in four appendices this book is completely self contained

Metaheuristics for Dynamic Optimization

2012-08-11

optimal control theory has been increasingly used in economic and management science in the last fifteen years or so it is now commonplace even at textbook level it has been applied to a great many areas of economics and management science such as optimal growth optimal population pollution control natural resources bioeconomics education international trade monopoly oligopoly and duopoly urban and regional economics arms race control business finance inventory planning marketing maintenance and replacement policy and many others it is a powerful tool of dynamic optimization there is no doubt social sciences students should be familiar with this tool if not for their own research at least for reading the literature these lecture notes attempt to provide a plain exposition of optimal control theory with a number of economic examples and applications designed mainly to illustrate the various techniques and point out the wide range of possible applications rather than to treat exhaustively any area of economic theory or policy chapters 2 3 and 4 are devoted to the calculus of variations chapter 5 develops optimal control theory from the variational approach chapter 6 deals with the problems of constrained state and control variables chapter 7 with linear control models and chapter 8 with stabilization models discrete systems are discussed in chapter 9 and sensitivity analysis in chapter 10 chapter 11 presents a wide range of economics and management science applications

Frontiers in Global Optimization

2013-12-01

optimization simulation and control play an increasingly important role in science and industry because of their numerous applications in various disciplines research in these areas is accelerating at a rapid pace this volume brings together the latest developments in these areas of research as well as presents applications of these results to a wide range of real world problems the book is composed of invited contributions by experts from around the world who work to develop and apply new optimization simulation and control techniques either at a

theoretical level or in practice some key topics presented include equilibrium problems multi objective optimization variational inequalities stochastic processes numerical analysis optimization in signal processing and various other interdisciplinary applications this volume can serve as a useful resource for researchers practitioners and advanced graduate students of mathematics and engineering working in research areas where results in optimization simulation and control can be applied

Solution Formulas for Dynamic Linear Optimization Problems

1979

detailing up to date research technologies and approaches research methods in biomechanics second edition assists both beginning and experienced researchers in developing methods for analyzing and quantifying human movement

Optimizations and Programming

2021-04-27

this work provides a unified and simple treatment of dynamic economics using dynamic optimization as the main theme and the method of lagrange multipliers to solve dynamic economic problems the author presents the optimization framework for dynamic economics in order that readers can understand the approach and use it as they see fit instead of using dynamic programming the author chooses instead to use the method of lagrange multipliers in the analysis of dynamic optimization because it is easier and more efficient than dynamic programming and allows readers to understand the substance of dynamic economics better the author treats a number of topics in economics including economic growth macroeconomics microeconomics finance and dynamic games the book also teaches by examples using concepts to solve simple problems it then moves to general propositions

Dynamic Optimization

2017-01-12

this monograph derives necessary conditions of optimality for a general control problem formulated in terms of a differential inclusion these conditions constitute a new state of the art subsuming unifying and substantially extending the results in the literature the euler weierstrass and transversality conditions are expressed in their sharpest known forms no assumptions of boundedness or convexity are made no constraint qualifications imposed and only weak pseudo lipschitz behavior is postulated on the underlying multifunction the conditions also incorporate a stratified feature of a novel nature in which both the hypotheses and the conclusion are formulated relative to a given radius function when specialized to the calculus of variations the results yield necessary conditions and regularity theorems that go significantly beyond the previous standard they also apply to parametrized control systems giving rise to new and stronger maximum principles of pontryagin type the final chapter is devoted to a different issue that of the hamiltonian necessary condition it is obtained here for the first time in the case of nonconvex values and in the absence of any constraint qualification this has been a longstanding open question in the subject apart from the final chapter the treatment is self contained and calls upon only standard results in functional and nonsmooth analysis

Introductory Optimization Dynamics

2013-11-11

this comprehensive study of dynamic programming applied to numerical solution of optimization problems it will interest aerodynamic control and industrial engineers numerical analysts and computer specialists applied mathematicians economists and operations and systems analysts originally published in 1962 the princeton legacy library uses the latest print on demand technology to again make available previously out of print books from the distinguished backlist of princeton university press these editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions the goal of the princeton

legacy library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by princeton university press since its founding in 1905

Optimization, Simulation, and Control

2012-11-28

static optimization application of static optimization dynamic optimization applications of dynamic optimization

Research Methods in Biomechanics, 2E

2013-09-25

during the past decade model predictive control mpc also referred to as receding horizon control or moving horizon control has become the preferred control strategy for quite a number of industrial processes there have been many significant advances in this area over the past years one of the most important ones being its extension to nonlinear systems this book gives an up to date assessment of the current state of the art in the new field of nonlinear model predictive control nmppc the main topic areas that appear to be of central importance for nmppc are covered namely receding horizon control theory modeling for nmppc computational aspects of on line optimization and application issues the book consists of selected papers presented at the international symposium on nonlinear model predictive control assessment and future directions which took place from june 3 to 5 1998 in ascona switzerland the book is geared towards researchers and practitioners in the area of control engineering and control theory it is also suited for postgraduate students as the book contains several overview articles that give a tutorial introduction into the various aspects of nonlinear model predictive control including systems theory computations modeling and applications

Dynamic Economics

1997-02-13

global optimization has emerged as one of the most exciting new areas of mathematical programming global optimization has received a wide attraction from many fields in the past few years due to the success of new algorithms for addressing previously intractable problems from diverse areas such as computational chemistry and biology biomedicine structural optimization computer sciences operations research economics and engineering design and control the chapters in this volume focus on recent deterministic methods and stochastic methods for global optimization distributed computing methods in global optimization and applications of global optimization in several branches of applied science and engineering computer science computational chemistry structural biology and bio informatics

Necessary Conditions in Dynamic Optimization

2005

this book includes papers presented at escape 10 the 10th european symposium on computer aided process engineering held in florence italy 7 10th may 2000 the scientific program reflected two complementary strategic objectives of the computer aided process engineering cape working party one checked the status of historically consolidated topics by means of their industrial application and their emerging issues while the other was addressed to opening new windows to the cape audience by inviting adjacent working parties to co operate in the creation of the technical program the former cape strategic objective was covered by the topics numerical methods process design and synthesis dynamics control process modeling simulation and optimization the latter cape strategic objective derived from the european federation of chemical engineering efce promotion of scientific activities which autonomously and transversely work across the working parties terms of references these activities enhance the exchange of the know how and knowledge acquired by different working parties in homologous fields they also aim to discover complementary facets useful to the dissemination of tools and of novel procedures as a consequence the working parties environmental protection loss prevention and safety promotion and multiphase fluid flow were invited to assist in the organization of sessions in the area of a

process integrated approach for environmental benefit loss prevention and safety computational fluid dynamics a total of 473 abstracts from all over the world were evaluated by the international scientific committee out of them 197 have been finally selected for the presentation and reported into this book their authors come from thirty different countries the selection of the papers was carried out by twenty eight international reviewers these proceedings will be a major reference document to the scientific and industrial community and will contribute to the progress in computer aided process engineering

Applied Dynamic Programming

2015-12-08

some simple examples functional equations basic theory one dimensional dynamic programming analytic solutions one dimensional dynamic programming computational solutions multidimensional problems reduction of state dimensionality and approximations stochastic processes and dynamic programming dynamic programming and the calculus of variations applications of dynamic programming set convexity and n dimensional geometry

Mathematical Optimization and Economic Theory

1971

this proceedings book brings together the leading innovations and achievements by leading professionals it acts as a forum for engineers scientists researchers managers and students from academia and industry to present and discuss progress being made in research and application of computer aided process engineering

Nonlinear Model Predictive Control

2000-03-01

while mathematically sophisticated methods can be used to better understand and improve processes the nonlinear nature of food processing models can make their dynamic optimization a daunting task with contributions from a virtual who s who in the food processing industry optimization in food engineering evaluates the potential uses and limitati

Frontiers in Global Optimization

2004

presents the elements of a unified approach to optimization based on nonsmooth analysis a term introduced in the 1970 s by the author who is a pioneer in the field based on a series of lectures given at a conference at emory university in 1986 this volume presents its subjects in a self contained and accessible manner the topics treated here have been in an active state of development focuses mainly on deterministic optimal control the calculus of variations and mathematical programming in addition it features a tutorial in nonsmooth analysis and geometry and demonstrates that the method of value function analysis via proximal normals is a powerful tool in the study of necessary conditions sufficient conditions controllability and sensitivity analysis the distinction between inductive and deductive methods the use of hamiltonians the verification technique and penalization are also emphasized

European Symposium on Computer Aided Process Engineering - 10

2000-05-10

this book introduces the state of the art in research in parallel and distributed embedded systems which have been enabled by developments in silicon technology micro electro mechanical systems mems wireless communications computer networking and digital electronics these systems have diverse applications in domains including military and defense medical automotive and unmanned autonomous vehicles the emphasis

of the book is on the modeling and optimization of emerging parallel and distributed embedded systems in relation to the three key design metrics of performance power and dependability key features includes an embedded wireless sensor networks case study to help illustrate the modeling and optimization of distributed embedded systems provides an analysis of multi core many core based embedded systems to explain the modeling and optimization of parallel embedded systems features an application metrics estimation model markov modeling for fault tolerance and analysis and queueing theoretic modeling for performance evaluation discusses optimization approaches for distributed wireless sensor networks high performance and energy efficient techniques at the architecture middleware and software levels for parallel multicore based embedded systems and dynamic optimization methodologies highlights research challenges and future research directions the book is primarily aimed at researchers in embedded systems however it will also serve as an invaluable reference to senior undergraduate and graduate students with an interest in embedded systems research

Introduction to Dynamic Programming

1981

foundations of dynamic economic analysis presents a modern and thorough exposition of the fundamental mathematical formalism used to study optimal control theory i e continuous time dynamic economic processes and to interpret dynamic economic behavior the style of presentation with its continual emphasis on the economic interpretation of mathematics and models distinguishes it from several other excellent texts on the subject this approach is aided dramatically by introducing the dynamic envelope theorem and the method of comparative dynamics early in the exposition accordingly motivated and economically revealing proofs of the transversality conditions come about by use of the dynamic envelope theorem furthermore such sequencing of the material naturally leads to the development of the primal dual method of comparative dynamics and dynamic duality theory two modern approaches used to tease out the empirical content of optimal control models the stylistic approach ultimately draws attention to the empirical richness of optimal control theory a feature missing in virtually all other textbooks of this type

16th European Symposium on Computer Aided Process Engineering and 9th International Symposium on Process Systems Engineering

2006

energy systems engineering is one of the most exciting and fastest growing fields in engineering modeling and simulation plays a key role in energy systems engineering because it is the primary basis on which energy system design control optimization and analysis are based this book contains a specially curated collection of recent research articles on the modeling and simulation of energy systems written by top experts around the world from universities and research labs such as massachusetts institute of technology yale university norwegian university of science and technology national energy technology laboratory of the us department of energy university of technology sydney mcmaster university queens university purdue university the university of connecticut technical university of denmark the university of toronto technische universität berlin texas a m the university of pennsylvania and many more the key research themes covered include energy systems design control systems flexible operations operational strategies and systems analysis the addressed areas of application include electric power generation refrigeration cycles natural gas liquefaction shale gas treatment concentrated solar power waste to energy systems micro gas turbines carbon dioxide capture systems energy storage petroleum refinery unit operations brayton cycles to name but a few

Optimization in Food Engineering

2008-12-09

durable strategies that have prolonged effects are prevalent in real world situations revenue generating investments toxic waste disposal long lived goods regulatory measures coalition agreements diffusion of knowledge advertisement and investments to accumulate physical capital are concrete and common examples

of durable strategies this book provides an augmentation of dynamic game theory and advances a new game paradigm with durable strategies in decision making schemes it covers theories solution techniques and the applications of a general class of dynamic games with multiple durable strategies non cooperative equilibria and cooperative solutions are derived along with advanced topics including random termination asynchronous game horizons and stochastic analysis the techniques presented here will enable readers to solve numerous practical dynamic interactive problems with durable strategies this book not only expands the scope of applied dynamic game theory but also provides a solid foundation for further theoretical and technical advancements as such it will appeal to scholars and students of quantitative economics game theory operations research and computational mathematics not too many new concepts have been introduced in dynamic games since their inception the introduction of the concept of durable strategies changes this trend and yields important contributions to environmental and business applications dušan m stipanović professor university of illinois at urbana champaign before this book the field simply did not realize that most of our strategies are durable and entail profound effects in the future putting them into the mathematical framework of dynamic games is a great innovative effort vladimir turetsky professor ort braude college durable strategies dynamic games is truly a world leading addition to the field of dynamic games it is a much needed publication to tackle increasingly crucial problems under the reality of durable strategies vladimir mazalov director of mathematical research russian academy of sciences president of the international society of dynamic games

Methods of Dynamic and Nonsmooth Optimization

1989-01-01

Modeling and Optimization of Parallel and Distributed Embedded Systems

2016-02-08

Foundations of Dynamic Economic Analysis

2005-01-17

Modeling and Simulation of Energy Systems

2019-11-06

Durable-Strategies Dynamic Games

2022-03-31

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