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Cybernetics And Systems '94 - Proceedings Of The 12th European Meeting On Cybernetics And Systems Research (In 2 Volumes)

1994-03-15

the papers in this volume reflect the most recent research findings in cybernetics and systems research they were selected from 298 draft final papers which were submitted to the conference by authors from more than 30 different countries from five continents

Dynamic Systems

2015-04-06

craig kluever s dynamic systems modeling simulation and control highlights essential topics such as analysis design and control of physical engineering systems often composed of interacting mechanical electrical and fluid subsystem components the major topics covered in this text include mathematical modeling system response analysis and an introduction to feedback control systems dynamic systems integrates an early introduction to numerical simulation using matlab s simulink for integrated systems simulink and matlab tutorials for both software programs will also be provided the author s text also has a strong emphasis on real world case studies

Small-signal stability, control and dynamic performance of power systems

2015-07-15

a thorough and exhaustive presentation of theoretical analysis and practical techniques for the small signal analysis and control of large modern electric power systems as well as an assessment of their stability and damping performance

History of the Political System of Europe, and Its Colonies

1829

this book aims to systematically review and design different intelligent control algorithms for the small signal stability assessment of hps with the growing consciousness of global warming and the fast depletion of natural power generation resources the existing power system is on the verge of transitions to a hybrid power system hps integrated with distributed energy resources the recent results and requirements for the developments of intelligent control algorithms have motivated the authors to introduce this book for extensively analyzing the performance of hps against unknown uncertain disturbances this book introduces fractional order resilient control methodologies for arresting small signal instability of hps the prospective investigation has been performed on the matlab platform this book is helpful for undergraduate postgraduate students and research scholars working in power system stability control applications and soft computing in particular

Application of Intelligent Control Algorithms to Study the Dynamics of Hybrid Power System

2022-03-30

this book presents a class of novel self learning optimal control schemes based on adaptive dynamic programming techniques which quantitatively obtain

the optimal control schemes of the systems it analyzes the properties identified by the programming methods including the convergence of the iterative value functions and the stability of the system under iterative control laws helping to guarantee the effectiveness of the methods developed when the system model is known self learning optimal control is designed on the basis of the system model when the system model is not known adaptive dynamic programming is implemented according to the system data effectively making the performance of the system converge to the optimum with various real world examples to complement and substantiate the mathematical analysis the book is a valuable guide for engineers researchers and students in control science and engineering

Self-Learning Optimal Control of Nonlinear Systems

2017-06-13

standalone off grid renewable energy systems supply electricity in places where there is no access to a standard electrical grid these systems may include photovoltaic generators wind turbines hydro turbines or any other renewable electrical generator usually this kind of system includes electricity storage commonly lead acid batteries but also other types of storage can be used in some cases a backup generator usually powered by fossil fuel diesel or gasoline is part of the hybrid system the modelling of the components the control of the system and the simulation of the performance of the whole system are necessary to evaluate the system technically and economically the optimization of the sizing and or the control is also an important task in this kind of system

Standalone Renewable Energy Systems

2020-06-23

mobile robotics offers comprehensive coverage of the essentials of the field suitable for both students and practitioners adapted from alonzo kelly s graduate and undergraduate courses the content of the book reflects current approaches to developing effective mobile robots professor kelly adapts principles and techniques from the fields of mathematics physics and numerical methods to present a consistent framework in a notation that facilitates learning and highlights relationships between topics this text was developed specifically to be accessible to senior level undergraduates in engineering and computer science and includes supporting exercises to reinforce the lessons of each section practitioners will value kelly s perspectives on practical applications of these principles complex subjects are reduced to implementable algorithms extracted from real systems wherever possible to enhance the real world relevance of the text

Mobile Robotics

2013-11-11

the prediction of behavior of complex systems analysis and modeling of its structure is a vitally important problem in engineering economy and generally in science today examples of such systems can be seen in the world around us including our bodies and of course in almost every scientific discipline including such exotic domains as the earth s atmosphere turbulent fluids economics exchange rate and stock markets population growth physics control of plasma information flow in social networks and its dynamics chemistry and complex networks to understand such complex dynamics which often exhibit strange behavior and to use it in research or industrial applications it is paramount to create its models for this purpose there exists a rich spectrum of methods from classical such as arma models or box jenkins method to modern ones like evolutionary computation neural networks fuzzy logic geometry deterministic chaos amongst others this proceedings book is a collection of accepted papers of the nostradamus conference that has been held in ostrava czech republic in june 2014 this book also includes outstanding keynote lectures by distinguished guest speakers rené lozi france ponnuthurai nagaratnam suganthan singapore and lars nolle germany the main aim of the conference was to create a periodical possibility for students

academics and researchers to exchange their ideas and novel research methods this conference establishes a forum for presentation and discussion of recent research trends in the area of applications of various predictive methods

Nostradamus 2014: Prediction, Modeling and Analysis of Complex Systems

2014-06-09

this textbook provides a mathematical introduction to linear systems with a focus on the continuous time models that arise in engineering applications such as electrical circuits and signal processing the book introduces linear systems via block diagrams and the theory of the laplace transform using basic complex analysis the book mainly covers linear systems with finite dimensional state spaces graphical methods such as nyquist plots and bode plots are presented alongside computational tools such as matlab multiple input multiple output mimo systems which arise in modern telecommunication devices are discussed in detail the book also introduces orthogonal polynomials with important examples in signal processing and wireless communication such as telatar s model for multiple antenna transmission one of the later chapters introduces infinite dimensional hilbert space as a state space with the canonical model of a linear system the final chapter covers modern applications to signal processing whittaker s sampling theorem for band limited functions and shannon s wavelet based on courses given for many years to upper undergraduate mathematics students the book provides a systematic mathematical account of linear systems theory and as such will also be useful for students and researchers in engineering the prerequisites are basic linear algebra and complex analysis

Linear Systems

2023-01-10

a guide to common control principles and how they are used to characterize a variety of physiological mechanisms the second edition of physiological control systems offers an updated and comprehensive resource that reviews the fundamental concepts of classical control theory and how engineering methodology can be applied to obtain a quantitative understanding of physiological systems the revised text also contains more advanced topics that feature applications to physiology of nonlinear dynamics parameter estimation methods and adaptive estimation and control the author a noted expert in the field includes a wealth of worked examples that illustrate key concepts and methodology and offers in depth analyses of selected physiological control models that highlight the topics presented the author discusses the most noteworthy developments in system identification optimal control and nonlinear dynamical analysis and targets recent bioengineering advances designed to be a practical resource the text includes guided experiments with simulation models using simulink matlab physiological control systems focuses on common control principles that can be used to characterize a broad variety of physiological mechanisms this revised resource offers new sections that explore identification of nonlinear and time varying systems and provide the background for understanding the link between continuous time and discrete time dynamic models presents helpful hands on experimentation with computer simulation models contains fully updated problems and exercises at the end of each chapter written for biomedical engineering students and biomedical scientists physiological control systems offers an updated edition of this key resource for understanding classical control theory and its application to physiological systems it also contains contemporary topics and methodologies that shape bioengineering research today

Physiological Control Systems

2018-06-06

this book begins with an overview of the rf control concepts and strategies it then introduces rf system models for optimizing the system parameters to satisfy beam requirements and for controller design in addition to systematically discussing the rf field control algorithms it presents typical architecture and algorithms for rf signal detection and actuation further the book addresses the analysis of the noise and nonlinearity in llrf systems to provide a

better understanding of the performance of the rf control system and to specify the performance requirements for different parts of the rf system today accelerators require increased rf stability and more complex operation scenarios such as providing beam for different beam lines with various parameters and as a result llrf systems are becoming more critical and complex this means that llrf system developers need have extensive knowledge of the entire accelerator complex and a wide range of other areas including rf and digital signal processing noise analysis accelerator physics and systems engineering providing a comprehensive introduction to the basic theories algorithms and technologies this book enables llrf system developers to systematically gain the knowledge required to specify design and implement llrf systems and integrate them with beam acceleration it is intended for graduate students professional engineers and researchers in accelerator physics

Low-Level Radio Frequency Systems

2022-03-02

this volume gathers the latest advances innovations and applications in the field of intelligent systems such as robots cyber physical and embedded systems as presented by leading international researchers and engineers at the international conference on intelligent technologies in robotics itr held in moscow russia on october 21 23 2019 it covers highly diverse topics including robotics design and machining control and dynamics bio inspired systems internet of thing big data rfid technology blockchain trusted software cyber physical systems cfs security development of cfs in manufacturing protection of information in cfs cybersecurity of cfs the contributions which were selected by means of a rigorous international peer review process highlight numerous exciting ideas that will spur novel research directions and foster multidisciplinary collaboration among different specialists demonstrating that intelligent systems will drive the technological and societal change in the coming decades

Advanced Technologies in Robotics and Intelligent Systems

2020-01-01

this book introduces the concepts at the basis of dynamic measuring systems vocabulary modelling calibration measurement data analysis uncertainty evaluation it also provides the mathematical foundations for signal processing stochastic processes and control theory necessary for the analysis of dynamic measurements concepts and practical approaches for dynamic calibration and dynamic measurement are introduced to the readership through concrete examples ranging from mechanical quantities and medical ultrasound to the internet of things iot

Dynamic Measuring Systems

2023-11-06

using a step by step approach this textbook provides a modern treatment of the fundamental concepts analytical techniques and software tools used to perform multi domain modeling system analysis and simulation linear control system design and implementation and advanced control engineering chapters follow a progressive structure which builds from modeling fundamentals to analysis and advanced control while showing the interconnections between topics and solved problems and examples are included throughout students can easily recall key topics and test understanding using review note and concept quiz boxes and over 200 end of chapter homework exercises with accompanying concept keys are included focusing on practical understanding students will gain hands on experience of many modern matlab tools including simulink and physical modeling in simscapetm with a solutions manual matlab code and simulink simscapetm files available online this is ideal for senior undergraduates taking courses on modeling analysis and control of dynamic systems as well as graduates studying control engineering

Dynamic Systems and Control Engineering

2023-05-31

space geodetic techniques e g global navigation satellite systems gnss very long baseline interferometry vlbi satellite gravimetry and altimetry and gnss reflectometry

Geodetic Sciences

2013-05-29

the systematic approach to innovation development today is one of the world s most prominent scientific fields and with good reason when applied correctly such system produces regular outcomes which consistently drive lasting competitive advantage unfortunately as much as it is beneficial the orchestration of an undisturbed flow of multiple complex dynamic and flexible innovation development processes is structurally demanding in this book a recognised innovation management specialist sets the record straight offering a comprehensive approach to the improvement of innovation efficiency with the use of management control system unlike other books on the subject it proposes original representation the cdi model of the relationships between management control system decision making quality and innovation system efficiency and explains why management control is fundamental to innovation management in addition to that inside the reader will find several original developments these include the info deficiency i d model depicting the various parameters hindering decision making in innovation development the product innovation development pid system offering the original function based approach to innovation management and the composite innovation index specially designed tool intended to evaluate the efficiency of an innovation development system it will be of interest to researchers academics practitioners and advanced students in the fields of management strategy and innovation chapter 4 of this book is freely available as a downloadable open access pdf under a creative commons attribution non commercial no derivatives 4 0 license available at taylorfrancis com

Management Control Systems, Decision-Making, and Innovation Development

2021-10-03

master techniques and successfully build models using a single resource vital to all data driven or measurement based process operations system identification is an interface that is based on observational science and centers on developing mathematical models from observed data principles of system identification theory and practice is an introductory level book that presents the basic foundations and underlying methods relevant to system identification the overall scope of the book focuses on system identification with an emphasis on practice and concentrates most specifically on discrete time linear system identification useful for both theory and practice the book presents the foundational pillars of identification namely the theory of discrete time lti systems the basics of signal processing the theory of random processes and estimation theory it explains the core theoretical concepts of building linear dynamic models from experimental data as well as the experimental and practical aspects of identification the author offers glimpses of modern developments in this area and provides numerical and simulation based examples case studies end of chapter problems and other ample references to code for illustration and training comprising 26 chapters and ideal for coursework and self study this extensive text provides the essential concepts of identification lays down the foundations of mathematical descriptions of systems random processes and estimation in the context of identification discusses the theory pertaining to non parametric and parametric models for deterministic plus stochastic lti systems in detail demonstrates the concepts and methods of identification on different case studies presents a gradual development of state space identification and grey box modeling offers an overview of advanced topics of identification namely the linear time varying ltv non linear and closed loop identification discusses a multivariable approach to identification using the iterative principal component analysis embeds matlab codes for illustrated examples in the text at the respective points principles of system identification theory and practice presents a formal base in lti deterministic and stochastic systems modeling and

estimation theory it is a one stop reference for introductory to moderately advanced courses on system identification as well as introductory courses on stochastic signal processing or time series analysis the matlab scripts and simulink models used as examples and case studies in the book are also available on the author s website arunkt wix com homepage textbook c397

Principles of System Identification

2018-10-08

this book constitutes the revised selected papers of the 13th international conference on service oriented computing icsoc 2015 held in goa india in november 2015 the conference hosted the following seven workshops 11th international workshop on engineering service oriented applications wesoa 2015 second workshop on resource management in service oriented computing rmsoc 2015 workshop on intelligent service clouds isc 2015 second workshop on intelligent service clouds first international workshop on dependability issues in services computing disco 2015 workshop on engineering for service oriented enterprises wese 2015 first international workshop on big data services and computational intelligence bsci 2015 joined with isc 2015 and second international workshop on formal modeling and verification of service based systems for moves 2015 the 22 full papers included in this volume were carefully reviewed and selected from 45 submissions

Service-Oriented Computing – ICSOC 2015 Workshops

2016-04-25

this book is a concise navigator across the history of cybernetics its state of the art and prospects the evolution of cybernetics from n wiener to the present day and the reasons of its ups and downs are presented the correlation of cybernetics with the philosophy and methodology of control as well as with system theory and systems analysis is clearly demonstrated the book presents a detailed analysis focusing on the modern trends of research in cybernetics a new development stage of cybernetics the so called cybernetics 2 0 is discussed as a science on general regularities of systems organization and control the author substantiates the topicality of elaborating a new branch of cybernetics i e organization theory which studies an organization as a property process and system the book is intended for theoreticians and practitioners as well as for students postgraduates and doctoral candidates in the first place the target audience includes tutors and lecturers preparing courses on cybernetics control theory and systems science

Cybernetics

2015-12-09

automatic control with interactive tools is a textbook for undergraduate study of automatic control providing a clear course structure and covering concepts taught in engineering degrees this book is an ideal companion to those studying or teaching automatic control the authors have used this text successfully to teach their students by providing unique interactive tools which have been designed to illustrate the most important automatic control concepts automatic control with interactive tools helps students overcome the potential barriers presented by the significant mathematical content of automatic control courses even when they have previously had only the benefit of an introductory control course the software tools presented will help readers to get to grips with the use of such techniques as differential equations linear algebra and differential geometry this textbook covers the breadth of automatic control topics including time responses of dynamic systems the nyquist criterion and pid control it switches smoothly between analytical and practical approaches automatic control with interactive tools offers a clear introduction to automatic control ideal for undergraduate students instructors and anyone wishing to familiarize themselves with the fundamentals of the subject

Automatic Control with Interactive Tools

2023-06-27

in this book highly qualified scientists present their recent research motivated by the importance of electric machines it addresses advanced studies for high speed electrical machine design mechanical design of rotors with surface mounted permanent magnets design of motor drive for brushless dc motor single phase motors for household applications battery electric propulsion systems for competition racing applications robust diagnosis by observer using the bond graph approach a dc motor simulator based on virtual instrumentation start up of a pid fuzzy logic embedded control system for the speed of a dc motor using labview advanced control of the permanent magnet synchronous motor and optimization of fuzzy logic controllers by particle swarm optimization to increase the lifetime in power electronic stages

Electric Machines for Smart Grids Applications

2018-12-12

while there are many books on advanced control for specialists there are few that present these topics for nonspecialists assuming only a basic knowledge of automatic control and signals and systems optimal and robust control advanced topics with matlab offers a straightforward self contained handbook of advanced topics and tools in automatic

Optimal and Robust Control

2012-02-02

this book reflects the latest developments in variable structure systems vss and sliding mode control smc highlighting advances in various branches of the vss smc field e g from conventional smc to high order smc from the continuous time domain to the discrete time domain from theories to applications etc the book consists of three parts and 16 chapters in the first part new vss smc algorithms are proposed and their properties are analyzed while the second focuses on the use of vss smc techniques to solve a variety of control problems the third part examines the applications of vss smc to real time systems the book introduces postgraduates and researchers to the state of the art in vss smc field including the theory methodology and applications relative academic disciplines include automation mathematics electrical engineering mechanical engineering instrument science and engineering electronic engineering computer science and technology transportation engineering energy and power engineering etc

Advances in Variable Structure Systems and Sliding Mode Control—Theory and Applications

2017-08-10

robust control mechanisms customarily require knowledge of the system s describing equations which may be of the high order differential type in order to produce these equations mathematical models can often be derived and correlated with measured dynamic behavior there are two flaws in this approach one is the level of inexactness introduced by linearizations and the other when no model is apparent several years ago a new genre of control systems came to light that are much less dependent on differential models such as fuzzy logic and genetic algorithms both of these soft computing solutions require quite considerable a priori system knowledge to create a control scheme and sometimes complicated training program before they can be implemented in a real world dynamic system michie and chambers boxes methodology created a black box system that was designed to control a mechanically unstable system with very little a priori system knowledge linearization or approximation all the method needed was some notion of maximum and minimum values for the state variables and a set of boundaries that divided each variable into an integer state number the boxes

methodology applies the method to a variety of systems including continuous and chaotic dynamic systems and discusses how it may be possible to create a generic control method that is self organizing and adaptive that learns with the assistance of near neighbouring states the boxes methodology introduces students at the undergraduate and master s level to black box dynamic system control and gives lecturers access to background materials that can be used in their courses in support of student research and classroom presentations in novel control systems and real time applications of artificial intelligence designers are provided with a novel method of optimization and controller design when the equations of a system are difficult or unknown researchers interested in artificial intelligence ai research and models of the brain and practitioners from other areas of biology and technology are given an insight into how ai software can be written and adapted to operate in real time

The BOXES Methodology

2012-03-14

the concurrent engineering ce approach was developed in the 1980s based on the concept that different phases of a product life cycle should be conducted concurrently and initiated as early as possible within the product creation process pcp ce concepts have matured and become the foundation of many new ideas methodologies initiatives approaches and tools this book contains the proceedings from the 23rd ispe inc international conference on transdisciplinary formerly concurrent engineering held in curitiba parana brazil in october 2016 the conference entitled transdisciplinary engineering crossing boundaries provides an important forum for international scientific exchange on concurrent engineering and collaborative enterprises and attracts the participation of researchers industry experts and students as well as government representatives the 108 peer reviewed papers and keynote speech included here range from theoretical and conceptual to strongly pragmatic works which are organized into 17 sections including concurrent engineering and knowledge exchange engineering for sustainability multidisciplinary project management collaborative design and engineering optimization of engineering operations and data analytics and multidisciplinary design optimization among others the book gives an overview of the latest research advancements and applications in the field and will be of interest to researchers design practitioners and educators

Transdisciplinary Engineering: Crossing Boundaries

2016-10-13

this book covers the most recent developments in adaptive dynamic programming adp the text begins with a thorough background review of adp making sure that readers are sufficiently familiar with the fundamentals in the core of the book the authors address first discrete and then continuous time systems coverage of discrete time systems starts with a more general form of value iteration to demonstrate its convergence optimality and stability with complete and thorough theoretical analysis a more realistic form of value iteration is studied where value function approximations are assumed to have finite errors adaptive dynamic programming also details another avenue of the adp approach policy iteration both basic and generalized forms of policy iteration based adp are studied with complete and thorough theoretical analysis in terms of convergence optimality stability and error bounds among continuous time systems the control of affine and nonaffine nonlinear systems is studied using the adp approach which is then extended to other branches of control theory including decentralized control robust and guaranteed cost control and game theory in the last part of the book the real world significance of adp theory is presented focusing on three application examples developed from the authors work renewable energy scheduling for smart power grids coal gasification processes and water gas shift reactions researchers studying intelligent control methods and practitioners looking to apply them in the chemical process and power supply industries will find much to interest them in this thorough treatment of an advanced approach to control

Adaptive Dynamic Programming with Applications in Optimal Control

2017-01-04

this book focuses on how the boxes methodology which is based on the work of donald michie is applied to ill defined real time control systems with minimal a priori knowledge of the system the method is applied to a variety of systems including the familiar pole and cart this second edition includes a new section that covers some further observations and thoughts problems and evolutionary extensions that the reader will find useful in their own implementation of the method this second edition includes a new section on how to handle jittering about a system boundary which in turn causes replicated run times to become part of the learning mechanism it also addresses the aging of data values using a forgetfulness factor that causes wrong values of merit to be calculated another question that is addressed is should a boxes cell ever be considered fully trained and if so excluded from further dynamic updates finally it expands on how system boundaries may be shifted using data from many runs using an evolutionary paradigm

The BOXES Methodology Second Edition

2021-11-18

this book constitutes the refereed proceedings of the 13th international conference on augmented cognition ac 2019 held as part of the 21st international conference on human computer interaction hcii 2019 in orlando fl usa in july 2019 the 1274 full papers and 209 posters presented at the hcii 2019 conferences were carefully reviewed and selected from 5029 submissions the papers cover the entire field of human computer interaction addressing major advances in knowledge and effective use of computers in a variety of applications areas the papers in this volume are organized in the following topical sections cognitive modeling perception emotion and interaction human cognition and behavior in complex tasks and environments brain computer interfaces and electroencephalography and augmented learning

Augmented Cognition

2019-07-10

since the foundation and up to the current state of the art in control engineering the problems of pid control steadily attract great attention of numerous researchers and remain inexhaustible source of new ideas for process of control system design and industrial applications pid control effectiveness is usually caused by the nature of dynamical processes conditioned that the majority of the industrial dynamical processes are well described by simple dynamic model of the first or second order the efficacy of pid controllers vastly falls in case of complicated dynamics nonlinearities and varying parameters of the plant this gives a pulse to further researches in the field of pid control consequently the problems of advanced pid control system design methodologies rules of adaptive pid control self tuning procedures and particularly robustness and transient performance for nonlinear systems still remain as the areas of the lively interests for many scientists and researchers at the present time the recent research results presented in this book provide new ideas for improved performance of pid control applications

Advances in PID Control

2011-09-06

this book presents the proceedings of the 8th international workshop on soft computing applications sofa 2018 held on 13 15 september 2018 in arad romania the workshop was organized by aurel vlaicu university of arad in conjunction with the institute of computer science iasi branch of the romanian academy ieee romanian section romanian society of control engineering and technical informatics arad section general association of engineers in romania arad section and btm resources arad the papers included in these proceedings published post conference cover the research including knowledge based technologies for applications cloud computing security algorithms and computer networks business process management computational intelligence in education and modelling and applications in textiles and many other areas related to the soft computing the book is directed to professors researchers and graduate students in area of soft computing techniques and applications

Soft Computing Applications

2020-08-14

the block diagrams as engineering means for closed loop control which have been established by classic control theory for decades are replaced in the above mentioned book by networks the signals are replaced by data it corresponds to the industry 4 0 and to the structure of today s automatic control systems thereby a classic closed loop is treated not isolated from other elements of nowadays automation like bus communication and process logical control and is completed in proposed book with new control elements so called data stream managers dsm the proposed book treats the control theory systematically like it is done in classical books considering the new concept of data management the theory is accompanied in the book with examples exercises with solutions and matlab simulations

Closed Loop Control and Management

2023-02-13

this book presents the proceedings of the 10th conference on theory and applications of soft computing computing with words and perceptions icsccw 2019 held in prague czech republic on august 27 28 2019 it includes contributions from diverse areas of soft computing and computing with words such as uncertain computation decision making under imperfect information neuro fuzzy approaches deep learning natural language processing and others the topics of the papers include theory and applications of soft computing information granulation computing with words computing with perceptions image processing with soft computing probabilistic reasoning intelligent control machine learning fuzzy logic in data analytics and data mining evolutionary computing chaotic systems soft computing in business economics and finance fuzzy logic and soft computing in earth sciences fuzzy logic and soft computing in engineering fuzzy logic and soft computing in material sciences soft computing in medicine biomedical engineering and pharmaceutical sciences showcasing new ideas in the field of theories of soft computing and computing with words and their applications in economics business industry education medicine earth sciences and other fields it promotes the development and implementation of these paradigms in various real world contexts this book is a useful guide for academics practitioners and graduates

10th International Conference on Theory and Application of Soft Computing, Computing with Words and Perceptions - ICSCCW-2019

2019-11-19

this book systematically discusses the algorithms and principles for achieving stable and optimal beam or products of the beam parameters in particle accelerators a four layer beam control strategy is introduced to structure the subsystems related to beam controls such as beam device control beam feedback and beam optimization this book focuses on the global control and optimization layers as a basis of global control the beam feedback system regulates the beam parameters against disturbances and stabilizes them around the setpoints the global optimization algorithms such as the robust conjugate direction search algorithm genetic algorithm and particle swarm optimization algorithm are at the top layer determining the feedback setpoints for optimal beam qualities in addition the authors also introduce the applications of machine learning for beam controls selected machine learning algorithms such as supervised learning based on artificial neural networks and gaussian processes and reinforcement learning are discussed they are applied to configure feedback loops accelerate global optimizations and directly synthesize optimal controllers authors also demonstrate the effectiveness of these algorithms using either simulation or tests at the swissfel with this book the readers gain systematic knowledge of intelligent beam controls and learn the layered architecture guiding the design of practical beam control systems

Intelligent Beam Control in Accelerators

2023-05-11

polynomials are well known for their ability to improve their properties and for their applicability in the interdisciplinary fields of engineering and science many problems arising in engineering and physics are mathematically constructed by differential equations most of these problems can only be solved using special polynomials special polynomials and orthonormal polynomials provide a new way to analyze solutions of various equations often encountered in engineering and physical problems in particular special polynomials play a fundamental and important role in mathematics and applied mathematics until now research on polynomials has been done in mathematics and applied mathematics only this book is based on recent results in all areas related to polynomials divided into sections on theory and application this book provides an overview of the current research in the field of polynomials topics include cyclotomic and littlewood polynomials descartes rule of signs obtaining explicit formulas and identities for polynomials defined by generating functions polynomials with symmetric zeros numerical investigation on the structure of the zeros of the q tangent polynomials investigation and synthesis of robust polynomials in uncertainty on the basis of the root locus theory pricing basket options by polynomial approximations and orthogonal expansion in time domain method for solving maxwell s equations using paralleling in order scheme

Polynomials

2019-05-02

this book constitutes the refereed proceedings of the 12th international conference on hybrid systems computation and control hscc 2009 held in san francisco ca usa in april 2009 the 30 revised full papers and 10 revised short papers presented were carefully reviewed and selected from numerous submissions for inclusion in the book the papers focus on research in embedded reactive systems involving the interplay between symbolic discrete and continuous dynamical behaviors and feature the latest developments of applications and theoretical advancements in the analysis design control optimization and implementation of hybrid systems

Hybrid Systems: Computation and Control

2009-04-30

this is the first volume of the two volume book on linear algebra in the university of tokyo utokyo engineering course the objective of this volume is to present from the engineering viewpoint the standard mathematical results in linear algebra such as those on systems of equations and eigenvalue problems in addition to giving mathematical theorems and formulas it explains how the mathematical concepts such as rank eigenvalues and singular values are linked to engineering applications and numerical computations in particular the following four aspects are emphasized

Linear Algebra I: Basic Concepts

2022-07-13

this book reports on the 12th international workshop on railway noise held on 12 16 september 2016 at terrigal australia it gathers peer reviewed papers describing the latest developments in rail noise and vibration as well as state of the art reviews by distinguished experts in the field the papers cover a broad range of rail noise topics including wheel squeal policy regulation and perception wheel and rail noise predictions measurements and monitoring interior noise rail roughness corrugation and grinding high speed rail and aerodynamic noise and structure borne noise ground borne vibration and resilient track forms it offers an essential reference guide to both scientists and engineers in their daily efforts to identify understand and solve a number

of problems related to railway noise and vibration and to achieve their ultimate goal of reducing the environmental impact of railway systems

Noise and Vibration Mitigation for Rail Transportation Systems

2018-05-19

the increasing demands for internal combustion engines with regard to fuel consumption emissions and driveability lead to more actuators sensors and complex control functions a systematic implementation of the electronic control systems requires mathematical models from basic design through simulation to calibration the book treats physically based as well as models based experimentally on test benches for gasoline spark ignition and diesel compression ignition engines and uses them for the design of the different control functions the main topics are development steps for engine control stationary and dynamic experimental modeling physical models of intake combustion mechanical system turbocharger exhaust cooling lubrication drive train engine control structures hardware software actuators sensors fuel supply injection system camshaft engine control methods static and dynamic feedforward and feedback control calibration and optimization hil rcp control software development control of gasoline engines control of air fuel ignition knock idle coolant adaptive control functions control of diesel engines combustion models air flow and exhaust recirculation control combustion pressure based control hcci optimization of feedforward and feedback control smoke limitation and emission control this book is an introduction to electronic engine management with many practical examples measurements and research results it is aimed at advanced students of electrical mechanical mechatronic and control engineering and at practicing engineers in the field of combustion engine and automotive engineering

Engine Modeling and Control

2014-07-01

this book constitutes the refereed proceedings of the 21st international conference on applications of natural language to information systems nldb 2016 held in salford uk in june 2016 the 17 full papers 22 short papers and 13 poster papers presented were carefully reviewed and selected from 83 submissions the papers cover the following topics theoretical aspects algorithms applications architectures for applied and integrated nlp resources for applied nlp and other aspects of nlp

Natural Language Processing and Information Systems

2016-06-16