**Engineering**

**Analysis, Retrieval and Delivery of Multimedia Content**

Contents


**Fields of interests**

Signal, Image and Speech Processing; Multimedia Information Systems; Communications Engineering, Networks

**Target groups**

Research

**Discount group**

Professional Non-Medical

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**S. Akbarov, Yildiz Technical University, Turkey**

**Stability Loss and Buckling Delamination**

**Three-Dimensional Linearized Approach for Elastic and Viscoelastic Composites**

This book investigates stability loss problems of the viscoelastic composite materials and structural members within the framework of the Three-Dimensional Linearized Theory of Stability (TDLTS). The stability loss problems are considered the development of the initial infinitesimal imperfection in the structure of the material or of the structural members.

**Features**

- Examines on composite materials with analytical and numerical methods
- Uses the Three-Dimensional Geometrical Non-Linear Theory
- Considers also micro-buckling

**Contents**


**Fields of interests**

Continuum Mechanics and Mechanics of Materials; Computational Mathematics and Numerical Analysis; Ceramics, Glass, Composites, Natural Materials

**Target groups**

Research

**Discount group**

Professional Non-Medical

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**E. Alba, University of Malaga, Spain; A. Nakib, P. Siarry, University Paris-Est Créteil Val de Marne, France (Eds)**

**Metaheuristics for Dynamic Optimization**

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.

**Features**

- Recent research on Metaheuristics for Dynamic Optimization
- Carefully edited book
- Written by leading experts in the field

**Contents**


**Fields of interests**

Computational Intelligence; Artificial Intelligence (incl. Robotics)

**Target groups**

Research

**Discount group**

Professional Non-Medical

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**Due July 2012**

2012. XXII, 296 p. 128 illus., 39 in color. (Lecture Notes in Electrical Engineering, Volume 158) Hardcover

- $179.00
- ISBN 978-1-4614-3830-4

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**Available**


- $179.00
- ISBN 978-3-642-30289-3

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**Available**

2012. XII, 405 p. (Studies in Computational Intelligence, Volume 433) Hardcover

- $179.00
- ISBN 978-3-642-30664-8
Frequency Domain Criteria for Absolute Stability

A Delay-integral-quadratic Constraints Approach

Frequency Domain Criteria for Absolute Stability focuses on recently-developed methods of delay-integral-quadratic constraints to provide criteria for absolute stability of nonlinear control systems. The known or assumed properties of the system are the basis from which stability criteria are developed. Through these methods, many classical results are naturally extended, particularly to time-periodic but also to nonstationary systems. Mathematical prerequisites including Lebesgue-Stieljes measures and integration are first explained in an informal style with technically more difficult proofs presented in separate sections that can be omitted without loss of continuity. The results are presented in the frequency domain—the form in which they naturally tend to arise. In some cases, the frequency-domain criteria can be converted into computationally tractable linear matrix inequalities but in others, especially those with a certain geometric interpretation, inferences concerning stability can be made directly from the frequency-domain inequalities.

Features
- Shows the reader a new method for obtaining results in stability theory
- Presents important new results for increasing nonlinear system stability
- Self-contained presentation of prerequisite background mathematics

Contents

Fields of interests
Control; Systems Theory, Control

Target groups
Research

Discount group
Professional Non-Medical

Available
2012. VIII, 156 p. 13 illus., 9 in color. (Lecture Notes in Control and Information Sciences, Volume 432) Softcover
► $109.00
ISBN 978-1-4471-4233-1

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Advanced Finite Element Methods and Applications

This volume on some recent aspects of finite element methods and their applications is dedicated to Ulrich Langer and Arnd Meyer on the occasion of their 60th birthdays in 2012. Their work combines the numerical analysis of finite element algorithms, their efficient implementation on state-of-the-art hardware architectures, and the collaboration with engineers and practitioners.

Features
- Latest results in Advanced Finite Element Methods and Applications
- Written by leading experts in this field

Contents

Fields of interests
Theoretical and Applied Mechanics; Applied Mathematics/Computational Methods of Engineering; Mechanics

Target groups
Research

Discount group
Professional Non-Medical

Available
► $179.00
ISBN 978-3-642-30315-9

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Analog Dithering Techniques for Wireless Transmitters

This book describes innovative techniques and the theoretical background for design and analysis of high performance RF/Microwave transmitters. It introduces new, robust linearization/efficiency enhancement techniques, applicable to all of the switched mode power amplifiers. Novel analysis methods associated with these new techniques are also introduced and supporting measurement results are documented. Innovative graphical representation methods are used to help the reader understand the matter intuitively.

Features
- Introduces novel dithering techniques for linearization of a highly nonlinear power amplifiers, which are easy to implement
- Enables more economical design of linear-efficient microwave transmitters
- Provides power amplifier designers with new tools to address the linearity-efficiency compromise, a key challenge for any application and frequency range
- Uses an intuitive and simple approach to present necessary details, along with graphical representation methods to enhance understanding

Contents

Fields of interests
Circuits and Systems; Electronics and Microelectronics, Instrumentation; Signal, Image and Speech Processing

Target groups
Research

Discount group
Professional Non-Medical

Available
2012. XI, 168 p. 81 illus., 5 in color. (Analog Circuits and Signal Processing, Volume 3) Hardcover
► $129.00
Towards Advanced Data Analysis by Combining Soft Computing and Statistics

Soft computing, as an engineering science, and statistics, as a classical branch of mathematics, emphasize different aspects of data analysis.

Features
- The book aims to describe how soft computing and statistical methods can be used together to improve data analysis
- Advances research in soft computing and statistical methods for data analysis
- Written by leading experts in the field

Contents

Fields of interests
Computational Intelligence; Probability and Statistics in Computer Science; Data Mining and Knowledge Discovery

Target groups
Research

Discount group
Professional Non-Medical

Available
$179.00
ISBN 978-3-642-30277-0

Computational Intelligence in Image Processing

Contents
M. Como, University of Roma Torvergata, Italy  
Structures of Historic Masonry Constructions

Masonry constructions are the great majority of the buildings in Europe’s historical centres and the most important monuments in its architectural heritage and the demand for their safety assessments and restoration projects is pressing and constant. Nevertheless, there is a lack of a widely accepted approach to studying the statics of masonry structures. This book aims to help fill these gaps by presenting a new comprehensive, unified theory of statics of masonry constructions.

Features
- Presents a new comprehensive, unified theory of statics of masonry constructions  
- Interdisciplinary approach analyzing the statics of a large variety of masonry constructions such as arches, domes, and cloister vaults, piers, towers, cathedrals and buildings under seismic actions  
- Written by a leading expert in the field

Contents

Fields of interests
Structural Mechanics; Continuum Mechanics and Mechanics of Materials; Architectural History and Theory

Target groups
Research

Discount group
Professional Non-Medical
P. S. Diniz, Federal University of Rio de Janeiro, Brazil

**Adaptive Filtering**

*Algorithms and Practical Implementation*

In the fourth edition of Adaptive Filtering: Algorithms and Practical Implementation, author Paulo S. R. Diniz presents the basic concepts of adaptive signal processing and adaptive filtering in a concise and straightforward manner. The main classes of adaptive filtering algorithms are presented in a unified framework, using clear notations that facilitate actual implementation. The main algorithms are described in tables, which are detailed enough to allow the reader to verify the covered concepts.

**Features**

- Presents adaptive filtering algorithms in a unified framework and using a clear notation that facilitates their actual implementation.
- Accompanying supplementary material including password-protected Instructor Solutions Manual, slides in PDF and user-friendly MATLAB package available for download.
- Many analytical and practical examples are included in the text.
- Covers the family of LMS, affine projection, RLS and data-selective set-membership algorithms as well as non-linear, sub-band, blind and IIR adaptive filtering.

**Contents**

Introduction to Adaptive Filtering.
- Fundamentals of Adaptive Filtering.
- The Least-Mean-Square (LMS) Algorithm.
- LMS-Based Algorithms.
- Conventional RLS Adaptive Filter.
- Data-Selective Adaptive Filtering.
- Adaptive Lattice-Based RLS Algorithms.
- Fast Transversal RLS Algorithms.
- QR-Decomposition-Based RLS Filters.
- Adaptive IIR Filters.
- Nonlinear Adaptive Filtering.
- Subband Adaptive Filters.
- Blind Adaptive Filtering.

**Fields of interest**

Signal, Image and Speech Processing; Circuits and Systems; Communications Engineering, Networks

**Discount group**

Graduate

Professional Non-Medical

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A. Elibol, Yildiz Technical University, Istanbul, Turkey;
N. Gracias, R. Garcia, University of Girona, Spain

**Efficient Topology Estimation for Large Scale Optical Mapping**

Large scale optical mapping methods are in great demand among scientists who study different aspects of the seabed, and have been fostered by impressive advances in the capabilities of underwater robots in gathering optical data from the seafloor. Cost and weight constraints mean that low-cost ROVs usually have a very limited number of sensors. When a low-cost robot carries out a seafloor survey using a down-looking camera, it usually follows a predefined trajectory that provides several non-time-consecutive overlapping image pairs. Finding these pairs (a process known as topology estimation) is indispensable to obtaining globally consistent mosaics and accurate trajectory estimates, which are necessary for a global view of the surveyed area, especially when optical sensors are the only data source.

**Features**

- Presents computational algorithms for the efficient estimation of large-scale photomosaics.
- Presents consistent tools for creating large area image mosaics from optical data obtained during surveys with low-cost underwater vehicles.
- Written by leading experts in the field.

**Contents**

Feature-Based Image Mosaicing.
- New Global Alignment Method.
- Topology Estimation using Bundle Adjustment.
- Conclusions.
- ASKF-EKF Framework for Topology Estimation using Bundle Adjustment.

**Fields of interest**

Robotics and Automation; Artificial Intelligence (incl. Robotics); Signal, Image and Speech Processing

**Discount group**

Research

Professional Non-Medical

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B. Evans, Atherstone, UK

**Tragedy and Triumph in Orbit**

*The Eighties and Early Nineties*

April 12, 2011 is the 50th anniversary of Yuri Gagarin’s pioneering journey into space. To commemorate this momentous achievement, Springer-Praxis is producing a mini series of books that reveals how humanity’s knowledge of flying, working, and living in space has grown in the last half century. “Tragedy and Triumph” focuses on the 1980s and early 1990s, a time when relations between the United States and the Soviet Union swung like a pendulum between harmony and outright hostility. The glorious achievements of the shuttle were violently arrested by the devastating loss of Challenger in 1986, while the Soviet program appeared to prosper with the last Salyut and the next-generation Mir orbital station.

**Features**

- Continues the History of the Human Space Exploration miniseries by Evans, which commemorates over 50 years of humans in space.
- Explores the continued rivalry between the two superpowers during the Eighties to the early Nineties.
- Sets the human space program in its political, historical, and cultural setting.
- Offers a comprehensive, stand-alone survey of a significant portion of the human space story.

**Contents**

Illustrations.
- Author’s Preface.
- Acknowledgements.
- Chapter 1: “We deliver”.
- Chapter 2: A final Soviet salute.
- Chapter 3: An age of innocence.
- Chapter 4: Road to Peace.
- Chapter 5: New beginnings.
- Bibliography.

**Fields of interest**

Aerospace Technology and Astronautics; Popular Science in Astronomy; Extraterrestrial Physics, Space Sciences

**Discount group**

Popular/general

Professional Non-Medical
Complex Networks

In the last decade we have seen the emergence of a new inter-disciplinary field concentrating on the understanding large networks which are dynamic, large, open, and have a structure that borders order and randomness. The field of Complex Networks has helped us better understand many complex phenomena such as spread of decease, protein interaction, social relationships, to name but a few. The field of Complex Networks has received a major boost caused by the widespread availability of huge network data resources in the last years. One of the most surprising findings is that real networks behave very distinct from traditional assumptions of network theory. Traditionally, real networks were supposed to have a majority of nodes of about the same number of connections around an average. This is typically modeled by random graphs. But modern network research could show that the majority of nodes of real networks is very low connected, and, by contrast, there exists some nodes of very extreme connectivity (hubs).

Features
- Latest research on Complex Networks
- Results of the 3rd Workshop on Complex Networks CompleNet 2012, Melbourne, Florida, USA March 7-9, 2012
- Written by leading experts in the field

Contents
Network Measures and Models.- Agents, Communication and Mobility.- Communities, Clusters and Partitions.- Emergence in Networks.- Social Structures and Networks.- Networks in Biology and Medicine.- Applications of Networks.

Fields of interests
Computational Intelligence; Complexity; Complex Networks

Target groups
Research

Discount group
Professional Non-Medical

Reference-Free CMOS Pipeline Analog-to-Digital Converters

This book shows that digitally assisted analog to digital converters are not the only way to cope with poor analog performance caused by technology scaling. It describes various analog design techniques that enhance the area and power efficiency without employing any type of digital calibration circuitry. These techniques consist of self-biasing for PVT enhancement, inverter-based design for improved speed/power ratio, gain-of-two obtained by voltage sum instead of charge redistribution, and current-mode reference shifting instead of voltage reference shifting.

Features
- Describes various design techniques to enhance the power and area efficiency of building blocks for multiplying digital-to-analog converter (MDAC) based ADCs, such as Pipeline, Algorithmic, and multi-step Flash
- Enables analog designers to enhance the performance of a range of circuits, without employing any type of digital assistance (calibration)
- Includes complete design flow of an ADC based on the proposed circuits and design techniques

Contents

Fields of interests
Circuits and Systems; Electronics and Microelectronics, Instrumentation

Target groups
Research

Discount group
Professional Non-Medical

Video Image Detection Systems Installation Performance Criteria

Video Image Detection Systems Installation Performance Criteria outlines fire performance objectives and related criteria for VID systems. The book also identifies conceptual characteristic fire, smoke and nuisance scenarios within a series of selected environments, and examines related performance and installation issues as well. Video Image Detection Systems Installation Performance Criteria is designed for practitioners as a reference guide for implementing video systems capable of quickly detecting smoke and fire. Researchers working in a related field will also find the book valuable.

Contents

Fields of interests
Signal, Image and Speech Processing; Image Processing and Computer Vision; Pattern Recognition

Target groups
Professional/practitioner

Discount group
Professional Non-Medical
Complex Automated Negotiations: Theories, Models, and Software Competitions

Complex Automated Negotiations are a widely studied, emerging area in the field of Autonomous Agents and Multi-Agent Systems. In general, automated negotiations can be complex, since there are a lot of factors that characterize such negotiations. For this book, we solicited papers on all aspects of such complex automated negotiations, which are studied in the field of Autonomous Agents and Multi-Agent Systems. This book includes two parts, which are Part I: Agent-based Complex Automated Negotiations and Part II: Automated Negotiation Agents Competition. Each chapter in Part I is an extended version of ACAN 2011 papers after peer reviews by three PC members. Part II includes ANAC 2011 (The Second Automated Negotiating Agents Competition), in which automated agents who have different negotiation strategies and implemented by different developers are automatically negotiate in the several negotiation domains.

Features
- Explains the basics of the MRI and its use in the diagnostics and the treatment of the human brain disorders
- Examines multi-quantum magnetic resonance imaging methods and the diagnostics of brain disorders
- Covers how in a non-invasive manner one can diagnose diseases of the brain

Contents
Part I: Introduction.- Simplistic theory of the functions of the ensemble of the electrons, atoms, molecules, nuclei, in the brain.- Practical Illustrations.- Quantum spin dynamics and the MRI.- The density matrix concept.- The imaging.- Illustrations.- Quantum spin dynamics and the atoms, molecules, nuclei, in the brain.- Practical illustrations are included both on recent developments in conventional MRI and the MQ-MRI.

Features
- Latest research on Complex Automated Negotiations
- Presents Theories, Models, and Software Competitions
- Written by leading experts in the field

Contents
Part I Agent-based Complex Automated Negotiations.- Part II Automated Negotiating Agents Competition.

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical
Evolutionary based Solutions for Green Computing

Today's highly parameterized large-scale distributed computing systems may be composed of a large number of various components (computers, databases, etc) and must provide a wide range of services.

Features
- Comprehensive summarization of the development for evolutionary computing based green computing solutions
- Complete coverage from basic theory, methodologies, to real-world applications
- Outlines development trends and open research issues on green IT

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics); Renewable and Green Energy

Target groups
Research

Discount group
Professional Non-Medical

IAENG Transactions on Engineering Technologies

Special Edition of the World Congress on Engineering and Computer Science 2011

This volume contains thirty revised and extended research articles written by prominent researchers participating in an international conference in engineering technologies and physical science and applications. The conference serves as a good platform for the engineering community to meet with each other and to exchange ideas. The conference has also struck a balance between theoretical and application development. The conference is truly international meeting with a high level of participation from many countries.

Features
- Offers the state of art of advances in engineering technologies and physical science and applications
- Serves as a good reference work for researchers and graduate students working with/ on engineering technologies and physical science and applications

Contents

Fields of interests
Communications Engineering, Networks; Appl. Mathematics/Computational Methods of Engineering; Software Engineering/Programming and Operating Systems

Target groups
Research

Discount group
Professional Non-Medical

IGEN Transactions on Engineering Technologies

Evolutionary based Solutions for Green Computing

Evolutionary Genetic Regulatory Networks: Evolvable, Self-organizing Systems

Genetic Regulatory Networks (GRNs) in biological organisms are primary engines for cells to enact their engagements with environments, via incessant, continually active coupling. In differentiated multicellular organisms, tremendous complexity has arisen in the course of evolution of life on earth. Engineering and science have so far achieved no working system that can compare with this complexity, depth and scope of organization. Abstracting the dynamics of genetic regulatory control to a computational framework in which artificial GRNs in artificial simulated cells differentiate while connected in a changing topology, it is possible to apply Darwinian evolution in silico to study the capacity of such developmental/differentiated GRNs to evolve.

Features
- Recent research in Computational Genetic Regulatory Networks
- State of the art in Evolvable and Self-organizing Systems
- Written by a leading expert in the field

Contents
Evolution.- Genetic Regulatory Networks.- Biological Clocks and Differentiation.- Topological Network Analysis.- Development and Morphogenesis.

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical
Advances in Intelligent Modelling and Simulation

Artificial Intelligence-based Models and Techniques in Scalable Computing

One of the most challenging issues in today’s large-scale computational modeling and design is to effectively manage the complex distributed environments, such as computational clouds, grids, ad hoc, and P2P networks operating under various types of users with evolving relationships fraught with uncertainties. In this context, the IT resources and services usually belong to different owners (institutions, enterprises, or individuals) and are managed by different administrators. Moreover, uncertainties are presented to the system at hand in various forms of information that are incomplete, imprecise, fragmentary, or overloading, which hinders in the full and precise resolve of the evaluation criteria, sub branching and selection, and the assignment scores. Intelligent scalable systems enable the flexible routing and charging, advanced user interactions and the aggregation and sharing of geographically-distributed resources in modern large-scale systems. This book presents new ideas, theories, models, technologies, system architectures and implementation of applications in intelligent scalable computing systems.

Features
- Latest research on Artificial Intelligence-based Models and Techniques in Scalable Computing
- Recent Advances in Intelligent Modelling and Simulation
- Written by leading experts in the field

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

Applications of Advanced Electromagnetics
Components and Systems

This text, directed to the microwave engineers and Master and PhD students, is on the use of electromagnetics to the development and design of advanced integrated components distinguished by their extended field of applications. The results of hundreds of authors scattered in numerous journals and conference proceedings are carefully reviewed and classified.

Features
- Introductory book to advanced electromagnetism avoiding complicated mathematics and methods of computations
- Focuses on practical techniques, physics and results
- Presents methodology and current achievements in the developments of advanced integrations for frequencies up to 100 GHz and beyond

Contents

Fields of interests
Electrical Engineering; Microwaves, RF and Optical Engineering; Electronic Circuits and Devices

Target groups
Research

Discount group
Professional Non-Medical

Design, Analysis and Test of Logic Circuits under Uncertainty

Logic circuits are becoming increasingly susceptible to probabilistic behavior caused by external radiation and process variation. In addition, inherently probabilistic quantum- and nano-technologies are on the horizon as we approach the limits of CMOS scaling. Ensuring the reliability of such circuits despite the probabilistic behavior is a key challenge in IC design—one that necessitates a fundamental, probabilistic reformulation of synthesis and testing techniques. This monograph will present techniques for analyzing, designing, and testing logic circuits with probabilistic behavior.

Features
- Presents a comprehensive overview of Logic Circuits
- Combines theory with practical examples
- Multi-discipline approach to the “hot” topic of uncertainty

Contents

Fields of interests
Circuits and Systems; Arithmetic and Logic Structures; Computer Hardware

Target groups
Research

Discount group
Professional Non-Medical

Available
2012. XII, 382 p. (Studies in Computational Intelligence, Volume 422) Hardcover
- $179.00
ISBN 978-3-642-30153-7

Available
2012. XII, 653 p. (Lecture Notes in Electrical Engineering, Volume 169) Hardcover
- $229.00
ISBN 978-3-642-30309-8

Available
2013. 200 p. (Lecture Notes in Electrical Engineering, Volume 115) Hardcover
- approx. $139.00
ISBN 978-3-642-30153-7
High Voltage Engineering
Fundamentals - Technology - Applications

A. Küchler, Fachhochschule Würzburg-Schweinfurt, Schweinfurt

High voltage engineering is not only a key technology for a safe, economic and sustainable electric power supply. Furthermore, a broad spectrum of applications includes most of the innovative fields in engineering and science, such as medical engineering, laser technology, industrial production, automotive engineering, food technology, bioengineering, nanotechnology, environmental protection, recycling, electromagnetic compatibility, scientific research or superconductivity. „High Voltage Engineering: Fundamentals – Technologies – Applications“ is based on the 3rd edition of the leading German standard work „Hochspannungstechnik“, which is both a textbook for students and a reference book for engineers. It provides a unique and successful combination of scientific foundations, basic principles, modern technologies and practical applications, clearly illustrated by many figures, examples and exercises.

Features
➤ Provides a unique and successful combination of scientific foundations, basic principles, modern technologies and practical applications ➤ Clearly illustrated by many figures, examples and exercises

Contents

Fields of interest
Power Electronics, Electrical Machines and Networks

Target groups
Professional/practitioner

Discount group
Professional Non-Medical

Computer and Information Science 2012

R. Lee, Central Michigan University, Mt. Pleasant, MI, USA (Ed)

Software Engineering Research, Management and Applications 2012

R. Lee, Central Michigan University, Mt. Pleasant, MI, USA (Ed)

The series „Studies in Computational Intelligence“ (SCI) publishes new developments and advances in the various areas of computational intelligence – quickly and with a high quality. The intent is to cover the theory, applications, and design methods of computational intelligence, as embedded in the fields of engineering, computer science, physics and life science, as well as the methodologies behind them.

Features
➤ Recent research Computer and Information Science ➤ Edited outcome of the 11th ACIS/IEEE International Conference on Computer and Information Science, held May 30–June 1, 2012 Shanghai, China ➤ Written by leading experts in the field

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics); Software Engineering

Target groups
Research

Discount group
Professional Non-Medical

Available
Original german edition published with title: Hochspannungstechnik
2012. 600 p. 400 illus. Hardcover ➤ approx. $239.00 ISBN 978-3-642-11992-7

Available
2012. XII, 219 p. (Studies in Computational Intelligence, Volume 429) Hardcover ➤ $129.00 ISBN 978-3-642-30453-8

Available
2012. XII, 194 p. (Studies in Computational Intelligence, Volume 430) Hardcover ➤ $129.00 ISBN 978-3-642-30459-0
Interference Cancellation Using Space-Time Processing and Precoding Design

Interference Cancellation Using Space-Time Processing and Precoding Design introduces original design methods to achieve interference cancellation, low-complexity decoding and full diversity for a series of multi-user systems. In multi-user environments, co-channel interference will diminish the performance of wireless communications systems. In this book, we investigate how to design robust space-time codes and pre-coders to suppress the co-channel interference when multiple antennas are available.

Features
- The first book available on the interference cancellation using space-time processing and precoding design.
- Written by a leading scientist in multi-antenna interference cancellation based on space-time precoding design.
- Includes original design procedures and in-depth performance analysis for a series of multi-user systems.
- Offers valuable simulation results for each interference cancellation method used in various multi-user models.
- Provides handy quick-reference for researchers and engineers interested in interference cancellation.

Contents

Fields of interests
Communications Engineering, Networks; Coding and Information Theory; Input/Output and Data Communications

Target groups
Research

Discount group
Professional Non-Medical

Data Provenance and Data Management in eScience

eScience allows scientific research to be carried out in highly distributed environments. The complex nature of the interactions in an eScience infrastructure, which often involves a range of instruments, data, models, application, people and computational facilities, suggests there is a need for data provenance and data management (DPDM). The W3C Provenance Working Group defines the provenance of a resource as a “record that describes entities and processes involved in producing and delivering or otherwise influencing that resource”.

Features
- Recent research on Data Provenance and Data Management for eScience.
- How to use advanced semantic and AI techniques to track and manage information which describe the life cycle of data items and products.
- Written by leading experts in the field.

Contents

Fields of interests
Engineering, general; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

A Tribute to Prof. Dr. Da Ruan

This volume is a tribute to Professor Dr Da Ruan, who passed away suddenly on July 31, 2011, aged 50. The flood of emails that spread throughout the fuzzy logic research community with the tragic news was testimony to the respect and liking felt for this remarkable man. Da was a hardworking, highly productive scientist who, during his short life, published 35 books and more than 250 research papers in highly ranked journals and conference proceedings. He established two successful conferences, FLINS and ISKE, as well as the international journal, JCIS. This book is a collection of contributions from 88 of Da’s academic friends from 47 institutes, presented in 60 chapters and over 70 pictures. A Foreword by Lotfi Zadeh begins Da’s story. Section I provides an overview of Da’s funeral on August 6, 2011. Part II outlines Da’s scientific life, his education, scientific career, publications and keynote talks. Part III presents testimonials by Da’s colleagues of academic activities, including guest professorships and his many visits to foreign institutes.

Features
- Mixture between live and research of Da Ruan.
- Book in memory of Prof. Da Ruan who suddenly passed away in the age of 50.
- Includes a foreword of Lotfi Zadeh.
- Written by leading experts in the field.

Contents
Part I: The Ceremony for Da. - Part II: Da’s Scientific Life. - Part III: Da’s Academic Activities. - Part IV: Thoughts by Da Ruan’s Colleagues and Friends.

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical
**Reconfigurable Switched-Capacitor Power Converters**

**Principles and Designs for Self-Powered Microsystems**

This book provides readers specializing in ultra-low power supply design for self-powered applications an invaluable reference on reconfigurable switched capacitor power converters.

**Features**
- Provides a comprehensive introduction to the fundamentals of switched capacitor power supply design for novices, as well as advanced design and implementation techniques for advanced readers
- Includes discussion of all aspects of switched capacitor power supply designs, from fundamentals, to reconfigurable power stages, and sophisticated controller designs
- Covers most state-of-art power supply designs for emerging applications such as energy harvesting for wireless sensor nodes

**Contents**
- Fundamental Concepts
- Power Semiconductor Devices
- Fundamental Charge Pump Topologies and Design Principles
- Power Loss in Switched-Capacitor Power Converters
- Configuring Switched-Capacitor Power Converters Using Interleaving Regulation Techniques
- Switched-Capacitor Power Converter Design and Modeling in z-Domain

**Fields of interest**
- Circuits and Systems
- Power Electronics
- Electrical Machines and Networks
- Electronics and Microelectronics
- Instrumentation

**Target groups**
- Research

**Discount group**
- Professional Non-Medical

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**Aspects of Computational Intelligence: Theory and Applications**

**Revised and Selected Papers of the 15th IEEE International Conference on Intelligence Engineering Systems 2011, INES 2011**

This volume covers the state-of-the art of the research and development in various aspects of computational intelligence and gives some perspective directions of development. Except the traditional engineering areas that contain theoretical knowledge, applications, designs and projects, the book includes the area of use of computational intelligence in biomedical engineering.

**Features**
- Latest research on Computational Intelligence
- Revised and Selected Papers of the 15th IEEE International Conference on Intelligence Engineering Systems 2011, INES 2011
- Written by leading experts in the field

**Contents**
- Part I: Diagnostics, Performance Monitoring and Conditional – Based Maintenance
- Part II: New Approaches in Mechatronics, Modeling and Human Knowledge
- Part III: Computational Intelligence, Web Technologies and Data Mining
- Part IV: Methodologies, Methods and Algorithms
- Part V: Softcomputing in Biomedical Engineering

**Fields of interest**
- Computational Intelligence: Artificial Intelligence (incl. Robotics)

**Target groups**
- Research

**Discount group**
- Professional Non-Medical

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**DSP Architecture Design Essentials**

In DSP Architecture Design Essentials, authors Dejan Marković and Robert W. Brodersen cover a key subject for the successful realization of DSP algorithms for communications, multimedia, and healthcare applications. The book addresses the need for DSP architecture design that maps advanced DSP algorithms to hardware in the most power- and area-efficient way. The key feature of this text is a design methodology based on a high-level design model that leads to hardware implementation with minimum power and area.

**Features**
- Addresses the gap between DSP algorithm design and hardware implementation
- Presents a methodology for power- and area-efficient architecture design
- Done in close interaction with leading industrial researchers
- Design methodology is verified on a number of chips
- Uses a high-level Matlab/Simulink description
- Online access to tutorials, examples, and software

**Contents**
- Energy and Delay Models
- Circuit Optimization
- Architectural Techniques
- Architecture Flexibility
- Arithmetic for DSP
- CORDIC, Divider, Square Root
- Digital Filters
- Time-Frequency Analysis
- Data-Flow Graph Model
- Wordlength Optimization
- Architectural Optimization
- Simulink-Hardware Flow
- Multi-GHz Radio DSP
- Dedicated MHz-rate Decoders
- Flexible MHz-rate Decoder
- kHz-rate Neural Processors
- Brief Outlook

**Fields of interest**
- Circuits and Systems: Signal, Image and Speech Processing; Electrical Engineering

**Target groups**
- Professional/practitioner

**Discount group**
- Professional Non-Medical
Advanced Energy Saving and its Applications in Industry

The conventional approach for energy saving in a process system is to maximize heat recovery without changing any process conditions by using pinch technology. "Self-heat recuperation technology" was developed to achieve further energy saving in the process system by eliminating the necessity for any external heat input, such as firing or imported steam. Advanced Energy Saving and its Applications in Industry introduces the concept of self-heat recuperation and the application of such technology to a wide range of processes from heavy chemical complexes to other processes such as drying and gas separation processes, which require heating and cooling during operation.

Features
- Provides readers with an understanding of and assistance with conventional energy saving methods in industry
- Introduces new approaches with large energy saving potential
- Explains new practical approaches comprehensively, from the theory to application

Contents

Fields of interests
Renewable and Green Energy; Energy Systems; Industrial and Production Engineering

Target groups
Research

Discount group
Professional Non-Medical

T. Meurer, Vienna University of Technology, Austria

Control of Higher–Dimensional PDEs

This monograph presents new model-based design methods for trajectory planning, feedback stabilization, state estimation, and tracking control of distributed-parameter systems governed by partial differential equations (PDEs). Flatness and backstepping techniques and their generalization to PDEs with higher-dimensional spatial domain lie at the core of this treatise. This includes the development of systematic late lumping design procedures and the deduction of semi-numerical approaches using suitable approximation methods.

Features
- Presents recent model-based methods for motion planning and tracking control design for distributed-parameter systems governed by partial differential equations
- Includes the control theoretic developments and mathematical background
- Provides a rich set of application examples

Contents

Field of interests
Control; Systems Theory, Control

Target groups
Research

Discount group
Professional Non-Medical

P. A. Mohan, Electronics Corporation of India, Ltd., Bangalore, India

VLSI Analog Filters

Active RC, OTA-C, and SC

Great strides have been made in the development of analog filters over the past few decades. The first book to treat these recent advances in depth, "VLSI Analog Filters" provides a comprehensive guide for researchers and upper-level graduate students, which fully prepares readers for professional work. In particular, the work covers active R filters, OTA-C filters, and switched-capacitor filters, including topics such as differential output opamps, sensitivity analysis for passive components, multiple-feedback techniques, double-sampling, and N-path filters. Throughout the book, exercises are included to reinforce understanding of concepts, and simulations are used to enhance connections to practical applications. This advanced textbook is suitable for engineering graduate students studying analog filter design, offering a full course that can feed seamlessly to employment industry.

Features
- Exceptionally comprehensive treatment of continuous-time and switched capacitor filters
- Covers many practical aspects useful for industrial applications
- Describes state-of-the-art methods, such as using fully differential amplifiers for active RC filters
- Includes exercises at the end of each chapter to reinforce concepts

Contents

Field of interests
Electrical Engineering; Engineering Design; Information and Communication, Circuits

Target groups
Graduate

Discount group
Professional Non-Medical
Matrix Information Geometry

This book presents advances in matrix and tensor data processing in the domain of signal, image and information processing. The theoretical mathematical approaches are discussed in the context of potential applications in sensor and cognitive systems engineering. The topics and application include Information Geometry, Differential Geometry of structured Matrix, Positive Definite Matrix, Covariance Matrix, Sensors (Electromagnetic Fields, Acoustic sensors) and Applications in Cognitive systems, in particular Data Mining.

Features
- Presents advances in matrix and tensor data processing in the domain of signal, image and information processing
- Written by experts in the areas of theoretical mathematics or engineering sciences
- Discusses potential applications in sensor and cognitive systems engineering

Contents

Fields of interests
Signal, Image and Speech Processing; Linear and Multilinear Algebras, Matrix Theory; Data Mining and Knowledge Discovery

Target groups
Research

Discount group
Professional Non-Medical

Electromagnetic Compatibility in Railways

Analysis and Management

A railway is a complex distributed engineering system: the construction of a new railway or the modernisation of an existing one requires a deep understanding of the constitutive components and their interaction, inside the system itself and towards the outside world. The former covers the various subsystems (featuring a complex mix of high power sources, sensitive safety critical systems, intentional transmitters, etc.) and their interaction, including the specific functions and their relevance to safety. The latter represents all the additional possible external victims and sources of electromagnetic interaction. EMC thus starts from a comprehension of the emissions and immunity characteristics and the interactions between sources and victims, with a strong relationship to electromagnetics and to system modeling.

Features
- Recent research on electromagnetic compatibility (EMC) applied to railway systems
- Focuses on the principles and application of EMC concepts to railway signalling, communications, power/traction and rolling stocks
- Written by leading experts in the field

Contents

Fields of interests
Electrical Engineering; Electronics and Microelectronics, Instrumentation; Power Electronics, Electrical Machines and Networks

Target groups
Research

Discount group
Professional Non-Medical

Physical Layer Multi-Core Prototyping

A Dataflow-Based Approach for LTE eNodeB

Base stations developed according to the 3GPP Long Term Evolution (LTE) standard require unprecedented processing power. 3GPP LTE enables data rates beyond hundreds of Mbits/s by using advanced technologies, necessitating a highly complex LTE physical layer. The operating power of base stations is a significant cost for operators, and is currently optimized using state-of-the-art hardware solutions, such as heterogeneous distributed systems.

Features
- Introduces innovative methodologies such as a top-down approach to tackle multi-core programming issues and the Parallel and Real-time Embedded Executive Scheduling Method (PREESM)
- Covers important advancements to the state of the art in design methodologies for embedded signal processing systems which can be implemented to lower design, deployment and maintenance costs across a range of wireless data networks
- Includes models and techniques for adaptive scheduling of dataflow graphs to provide robust execution of dataflow tasks on targeted devices

Contents

Fields of interests
Communications Engineering, Networks; Circuits and Systems; Software Engineering

Target groups
Research

Discount group
Professional Non-Medical
Intelligent and Adaptive Educational-Learning Systems
Achievements and Trends

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

The Effect of Hydrogen and Hydrides on the Integrity of Zirconium Alloy Components

Delayed Hydride Cracking

Features
► Gives a coherent, detailed account of the physics of delayed hydrogen cracking ► Provides a reference source for research conducted on the effect of hydrogen and hydrides on the mechanical properties of zirconium alloys ► Provides an account of how the current methodology for the design and periodic assessment of in-service pressure tubes is underpinned by the foregoing results and understanding

Contents

Fields of interest
Continuum Mechanics and Mechanics of Materials; Industrial Chemistry/Chemical Engineering; Metallic Materials

Target groups
Research

Discount group
Professional Non-Medical

Piezoelectric Cantilevered Structures
Modeling, Control and Estimation Aspects

This book reflects new developments in the modeling and control of piezoelectric cantilevers. The main nonlinearities (hysteresis and creep) of these actuators are explained from a physical point of view and introduced into the modeling through operators and systems. The achieved models are adapted and used for the synthesis of classical (PID…) and advanced control schemes and laws. Another important aim of the control part in this book is the feed forward control which is of great interest for linearization and for damping vibration or for performances improvement when no sensor is available for feedback.

Features
► A rigorous modeling and understanding of the behaviour of the analyzed materials, from linear to nonlinear characteristics ► Efficient control design and applications for the improvement of performance ► Efficient measurement and estimation techniques for the actuators

Contents

Fields of interest
Nanotechnology and Microengineering

Target groups
Research

Discount group
Professional Non-Medical

Available
2012. XII, 532 p. (Smart Innovation, Systems and Technologies, Volume 17) Hardcover ► $229.00 ISBN 978-3-642-30170-4

Available

Available
2013. X, 310 p. (Microtechnology and MEMS) Hardcover ► approx. $179.00 ISBN 978-3-642-24045-4
Circuit Design for Reliability

This book presents physical understanding, modeling and simulation, on-chip characterization, layout solutions, and design techniques that are effective to enhance the reliability of various circuit units.

Features
- Provides comprehensive review on various reliability mechanisms at sub-45nm nodes
- Describes practical modeling and characterization techniques for reliability
- Includes thorough presentation of robust design techniques for major VLSI design units
- Promotes physical understanding with first-principle simulations

Contents

Fields of interests
Circuits and Systems; Quality Control, Reliability, Safety and Risk; Computer-Aided Engineering (CAD, CAE) and Design

Target groups
Research

Discount group
Professional Non-Medical

Remote Sensing Digital Image Analysis

An Introduction

Remote Sensing Digital Image Analysis provides the non-specialist with an introduction to quantitative evaluation of satellite and aircraft derived remotely retrieved data. Since the first edition of the book there have been significant developments in the algorithms used for the processing and analysis of remote sensing imagery; nevertheless many of the fundamentals have substantially remained the same. This new edition presents material that has retained value since those early days, along with new techniques that can be incorporated into an operational framework for the analysis of remote sensing data.

Features
- Comprehensive treatment of the entire spectrum of acquisition, analysis and processing of remotely sensed data
- Completely revised and enlarged to reflect new developments in the field
- Problems are given at the end of each chapter

Contents
Sources and characteristics of remote sensing image data.- Correcting and registering images.- Interpreting images.- Radiometric enhancement of images.- Geometric processing and enhancement: image domain techniques.- Spectral domain image transforms.- Spatial domain image transforms.- Supervised classification techniques.- Clustering and unsupervised classification.- Feature Reduction.- Image Classification in Practice.- Multisource Image Analysis.

Fields of interests
Signal/Image and Speech Processing; Geotechnical Engineering & Applied Earth Sciences; Remote Sensing/Photogrammetry

Target groups
Research

Discount group
Professional Non-Medical

On Statistical Pattern Recognition in Independent Component Analysis Mixture Modelling

A natural evolution of statistical signal processing, in connection with the progressive increase in computational power, has been exploiting higher-order information. Thus, high-order spectral analysis and nonlinear adaptive filtering have received the attention of many researchers.

Features
- Nominated as outstanding PhD by the Polytechnic University of Valencia
- Present an excellent state-of-the-art literature review of the main applied theoretical foundations of statistical pattern recognition
- Gives new insights into independent component analysis (ICA) and independent component analysis mixture modelling (ICAMM) research in the context of statistical pattern recognition
- Defines a novel general framework in statistical pattern recognition based on independent component analysis mixture modelling

Contents

Fields of interests
Complexity; Computer Imaging, Vision, Pattern Recognition and Graphics; Signal/Image and Speech Processing

Target groups
Research

Discount group
Professional Non-Medical

Due July 2012

2012. 300 p. Hardcover

$129.00


Available


$99.00

ISBN 978-3-642-30061-5

Available

2012. XXIII, 174 p. 73 illus. (Springer Theses, Volume 4) Hardcover

$129.00

ISBN 978-3-642-30751-5

Professional Non-Medical Discount group

Research

Professional Non-Medical

Professional Non-Medical Discount group

Research
Multiple Fuzzy Classification Systems

Fuzzy classifiers are important tools in exploratory data analysis, which is a vital set of methods used in various engineering, scientific, and business applications. Fuzzy classifiers use fuzzy rules and do not require assumptions common to statistical classification. Rough set theory is useful when data sets are incomplete. It defines a formal approximation of crisp sets by providing the lower and the upper approximation of the original set. Systems based on rough sets have natural ability to work on such data and incomplete vectors do not have to be preprocessed before classification. To achieve better performance than existing machine learning systems, fuzzy classifiers and rough sets can be combined in ensembles. Such ensembles consist of a finite set of learning models, usually weak learners. The present book discusses the three aforementioned fields – fuzzy systems, rough sets and ensemble techniques.

Features
► Novel approach for exploratory data analysis with ensembles of various neuro-fuzzy systems
► Derivation of various ensemble architectures that are able to work with missing data
► Written by an expert in this field

Contents
Introduction to fuzzy systems.- Ensemble techniques.- Relational modular fuzzy systems.- Ensembles of the Mamdani fuzzy systems.- Logical type fuzzy systems.- Takagi-Sugeno fuzzy systems.- Rough–neuro–fuzzy Ensembles for Classification with Missing Data.- Concluding remarks and challenges for future research.

Fields of interests
Computational Intelligence; Pattern Recognition; Simulation and Modeling

Target groups
Research

Discount group
Professional Non-Medical

Modeling and Control of a Large Nuclear Reactor

A Three-Time-Scale Approach

Control analysis and design of large nuclear reactors requires a suitable mathematical model representing the steady state and dynamic behavior of the reactor with reasonable accuracy. This task is, however, quite challenging because of several complex dynamic phenomena existing in a reactor. Quite often, the models developed would be of prohibitively large order, non-linear and of complex structure not readily amenable for control studies. Moreover, the existence of simultaneously occurring dynamic variations at different speeds makes the mathematical model susceptible to numerical ill-conditioning, inhibiting direct application of standard control techniques.

Features
► Recent research on Modeling and Control of a Large Nuclear Reactor
► Presents a three-time-scale approach
► Written by leading experts in the field

Contents

Fields of interests
Control; Nuclear Engineering

Target groups
Research

Discount group
Professional Non-Medical

Rough Sets and Intelligent Systems - Professor Zdzisław Pawlak in Memoriam

Volume 1

Features
► Dedicated to the memory of Professor Zdzisław Pawlak, the founder of the Polish school of Artificial Intelligence and one of the pioneers in Computer Engineering and Computer Science with worldwide influence
► This book prepared in two volumes contains more than 50 chapters
► Demonstrates that the scientific approaches discovered by Professor Zdzisław Pawlak, especially the rough set approach as a tool for dealing with imperfect knowledge, are vivid and intensively explored by leading researchers worldwide

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

Available
► $129.00
ISBN 978-3-642-30603-7

Available
2012. XII, 132 p. (Lecture Notes in Control and Information Sciences, Volume 431) Softcover
► $109.00
ISBN 978-3-642-30588-7

Available
► approx. $239.00
ISBN 978-3-642-30343-2
Hybrid Metaheuristics

The main goal of this book is to provide a state of the art of hybrid metaheuristics. The book provides a complete background that enables readers to design and implement hybrid metaheuristics to solve complex optimization problems (continuous/discrete, mono-objective/multi-objective, optimization under uncertainty) in a diverse range of application domains. Readers learn to solve large scale problems quickly and efficiently combining metaheuristics with complementary metaheuristics, mathematical programming, constraint programming and machine learning. Numerous real-world examples of problems and solutions demonstrate how hybrid metaheuristics are applied in such fields as networks, logistics and transportation, bio-medical, engineering design, scheduling.

Contents
Part I Hybrid metaheuristics for mono and multi-objective optimization, and optimization under uncertainty.
Part II Combining metaheuristics with (complementary) metaheuristics.
Part III Combining metaheuristics with exact methods from mathematical programming approaches.
Part IV Combining metaheuristics with constraint programming approaches.
Part V Combining metaheuristics with machine learning and data mining techniques.

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

Available
2012. XII, 464 p. (Studies in Computational Intelligence, Volume 434) Hardcover
$229.00
ISBN 978-3-642-30670-9

"Rough Sets and Intelligent Systems - Professor Zdzisław Pawlak in Memoriam" Volume 2

A. Skowron, University of Warsaw, Poland; Z. Suraj, University of Rzeszów, Poland (Eds)

This book is dedicated to the memory of Professor Zdzisław Pawlak who passed away almost six years ago.

Features
Dedicated to the memory of Professor Zdzisław Pawlak, the founder of the Polish school of Artificial Intelligence and one of the pioneers in Computer Engineering and Computer Science with worldwide influence. This book prepared in two volumes contains more than 50 chapters. Demonstrates that the scientific approaches discovered by Professor Zdzisław Pawlak, especially the rough set approach as a tool for dealing with imperfect knowledge, are vivid and intensively explored by leading researchers worldwide.

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
Professional Non-Medical

Available other books from SCI
2012. XII, 604 p. (Intelligent Systems Reference Library, Volume 43) Hardcover
$229.00
ISBN 978-3-642-30340-1

"On Orbit and Beyond: Psychological Perspectives on Human Spaceflight"

E.-G. Talbi, University of Lille 1, Villeneuve d'Ascq, France (Ed)

On Orbit and Beyond
Psychological Perspectives on Human Spaceflight

Contents

Fields of interests
Aerospace Technology and Astronautics; Personality and Social Psychology; Extraterrestrial Physics, Space Sciences

Target groups
Research

Discount group
Professional Non-Medical

Available
2013. Approx. 270 p. 20 illus. (Space Technology Library, Volume 29) Hardcover
approx. $139.00
ISBN 978-3-642-30582-5

D. A. Vakoch, SETI Institute, Mountain View, CA, USA (Ed)
CMOS Integrated Capacitive DC-DC Converters

This book provides a detailed analysis of all aspects of capacitive DC-DC converter design: topology selection, control loop design and noise mitigation. Readers will benefit from the authors’ systematic overview that starts from the ground up, in-depth circuit analysis and a thorough review of recently proposed techniques and design methodologies. Not only design techniques are discussed, but also implementation in CMOS is shown, by pinpointing the technological opportunities of CMOS and demonstrating the implementation based on four state-of-the-art prototypes.

Features
► Provides a detailed analysis of all aspects of capacitive DC-DC converter design ► Analyzes the potential of this type of DC-DC converter and introduces a number of techniques to unleash their full potential ► Combines system theory with practical implementation techniques ► Includes unique analysis of CMOS technology for this application ► Provides in-depth analysis of four fabricated prototypes

Contents

Fields of interests
Circuits and Systems; Electronics and Microelectronics; Instrumentation; Power Electronics; Electrical Machines and Networks

Target groups
Research

Discount group
Professional Non-Medical

Rocketing Into the Future
The History and Technology of Rocket Planes

This book describes the technology, history, and future of rocket planes. Michel van Pelt journeys into this exciting world, examining the exotic concepts and actual flying vehicles that have been devised over the last hundred years. He recounts the history of rocket airplanes, from the early pioneers who attached simple rockets onto their wooden glider airplanes to the modern world of high-tech research vehicles.

Features
► Presents the technical as well as economic challenges related to spaceplane development ► Looks at rocket planes in fiction and popular culture and discusses how realistic these have been in terms of design, size, performance, and maneuverability in space ► Describes in an engaging and clear way how rockets and aircraft work while pointing out the most important features of today’s advanced rocket planes

Contents
Illustrations.- Author’s preface.- Chapter 1: Introduction.- Chapter 2: A crash course in rocket plane design.- Chapter 3: Germany’s wonder weapons.- Chapter 4: Non-German wartime rocket fighters.- Chapter 5: The rise and fall of the rocket interceptor.- Chapter 6: Breaking the barrier.- Chapter 7: Rocket plane spaceflight.- Chapter 8: Future spaceplanes.- Chapter 9: Joyriding a rocket plane.- Chapter 10: Man versus robot.- Chapter 11: Conclusions.- Appendix: Aircraft maximum velocity and altitude evolution.- Bibliography.- Index.

Fields of interests
Aerospace Technology and Astronautics; Popular Science in Astronomy; Extraterrestrial Physics, Space Sciences

Target groups
Popular/general

Discount group
Professional Non-Medical

A Rapid Introduction to Adaptive Filtering

In this book, the authors provide insights into the basics of adaptive filtering, which are particularly useful for students taking their first steps into this field. They start by studying the problem of minimum mean-square-error filtering, i.e., Wiener filtering. Then, they analyze iterative methods for solving the optimization problem, e.g., the Method of Steepest Descent. By proposing stochastic approximations, several basic adaptive algorithms are derived, including Least Mean Squares (LMS), Normalized Least Mean Squares (NLMS) and Sign-error algorithms. The authors provide a general framework to study the stability and steady-state performance of these algorithms. The affine Projection Algorithm (APA) which provides faster convergence at the expense of computational complexity (although fast implementations can be used) is also presented.

Features
► Presents a rapid introduction to the fundamentals on adaptive filtering ► Discusses several modern topics in the adaptive filtering field

Contents
Wiener Filtering and examples.- Steepest descent procedure.- Stochastic gradient adaptive filtering: LMS (Least Mean Squares), NLMS (Normalized Mean Squares).- Sign-error algorithm, APA (Affine Projection Algorithms).- Convergence results.- Applications.- LMS (Least Squares) and RLS (Recursive Least Squares).- Computational complexity and fast implementations.- Applications.

Fields of interests
Signal, Image and Speech Processing; Artificial Intelligence (incl. Robotics); Computational Intelligence

Target groups
Professional/practitioner

Discount group
Professional Non-Medical
Fast Solar Sailing

Astrodynamics of Special Sailcraft Trajectories

The range of solar sailing is very vast; it is a fully in-space means of propulsion that should allow us to accomplish various mission classes that are literally impossible using rocket propulsion, no matter if nuclear or electric. Fast and very fast solar sailings are special classes of sailcraft missions, initially developed only in the first half of the 1990s and still evolving, especially after the latest advances in nanotechnology.

Features

- This is the first full mathematical (and technological) monograph devoted to Fast Solar Sailing.
- Educates the next generation of aerospace engineers on a revolutionary new engineering reality they can use for future deep space missions.

Contents


Fields of interests

Aerospace Technology and Astronautics; Extraterrestrial Physics, Space Sciences; Numerical and Computational Physics.

Target groups

Research.

Discount group

Professional Non-Medical.

High Performance CMOS Transmitters for Wireless Communications

The demand for wireless technology has dramatically increased in recent years. Wireless communications has not only allowed for increased portability for voice and data communications but has also facilitated the deployment of systems in which wires are either too difficult or costly to install. Two fundamental forces have largely fueled this demand: the desire for information and the advancement of technology. Despite the improvement of the underlying integrated circuit technology, high performance transmitters typically use a number of discrete components and several integrated circuits because they employ multiple device technologies. High Performance CMOS Transmitters for Wireless Communications describes advancements at both the circuit and architectural levels which allow the construction of a single-chip CMOS transmitter while enabling high performance and the ability to operate with multiple radio frequency standards.

Features

- Presents detailed information about a novel mixer.
- Presents detailed information about RF transmitter design.
- Practical solutions to complex problems faced by radio designers.

Contents


Fields of interests

Circuits and Systems; Communications Engineering, Networks; Electronics and Microelectronics, Instrumentation.

Target groups

Research.

Discount group

Professional Non-Medical.

Precision Instrumentation Amplifiers and Read-Out Integrated Circuits

This book presents innovative solutions in the design of precision instrumentation amplifier and read-out ICs, which can be used to boost millivolt-level signals transmitted by modern sensors, to levels compatible with the input ranges of typical Analog-to-Digital Converters (ADCs).

Features

- Surveys comprehensively offset cancellation and accuracy improvement techniques applied in precision amplifier design.
- Presents techniques in precision circuit design to mitigate low frequency errors in millivolt-level signals transmitted by modern sensors to analog-to-digital converters.
- Describes design of two stand-alone precision instrumentation amplifiers to drive an external ADC.
- Describes design of a read-out IC combining the instrumentation amplifier and the ADC into one chip.

Contents


Fields of interests

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Signal, Image and Speech Processing.

Target groups

Research.

Discount group

Professional Non-Medical.

Additional information:

Available

2012. 463 p. (Space Technology Library, Volume 30) Hardcover
- approx. $189.00
ISBN 978-94-007-4776-0

Available

- $129.00

Due July 2012

- $129.00
Control of Surge in Centrifugal Compressors by Active Magnetic Bearings

Theory and Implementation

Surge Control of Active-magnetic-bearing-suspended Centrifugal Compressors sets out the fundamentals of integrating active magnetic bearing (AMB) rotor suspension technology in compressor systems, and describes how this relatively new bearing technology can be employed in active control of compressor surge initiation. The authors provide a self-contained and comprehensive review of rotordynamics and the fundamentals of AMB technology.

Feature

- Shows how active magnetic bearings can be used for smoother, more reliable control of compressor systems essential in many modern manufacturing processes. Reports active surge control methods that will reduce mechanical damage to equipment with less cost to performance ideas. Are given practical demonstration in a specially-built, industry-sized test system.

Contents


Fields of interests

Control; Aerospace Technology and Astronautics; Energy Storage

Target groups

Research

Discount group

Professional Non-Medical

Handbook of Optimization

From Classical to Modern Approach

Optimization problems were and still are the focus of mathematics from antiquity to the present. Since the beginning of our civilization, the human race has had to confront numerous technological challenges, such as finding the optimal solution of various problems including control technologies, power sources construction, applications in economy, mechanical engineering and energy distribution amongst others. These examples encompass both ancient as well as modern technologies like the first electrical energy distribution network in USA etc. Some of the key principles formulated in the middle ages were done by Johannes Kepler (Problem of the wine barrels), Johan Bernoulli (brachystochrone problem), Leonhard Euler (Calculus of Variations), Lagrange (Principle multipliers), that were formulated primarily in the ancient world and are of a geometric nature. In the beginning of the modern era, works of L.V. Kantorovich and G.B.

Features

- Self contained handbook covering the complete field of optimization.
- Covers classical as well as the modern approaches.
- Written by leading experts.

Contents


Fields of interests

Computational Intelligence; Artificial Intelligence (incl. Robotics); Operation Research/Decision Theory

Target groups

Research

Discount group

Professional Non-Medical

3D-TV System with Depth-Image-Based Rendering

Architectures, Techniques and Challenges

Contents


Fields of interests

Signal, Image and Speech Processing; Image Processing and Computer Vision; Multimedia Information Systems

Target groups

Research

Discount group

Professional Non-Medical

Available

2013. XX, 285 p. 135 illus., 10 in color. (Advances in Industrial Control) Hardcover

$179.00


News 6/2012

C. Zhu, Nagoya University, Japan; Y. Zhao, Zhejiang University, Hangzhou, China; M. Tanimoto, Nagoya University, Nagoya, Japan (Eds)

3D-TV System with Depth-Image-Based Rendering

Architectures, Techniques and Challenges

Contents


Fields of interests

Signal, Image and Speech Processing; Image Processing and Computer Vision; Multimedia Information Systems

Target groups

Research

Discount group

Professional Non-Medical

Available

2012. XII, 1110 p. (Intelligent Systems Reference Library, Volume 38) Hardcover

$279.00

ISBN 978-3-642-30503-0

Due July 2012

2012. X, 474 p. 230 illus., 56 in color. Hardcover

$179.95

ISBN 978-1-4419-9963-4