Lee de Forest
King of Radio, Television, and Film
The life-long inventor, Lee de Forest invented the three-element vacuum tube used between 1906 and 1916 as a detector, amplifier, and oscillator of radio waves. Beginning in 1918 he began to develop a light valve, a device for writing and reading sound using light patterns. While he received many patents for his process, he was initially ignored by the film industry. In order to promote and demonstrate his process he made several hundred sound short films, he rented space for their showing; he sold the tickets and did the publicity to gain audiences for his invention. Lee de Forest officially brought sound to film in 1919.

Lee De Forest: King of Radio, Television, and Film
Lee de Forest
M. Adams, San Jose State University, CA, USA

Low Power Design with High-Level Power Estimation and Power-Aware Synthesis
This book presents novel research techniques, algorithms, methodologies and experimental results for high level power estimation and power aware high-level synthesis. Readers will learn to apply such techniques to enable design flows resulting in shorter time to market and successful low power ASIC/FPGA design.

Features
► Integrates power estimation and reduction for high level synthesis, with low-power, high-level design ► Shows specific techniques for ASICs as well as FPGA based SoC designs, allowing readers to evaluate and explore various possible alternatives ► Covers techniques from RTL/gate-level to hardware software co-design

Contents

Fields of interest
Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

Target groups
Research

Discount group
P

Aerospace Engineering on the Back of an Envelope
Engineers need to acquire “Back-of-the-Envelope” survival skills to obtain rough quantitative answers to real-world problems, particularly when working on projects with enormous complexity and very limited resources. In the case studies treated in this book, we show step-by-step examples of the physical arguments and the resulting calculations obtained using the quick-fire method. We also demonstrate the estimation improvements that can be obtained through the use of more detailed physics-based Back-of-the-Envelope engineering models. These different methods are used to obtain the solutions to a number of design and performance estimation problems arising from two of the most complex real-world engineering projects: the Space Shuttle and the Hubble Space Telescope satellite.

Features
► Shows how to very quickly estimate solutions for complex problems Puts the focus on real world problems ► Includes many examples of actual problems like the Space Shuttle and the Hubble Telescope ► Useful as a basic resource tool and set of skill for practitioners and students Assists in developing quick tests of new design concepts

Contents

Fields of interest
Aerospace Technology and Astronautics; Engineering Design; Extraterrestrial Physics, Space Sciences

Target groups
Professional/practitioner

Discount group
P

Discount group
T
Fractional Dynamics and Control

Contents

Fields of interest
Vibration, Dynamical Systems, Control; Complexity; Computational Science and Engineering

Target groups
Research

Discount group
P

Conversion of Coal-Fired Power Plants to Cogeneration and Combined-Cycle
Thermal and Economic Effectiveness

Contents

Fields of interest
Energy Technology; Fossil Fuels (incl. Carbon Capture); Thermodynamics

Target groups
Research

Discount group
P

Handbook of Digital Homecare
Successes and Failures

Contents
A high road to Dutch healthcare reform.- The Epilepsy Project in the Republic of Ireland: Lessons for Digital Homecare.- Care TV to support care delivery to independently living seniors.- Establishing an infrastructure for tele-care: combining the socio-technical and the clinical.- Screening and monitoring of elderly population for teleophthalmology in rural areas in.- Implementation of Mobile Computing in Canadian Homecare Programs: Project Risk Management and its Influence on Project Success.- AAL+: Continuous Institutional and Home Care Through Wireless Biosignal Monitoring Systems.- Home medication management by videophone; translation from pilot project to integrated service.- The introduction of activity monitoring as part of care delivery to independently living seniors.- The SAPHIRE Project: A Retrospective View on the Homecare Scenario.- An Intelligent Multi-Agent Memory.- About motivated project teams, user expectations, proof-of-concept testing and the after-a-good-project-hang-over.

Fields of interest
Biomedical Engineering; Computer Appl. in Social and Behavioral Sciences; Health Informatics

Target groups
Research

Discount group
P
Integrative Production Technology for High-Wage Countries

Industrial production in high-wage countries like Germany is still at risk. Yet, there are many counter-examples in which producing companies dominate their competitors by not only compensating for their specific disadvantages in terms of factor costs (e.g. wages, energy, duties and taxes) but rather by minimising waste using synchronising integrativity as well as by obtaining superior adaptivity on alternating conditions. In order to respond to the issue of economic sustainability of industrial production in high-wage countries, the leading production engineering and material research scientists of RWTH Aachen University together with renowned companies have established the Cluster of Excellence "Integrative Production Technology for High-Wage Countries".

Features
► Integrativity as a key factor of success for manufacturing companies in high-wage countries
► Interdisciplinary research results in production and materials science ► Impressive implementation of scientific results into industrial practice

Contents
Introduction.- Integrative Production Technology for High-Wage Countries.- Individualised production.- Virtual production systems.- Hybrid production systems.- Self-optimising production systems.- Integrative Business- and Technology Cases.- Subject index.

Fields of interest
Industrial and Production Engineering; Production/Logistics/Supply Chain Management; Sustainable Development

Target groups
Professional/practitioner

Discount group
P

Possibility for Decision
A Possibilistic Approach to Real Life Decisions

This book starts with the basic concepts of fuzzy sets and progresses through a normative view on possibility distributions and OWA operators in multiple criteria decisions. Five applications (that all build on experience from solving complex real world problems) of possibility distributions to strategic decisions about closing/not closing a production plant using fuzzy real options, portfolio selection with imprecise future data, predictive probabilities and possibilities for risk assessment in grid computing, fuzzy ontologies for process industry, and design (and implementation) of mobile value services are presented and carefully discussed. It can be useful for researchers and students working in soft computing, real options, fuzzy decision making, grid computing, knowledge mobilization and mobile value services.

Features
► Advanced research on possibility distributions and decisions ► Application of fuzzy logic, probability and possibility theory ► Written by leading experts in the field

Contents

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

Target groups
Research

Discount group
P

Average Time Complexity of Decision Trees

Decision tree is a widely used form of representing algorithms and knowledge. Compact data models and fast algorithms require optimization of tree complexity. This book is a research monograph on average time complexity of decision trees. It generalizes several known results and considers a number of new problems. The book contains exact and approximate algorithms for decision tree optimization, and bounds on minimum average time complexity of decision trees. Methods of combinatorics, probability theory and complexity theory are used in the proofs as well as concepts from various branches of discrete mathematics and computer science.

Features
► Studies average time complexity of decision trees ► over finite and infinite sets of attributes ► Contains exact and approximate algorithms for decision tree optimization ► Written by a leading expert in the field

Contents

Fields of interest
Computational Intelligence; Artificial Intelligence
Machining of Metal Matrix Composites

Machining of Metal Matrix Composites provides the fundamentals and recent advances in the study of machining of metal matrix composites (MMCs). Each chapter is written by an international expert in this important field of research. Machining of Metal Matrix Composites gives the reader information on machining of MMCs with a special emphasis on aluminium matrix composites. Chapter 1 provides the mechanics and modelling of chip formation for traditional machining processes. Chapter 2 is dedicated to surface integrity when machining MMCs. Chapter 3 describes the machinability aspects of MMCs. Chapter 4 contains information on traditional machining processes and Chapter 5 is dedicated to the grinding of MMCs.

Features
► Provides the fundamentals and recent advances in the study of machining of MMCs
► Contains chapters written by international experts
► Enriched by many figures and diagrams that add yet more practical details

Contents
1. Mechanics and Modeling of Chip Formation in Machining of MMCs
2. Surface Integrity When Machining Metal Matrix Composites
3. Machinability Aspects of Metal Matrix Composites
4. Traditional Machining Processes of MMCs
5. Grinding of Metal Matrix Composites
6. Dry Cutting of SiC Particulates Reinforced Metal Matrix Composites
7. Computational Methods and Optimization of Metal Matrix Composites

Fields of interest
Manufacturing, Machines, Tools; Machinology and Machine Elements; Ceramics, Glass, Composites, Natural Materials

Target groups
Research

Discount group
P

Control Technologies for Emerging Micro and Nanoscale Systems

This book comprises a selection of the presentations made at the "Workshop on Dynamics and Control of Micro and Nanoscale Systems" held at IBM Research – Zurich, Switzerland, on the 10th and 11th of December 2009. The aim of the workshop was to bring together some of the leading researchers in the field of dynamics and control of micro- and nanoscale systems. It proved an excellent forum for discussing new ideas and approaches.

Features
► Recent research in Control Technologies for Emerging Micro and Nanoscale Systems
► Based on a high-level workshop entitled "Workshop on Dynamics and Control of Micro and Nanoscale Systems" held in Zurich, Switzerland, on 10th and 11th of December 2009
► Written by leading experts in this field

Contents

Fields of interest
Control; Nanotechnology and Microengineering; Systems Theory, Control

Target groups
Research

Discount group
P
Electronic Tap-changer for Distribution Transformers

This reference collects all relevant aspects electronic tap-changer and presents them in a comprehensive and orderly manner. It explains logically and systematically the design and optimization of a full electronic tap-changer for distribution transformers. The book provides a fully new insight to all possible structures of power section design and categorizes them comprehensively, including cost factors of the design. In the control section design, the authors review mechanical tap-changer control systems and they present the modeling of a full electronic tap-changer as well as a closed-loop control of the full-electronic tap-changer. The book is written for electrical engineers in industry and academia but should be useful also to postgraduate students of electrical engineering.

Features
► Collects all relevant aspects and presents them comprehensively  ► Includes a cost factor functions of the design process  ► Written for electrical engineers in industry and academia

Contents

Fields of interest
Power Electronics, Electrical Machines and Networks

Target groups
Research

Discount group
P

M. N. Fardis, University of Patras, Greece (Ed.)

Innovative Materials and Techniques in Concrete Construction

ACES Workshop

Contents

Fields of interest
Civil Engineering; Structural Mechanics; Building Materials

Target groups
Research

Discount group
P

M. N. Fardis, University of Patras, Greece; Z. T. Rakicevic, Institute of Earthquake Engineering and Seismology (IZIIS), Skopje, Macedonia (Eds.)

Role of Seismic Testing Facilities in Performance-Based Earthquake Engineering

SERIES Workshop

Contents

Fields of interest
Civil Engineering; Structural Mechanics; Geotechnical Engineering

Target groups
Research

Discount group
P

Available
2011. XII, 183 p. 158 illus. (Power Systems, Volume 2)
Hardcover
► $179.00
ISBN 978-3-642-19910-3

Due November 2011
2012. XI, 477 p. 288 illus., 166 in color. Hardcover
► $179.00

Due November 2011
2012. XVIII, 390 p. 167 illus., 102 in color. (Geotechnical, Geological and Earthquake Engineering, Volume 22)
Hardcover
► $179.00
Methods and Tastes in Modern Continuum Mechanics
To the Memory of Donald E. Carlson

Contents

Fields of interest
Continuum Mechanics and Mechanics of Materials; Classical Continuum Physics; Mathematical Modeling and Mathematics in Industry

Discount group
P

L. Fridman, J. Moreno, R. Iriarte, Universidad Nacional Autonoma de Mexico, Mexico City, Mexico (Eds.)

Sliding Modes after the first Decade of the 21st Century
State of the Art
The book presents the newest results of the major world research groups working in the area of Variable Structure Systems and Sliding Mode Control (VSS/SMC). The research activity of these groups is coordinated by the IEEE Technical Committee on Variable Structure Systems (VSS) and Sliding Modes (SM). The presented results include the reports of the research groups collaborating in a framework of the Unión Europea – México project of Fondo de Cooperación Internacional en Ciencia y Tecnología (FONCICYT) 93302 titled “Automatización y Monitoring of Energy Production Processes via Sliding Mode Control”.

Features
► Recent research on Computational Intelligence for Privacy and Security Recent leading research in sliding modes ► Presents a report of 21 main research groups working on the field of Variable Structure Systems and Sliding Mode Control throughout the world ► Written by leading experts in the field

Contents

Fields of interest
Control; Systems Theory, Control

Target groups
Research

Discount group
P

B. Fu, Marvell Semiconductor, Inc., Santa Clara, CA, USA; P. Ampadu, University of Rochester, NY, USA

Error Control for Network-on-Chip Links
This book provides readers with a comprehensive review of the state of the art in error control for Network on Chip (NOC) links. Coverage includes detailed description of key issues in NOC error control faced by circuit and system designers, as well as practical error control techniques to minimize the impact of these errors on system performance.

Features
► Provides a detailed background on the state of error control methods for on-chip interconnects, including Error Control Coding, Double Sampling, and On-Line Testing ► Describes the use of more complex concatenated codes such as Hamming Product Codes with Type-II HARQ, while emphasizing integration techniques for on-chip interconnect links ► Presents techniques for managing intermittent and permanent errors using a non-interrupting in-line test method with spare wire replacement ► Examines energy-efficient techniques for integrating multiple error control methods in on-chip interconnects

Contents
Introduction.- Solutions to Improve the Reliability of On-Chip Interconnects.- Networks-on-Chip (NoC).- Error Control Coding for On-Chip Interconnects.- Energy Efficient Error Control Implementation.- Combining Error Control Codes with Crosstalk Reduction.

Fields of interest
Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design

Target groups
Research

Discount group
P
Contemporary Methods for Speech Parameterization

Contemporary Methods for Speech Parameterization offers a general view of short-time cepstrum-based speech parameterization and provides a common ground for further in-depth studies on the subject. Specifically, it offers a comprehensive description, comparative analysis, and empirical performance evaluation of eleven contemporary speech parameterization methods, which compute short-time cepstrum-based speech features.

Among these are five discrete wavelet packet transform (DWPT)-based, six discrete Fourier transform (DFT)-based speech features and some of their variants which have been used on the speech recognition, speaker recognition, and other related speech processing tasks. The main similarities and differences in their computation are discussed and empirical results from performance evaluation in common experimental conditions are presented.

Features
- Provides numerous illustrations and comparative descriptions, which facilitate understanding of the properties and range of applicability of each speech parameterization technique

Contents
Basic Concepts and Applicability of Speech Parameterization.- Survey on speech parameterization.- Fourier transform based methods.- Wavelet packets based methods.- Evaluation on the speech recognition task.- Evaluation on the speaker recognition task.- Practical considerations.- Links to code and further sources of information.

Fields of interest
Signal, Image and Speech Processing; Language Translation and Linguistics; User Interfaces and Human Computer Interaction

Target groups
Research

Discount group
P

Network Reliability and Resilience

This book is devoted to the probabilistic description of the behavior of a network in the process of random removal of its components (links, nodes) appearing as a result of technical failures, natural disasters or intentional attacks. It is focused on a practical approach to network reliability and resilience evaluation, based on applications of Monte Carlo methodology to numerical approximation of network combinatorial invariants, including so-called multidimensional destruction spectra. This allows to develop a probabilistic follow-up analysis of the network in the process of its gradual destruction, to identify most important network components and to develop efficient heuristic algorithms for network optimal design. Our methodology works with satisfactory accuracy and efficiency for most applications of reliability theory to real–life problems in networks.

Features
- Introduces a new educational approach using only one-dimensional elements
- Uses intuitive mathematics and is scientifically exact
- Describes also advanced problems like composite materials and nonlinear elasticity

Contents
Theory.- Applications.

Fields of interest
Communications Engineering, Networks; Computer Systems Organization and Communication Networks; Quality Control, Reliability, Safety and Risk

Target groups
Research

Discount group
P

Gas Hydrates

Immense Energy Potential and Environmental Challenges

Gas hydrates are both a huge energy resource and an environmental challenge. They have a significant impact on society because of their applications to the future of energy, protection of the environment and fuel transportation. Gas Hydrates opens up this fascinating, multidisciplinary field to non-specialists. It provides a scientific study of gas hydrates that considers their potential as an energy source while assessing the possible risk to the environment. The authors also examine the feasibility of using these natural compounds for storing and transporting gases such as methane and carbon dioxide. Diagrams and photos are used throughout Gas Hydrates to help readers understand the scientific and technical content.

Features
- Includes diagrams, photos and coloured sketches
- Contains chapters that are independent from each other so they can be read and understood separately
- Written in a clear and accessible style

Contents

Fields of interest
Renewable Energy Sources; Renewable and Green Energy; Sustainable Development

Target groups
Professional/practitioner

Discount group
P
Soft Computing in Green and Renewable Energy Systems

Soft Computing in Green and Renewable Energy Systems provides a practical introduction to the application of soft computing techniques and hybrid intelligent systems for designing, modeling, characterizing, optimizing, forecasting, and performance prediction of green and renewable energy systems. Research is proceeding at jet speed on renewable energy (energy derived from natural resources such as sunlight, wind, tides, rain, geothermal heat, biomass, hydrogen, etc.) as policy makers, researchers, economists, and world agencies have joined forces in finding alternative sustainable energy solutions to current critical environmental, economic, and social issues.

Features
- State-of-the-art applications of soft computing techniques to green and renewable energy systems
- Presents soft computing techniques and hybrid intelligent systems for designing, modeling, characterizing, optimizing, forecasting, and performance prediction of green and renewable energy systems
- Written by leading experts in the field

Contents

Fields of interest
Computational Intelligence; Renewable Energy Sources; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
P

Correction Formulae for the Stress Distribution in Round Tensile Specimens at Neck Presence

The monograph deals with methods to determine mechanical properties and evaluate the flow curve of ductile materials from the tensile test. It presents classical hypotheses concerning the onset of neck creation as well as the state of the art in determining the mechanical properties from the tensile test, with emphasis on the consequences of the neck formation. It revises derivations of formulae for the stress distribution in the minimal cross-section of the axisymmetric specimen in the classical approaches proposed by Bridgman, Davidenkov / Spiridonova and Siebel as well as in the less famous formulae derived by Szczepinski and Malinin / Petrosjan. The revision is completed with solutions evaluated by the authors. In the monograph, the simplifying assumptions utilised in the classical approaches were carefully verified by numerical simulations accompanied by theoretical analysis. Errors imposed in the evaluation of the average axial stress acting on the minimal cross-section as a result of every particular simplification are estimated. The accuracy of all formulae to evaluate the flow curve is discussed.

Features
- Presents methods to determine mechanical properties and evaluate the flow curve of ductile materials
- Revises classical hypotheses concerning the onset of neck creation and completes them with new solutions

Fields of interest
Continuum Mechanics and Mechanics of Materials; Computational Science and Engineering; Characterization and Evaluation of Materials

Target groups
Research

Discount group
P

Automation in Warehouse Development

Features
- Addresses a higher level of automation in distribution centres/warehouses and the development of such logistic systems
- Covers a large part of warehouse development including robotic components for material handling, system analysis and design, and system-level control
- Describes how academic research can be applied to reduce the industrial challenge of designing complex logistic systems

Contents

Fields of interest
Engineering Economics, Organization, Logistics, Marketing; Robotics and Automation; Production/Logistics/Supply Chain Management

Target groups
Professional/practitioner

Discount group
P
Self-Learning Speaker Identification
A System for Enhanced Speech Recognition

Current speech recognition systems are based on speaker independent speech models and suffer from inter-speaker variations in speech signal characteristics. This work develops an integrated approach for speech and speaker recognition in order to gain space for self-learning opportunities of the system. This work introduces a reliable speaker identification which enables the speech recognizer to create robust speaker dependent models. In addition, this book gives a new approach to solve the reverse problem, how to improve speech recognition if speakers can be recognized. The speaker identification enables the speaker adaptation to adapt to different speakers which results in an optimal long-term adaptation.

Features
- Includes an overview on the state of art
- Gives an approach for In-Car Applications
- Written for professionals and practitioners in that field

Contents

Fields of interest
Signal, Image and Speech Processing; Biometrics; Communications Engineering, Networks

Target groups
Professional/practitioner

Discount group
P

Numerical Modeling of Concrete Cracking

The book presents the underlying theories of the different approaches for modeling cracking of concrete and provides a critical survey of the state-of-the-art in computational concrete mechanics.

Features
- Provides fundamental knowledge of the different approaches for modeling cracking of concrete
- Provides a critical surgery of the state-of-the-art in computational concrete mechanics
- Demonstrates the potentials of the different approaches for practical applications in civil engineering

Contents

Fields of interest
Building Materials; Computational Science and Engineering; Structural Materials

Target groups
Research

Discount group
P

Deterministic Solvers for the Boltzmann Transport Equation

The book covers all aspects from the expansion of the Boltzmann transport equation with harmonic functions to application to devices, where transport in the bulk and in inversion layers is considered. The important aspects of stabilization and band structure mapping are discussed in detail. This is done not only for the full band structure of the 3D k-space, but also for the warped band structure of the quasi 2D hole gas.

Features
- first book on deterministic Boltzmann solvers for semiconductor devices
- first comprehensive description of the required numerical methods
- describes very recent and significant advances in the field of deterministic Boltzmann solvers

Contents

Fields of interest
Electronics and Microelectronics, Instrumentation; Semiconductors; Optical and Electronic Materials

Target groups
Research

Discount group
P
CMOS High Efficiency On-chip Power Management

This book will introduce various power management integrated circuits (IC) design techniques to build future energy-efficient “green” electronics. The goal is to achieve high efficiency, which is essential to meet consumers’ growing need for longer battery lives. The focus is to study topologies amiable for full on-chip implementation (few external components) in the mainstream CMOS technology, which will reduce the physical size and the manufacturing cost of the devices.

Features
► Describes a number of techniques at circuits and systems level that increase sleep-mode efficiency to prolong the battery life, without sacrificing performance parameters. ► Enables readers to design for compactness, which requires fewer bulky external components and circuit topologies that lend themselves easily to full on-chip integration. ► Offers insights on how the efficiency boosting techniques for power management IC designs work toward society’s quest for higher energy efficiency

Contents

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

Target groups
Research

Discount group
P

Sliding Mode Based Analysis and Identification of Vehicle Dynamics

Vehicles are complex mechanical systems with strong nonlinear characteristics and which can present some uncertainties due to their dynamic parameters such as masses, inertias, suspension springs, tires side slip coefficients, etc. A vehicle is composed of many parts, namely the unsprung mass, the sprung mass, the suspension which makes the link between these two masses and therefore ensures passenger comfort, and also the pneumatic which absorbs the energy coming from the road and ensures contact between the vehicle and the road. In addition to its complexity and the presence of many nonlinearities and uncertainties, the presence of some external perturbations, such as the wind and the road inputs with its own characteristics (radius of curvature, longitudinal and lateral slop, road profile and skid resistance) can cause risks not only to the vehicle but also to passengers and other road users.

Features
► Recent research in Sliding Mode Based Analysis
► Presents applications to Control of Vehicle Dynamics
► Written by leading experts in the field

Contents
Introduction. - Observation and Identification via HOSM-Observers. - Vehicle Modeling. - States and Parameters Estimation. - Estimation of Road Profile and External Forces as Unknown Inputs. - Conclusions.

Fields of interest
Control; Automotive Engineering

Target groups
Research

Discount group
P

Advanced Dynamics and Model-Based Control of Structures and Machines

Contents

Fields of interest
Mechatronics; Theoretical and Applied Mechanics; Mechanical Engineering

Target groups
Research

Discount group
P
Biologically Inspired Approaches for Locomotion, Anomaly Detection and Reconfiguration for Walking Robots

The increasing presence of mobile robots in our everyday lives introduces the requirements for their intelligent and autonomous features. Therefore the next generation of mobile robots should be more self-capable, in respect to: increasing of their functionality in unforeseen situations, decreasing of the human involvement in their everyday operations and their maintenance; being robust; fault tolerant and reliable in their operation. Although mobile robotic systems have been a topic of research for decades and aside the technology improvements nowadays, the subject on how to program and making them more autonomous in their operations is still an open field for research.

Features
► Introduction of novel approaches for walking robots
► Using of biological inspired approaches to make robots autonomous and self-capable, i.e. having properties of self-reconfiguration, self-adaptation, self-optimization
► Written by leading experts in the field

Contents
From the content: Introduction.- Biologically inspired computing and self-x properties.- Joint leg walking and hybrid robot demonstrators.- Biologically inspired robot control architecture.- Biologically inspired approaches for locomotion of a hexapod robot OSCAR.

Fields of interest
Control, Robotics, Mechatronics; Robotics and Automation; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
P

K. D. Kihm, University of Tennessee, Knoxville TN, USA

Near-Field Characterization of Micro/Nano-Scaled Fluid Flows

Contents
Introduction.- Definitions of near-field.- Evanescent wave penetration depth.- Surface.- Photon penetration skin-depth into metal.- Penetration depth of no-slip boundary conditions.- Equilibrium height (hm) for small particles under near-field forces.- Total Internal Reflection Microscopy (TIRM).- Ratiometric TIRM imaging analysis.- Near-field applications of TIRM.- Near-wall hindered Brownian motion of nanoparticles.- Slip-flows in the near-field.- Cytoplasmic viscosity and intracellular vesicle sizes.- Optical Serial Sectioning Microscopy (OSSM).- Point spread functions (PSFs) under aberration-free design conditions.- Point spread functions (PSFs) under off-design conditions.- Principles of OSSM.- Near-field applications of OSSM.- Three-dimensional particle tracking velocimetry.- Dispersion of plasmon polaritons (SPPs).- Dispersion of SPPs.- Plasmon Resonance Microscopy (SPRM).- Surface plasmon resonance (SPR) reflectance.- Plasmon resonance (SPR) reflectance.

Fields of interest
Engineering Fluid Dynamics; Fluid- and Aerodynamics

Target groups
Research

Discount group
P

J. H. Kim, The Boeing Company, Seattle, WA, USA; M. J. Lee, City University of New York, NY, USA (Eds.)

Green IT: Technologies and Applications

This book is the first of its kind in presenting comprehensive technical issues and solutions for rapidly growing Green IT. It brings together in a single volume both green communications and green computing under the theme of Green IT, and presents exciting research and developments taking place therein in a survey style. Written by the subject matter experts consisting of an international team of recognized researchers and practitioners in the field, Green IT: Technologies and Applications will serve as an excellent source of information on the latest technical trend of Green IT for graduate/undergraduate students, researchers, engineers, and engineering managers in the IT (Electrical, Communications, Computer Engineering, Computer Science, Information Science) as well as interdisciplinary areas such as sustainability, environment, and energy.

Features
► Recent research in Green IT - categorized into Green computing, Green communications and Green regulations
► Focuses on technical aspects of Green IT in survey style
► Written by leading experts in the field

Contents
From the content: Evolving Communications Architectures: More Local is More Green.- Towards Green Wireless Communications: Metrics, Optimization and Tradeoff.- Energy-Aware Link Adaptation for a MIMO Enabled Cognitive System.- Energy Efficient MAC.

Fields of interest
Renewable Energy Sources; Appl.Mathematics/Computational Methods of Engineering; Renewable and Green Energy

Target groups
Research

Discount group
P
K. C. Le, Ruhr Universität Bochum, Germany

**Energy Methods in Dynamics**

The above examples should make clear the necessity of understanding the mechanism of vibrations and waves in order to control them in an optimal way. However vibrations and waves are governed by differential equations which require, as a rule, rather complicated mathematical methods for their analysis. The aim of this textbook is to help students acquire both a good grasp of the first principles from which the governing equations can be derived, and the adequate mathematical methods for their solving.

**Features**
- Gives insight into the mechanism of vibrations and waves in order to control them in an optimal way.
- Introduction to the systematic and intensive use of Hamilton’s variational principle and its generalizations for deriving the governing equations of conservative and dissipative mechanical systems.
- Presents the first principles from which the governing equations can be derived, and the adequate mathematical methods for their solving.
- Presents the direct variational-asymptotic analysis and how many well-known methods in dynamics like those of Lindstedt-Poincare, Bogoliubov-Mitropolsky, Kolmogorov-Arnold-Moser (KAM), and Witham can be derived from it.
- Written by leading experts in the field.

**Contents**
- Linear theory.
- Single oscillator.
- Coupled oscillator.
- Continuous oscillator.
- Linear waves.
- Nonlinear theory.
- Single oscillator.
- Forced oscillator.
- Coupled oscillator.
- Nonlinear waves.

**Fields of interest**
- Vibration, Dynamical Systems, Control; Appl. Mathematics/Computational Methods of Engineering; Dynamical Systems and Ergodic Theory.

**Discount group**
P

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K. F. Long, Reading, Berkshire, UK

**Deep Space Propulsion**

**A Roadmap to Interstellar Flight**

**Contents**
- Foreword.
- Preface.
- Chapter 1: Reaching for the Stars.
- Chapter 2: The Dream of Flight and the Vision of Tomorrow.
- Chapter 3: Fundamental Limitations to Achieving Interstellar Flight.
- Chapter 4: Aviation - The Pursuit of Speed, Distance and Height.
- Chapter 5: Astonautics - The Development and Science of Rockets.
- Chapter 6: Exploring The Solar System and Beyond.
- Chapter 7: Exploring Other Star Systems.
- Chapter 8: Solar System Explorers - Historical Spacecraft.
- Chapter 9: Electric and Nuclear-Based Propulsion.
- Chapter 10: Sails and Beams.
- Chapter 11: Nuclear Fusion Propulsion.
- Chapter 12: External Nuclear Pulse Propulsion.
- Chapter 13: Towards Relativistic Propulsion - Antimatter and the Interstellar Ramjet.
- Chapter 14: Aerospace Design Principles in Interstellar Flight.
- Chapter 15: The Scientific, Cultural and Economic Costs of Interstellar Flight.
- Chapter 16: The Role of Speculative Fiction in Driving Technology.
- Chapter 17: Realizing the Technological Future and The Roadmap To The Stars.
- Epilogue.
- Appendices.
- Index.

**Fields of interest**
- Aerospace Technology and Astronautics; Popular Science in Astronomy; Extragrestrial Physics, Space Sciences.

**Discount group**
P

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A. C. Luo, Southern Illinois University, Edwardsville, IL, USA; J. A. Machado, Polytechnic Institute of Porto, Portugal; D. Baleanu, Cankaya University, Ankara, Turkey (Eds.)

**Dynamical Systems and Methods**

**Contents**
- Part I: Nonlinear Dynamical Systems.
- 1. Mathematical analysis on chaos of a parametrically excited pendulum with damping force.
- 2. Energy in hybrid system nonlinear dynamics.
- 4. Synchronization analysis for two coupled populations of phase oscillators.
- 5. A Pendulum Synchronizing with a Duffing Oscillator under a Feedback Control.
- 6. The Ring Problem of (N+1) Bodies: An Overview.
- Part II: Mathematical Methods.
- 8. Approximate polynomial solution of a nonlinear differential equation with Applications in Engineering Problems.
- 9. Dynamical Symmetries of Second Order ODE.
- 10. Invar Energies on Riemannian Manifolds.
- 12. Remarks on Suzuki(C)-Condition.
- 14. Perturbation methods for solitons and their behavior as particles.
- 15. Complex analytic flows.
- 16. Unsteady MHD flow past a stretching sheet due to a heat source/sink.
- 17. Effect of chemical kinetics on permeability of a porous rock scaling by concentration of active fluid.
- 18. Exciton-phonon dynamics with long range interaction.
- 19....

**Fields of interest**
- Vibration, Dynamical Systems, Control; Classical Continuum Physics; Mathematical Modeling and Mathematics in Industry.

**Discount group**
P
Nonlinear Dynamical Systems in Engineering

Some Approximate Approaches

This book presents and extend different known methods to solve different types of strong nonlinearities encountered by engineering systems. A better knowledge of the classical methods presented in the first part lead to a better choice of the so-called “base functions”. These are absolutely necessary to obtain the auxiliary functions involved in the optimal approaches which are presented in the second part. Every chapter introduces a distinct approximate method applicable to nonlinear dynamical systems. Each approximate analytical approach is accompanied by representative examples related to nonlinear dynamical systems from to various fields of engineering.

Features
- Provides a better understanding of the base functions and the auxiliary functions for optimal approaches
- Inspires to appreciate the beauty as well as the usefulness of the optimal analytical techniques
- Includes many representative examples from to various fields of engineering

Contents
- Introduction.
- Perturbation method (Lindstedt-Poincaré).
- The method of harmonic balance.
- The method of multiple scales.
- The optimal homotopy asymptotic method.
- The optimal homotopy perturbation method.
- The optimal variational iteration method.
- Optimal parametric iteration method.

Fields of interest
- Complexity; Computational Mathematics and Numerical Analysis; Nonlinear Dynamics

Target groups
- Research

Discount group
- P

Room Acoustical Fields

This book presents the theory of room acoustical fields and revises the Mirror Source Methods for practical computational use, emphasizing the wave character of acoustical fields. The presented higher methods include the concepts of “Mirror Point Sources” and “Corner sources which allow for an excellent approximation of complex room geometries and even equipped rooms. In contrast to classical description, this book extends the theory of sound fields describing them by their complex sound pressure and the particle velocity. This approach enables accurate descriptions of interference and absorption phenomena.

Features
- Revises the Mirror Source Methods for practical computational use
- Allows for new and more precise numerical results
- Presents the method of corner sources and demonstrates its practical relevance

Contents
- Sound Sources.
- Monopole line source or point source.
- Mirror sources.
- Modified mirror sources.
- Hard-soft Superposition.
- Cubic room.
- Zone Solution in a cube.
- Field in a rectangular reverberant room.
- Flat rooms.
- Wedge rooms.
- Vault rooms.
- Cupola shaped rooms.
- Mirror source methods, rules.
- Geometrical subtasks and admittances.
- Mirror source fields in concave rooms.
- Sound radiation of a cooling tower.
- Reverberation with mirror sources.
- Mirror sources in convex rooms.
- Modified mirror procedure.
- Mirror sources and corner sources.
- Mirror sources combined with the principle of symmetry superposition (PSS).
- Mirror Sources and wedge space field.
- Corner scattering from literature.
- Concluding remarks.

Fields of interest
- Engineering Acoustics; Acoustics; Computational Science and Engineering

Target groups
- Research

Discount group
- P

Modeling, Learning, and Processing of Text-Technological Data Structures

Researchers in many disciplines have been concerned with modeling textual data in order to account for texts as the primary information unit of written communication.

Features
- Focuses on procedural aspects of automatic text analysis
- Integrates research in the upcoming and challenging text related disciplines. Such as computational linguistics, natural language processing, information retrieval, text and web mining as well as text and language technology
- Integrates a broad range of methods from text-technology, computational linguistics and machine learning
- Special emphasis is put on structure learning. Going beyond classical content-related text representation models in information retrieval and computational linguistics

Contents
- Part II Measuring Semantic Distance: Methods, Resources, and Applications.
- Part III From Textual Data to Ontologies, from Ontologies to Textual Data.
- Part IV Multidimensional Representations: Solutions for Complex Markup.
- Part VI Interfacing Textual Data, Ontological Resources and Document Parsing.

Fields of interest
- Applied Mathematics/Computational Methods of Engineeiring; Language Translation and Linguistics; Artificial Intelligence (incl. Robotics)

Target groups
- Research

Discount group
- P
Global Aerospace Monitoring and Disaster Management

In this book, space systems are situated in the global processes of the 21st century's information society and the role that space information systems could play in risk management is determined; methods of detecting and forecasting of both natural disasters and technogenic catastrophes and existing global and regional monitoring systems are described; and the IGMASS is introduced with its architecture and design concept and social and economic aspects and estimates of its creation, development, and utilization.

Features
- Methods of detecting and forecasting of both natural disasters and technogenic catastrophes are described
- Existing global and regional monitoring systems are described
- The role that space information systems could play in risk management is determined

Contents

Fields of interest
Aerospace Technology and Astronautics

Target groups
Research

Discount group
P

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Alternative Energy Sources

Alternative Energy Sources is designed to give the reader, a clear view of the role each form of alternative energy may play in supplying the energy needs of the human society in the near future (20-50 years). The two first chapters on “energy demand and supply” and “environmental effects,” set the tone as to why alternative energy is essential for the future. The third chapter gives the laws of energy conversion processes, as well as the limitations of converting one energy form to another. The section on exergy gives a quantitative background on the capability/potential of each energy source to produce power. The forth, fifth and sixth chapters are expositions of fission and fusion nuclear energy, the power plants that may produce power from these sources and the issues that will frame the public debate on nuclear energy.

Features
- Includes two chapters on nuclear energy by fission and one on fusion energy.
- Contains detailed chapter on “energy storage.”
- Assumes minimum prior knowledge on behalf of the reader and imparts some of the pre-requisite knowledge

Contents

Fields of interest
Renewable Energy Sources; Renewable and Green Energy; Sustainable Development

Target groups
Graduate

Discount group
P

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Biomimetics in Materials Science

Self-Healing, Self-Lubricating, and Self-Cleaning Materials

Contents

Fields of interest
Continuum Mechanics and Mechanics of Materials; Polymer Sciences; Tribology, Corrosion and Coatings

Target groups
Research

Discount group
P
B. Obradović, University of Belgrade, Serbia (Ed.)

Cell and Tissue Engineering

"Cell and Tissue Engineering" introduces the principles and new approaches in cell and tissue engineering. It includes both the fundamentals and the current trends in cell and tissue engineering, in a way useful both to a novice and an expert in the field.

Features
- Provides a resource and stimulus for biomedical engineering research and education
- Written by the leading experts
- Assembles an insight in cell and tissue function starting form a molecular nano-level, extending to a cellular micro-level and finishing at the tissue macro-level
- Illustrations enhance the quality and ease of use of the presented material

Contents

Fields of interest
- Biomedical Engineering; Cell Biology; Biomaterials

Target groups
- Research

Discount group
- P

Due September 2011

No distribution rights for Croatia, Slovenia and Serbia and Montenegro

2011. VI, 274 p. Hardcover
- approx. $139.00
- ISBN 978-3-642-21912-2

F. Pacheco Torgal, S. Jalali, University of Minho, Guimarães, Portugal

Eco-efficient Construction and Building Materials

Eco-efficient Construction and Building Materials provides essential reading about materials for the construction industry in the twenty-first century. It covers the latest findings in the field, especially the toxicity aspects, embodied energy, construction and demolition wastes, the use of wastes in concrete, masonry units, materials reinforced with vegetable fibres, earth construction, the durability aspects, and also the importance of nanotechnology to the development of more environmentally-friendly materials. Based on more than nine hundred references, Eco-efficient Construction and Building Materials is of fundamental importance to academics, engineers and architects who are dedicated to the creation of a greener and more holistic construction industry.

Features
- Addresses a new vision for construction materials by emphasizing the importance of their environmental impact
- Covers the latest findings in the field, especially the toxicity aspects
- Includes research findings that are vital to professionals in the building industry

Contents

Fields of interest
- Building Materials; Energy Efficiency (incl. Buildings); Structural Materials

Target groups
- Research

Discount group
- P

R. Pode, D. Boucar, Kyung-Hee University, Seoul, Korea

Solar Lighting

Limited availability of grid-based electricity is a major challenge faced by many developing countries, particularly the rural population. Fuel-based lighting, such as the kerosene lantern, is widespread in these areas, but it is a poor alternative, contributing to global warming and causing serious health problems. Several developing countries are therefore now encouraging the use of sustainable lighting. Solar Lighting gives an in-depth analysis of energy-efficient light production through the use of solar-powered LED systems. The authors pay particular attention to the interplay between energy transformation and device efficiency. They also discuss diverse aspects of renewable energy, including how an improvement in the efficiency of appliances can reduce the cost of energy. Solar Lighting is written for physicists, environmental experts and lighting engineers. It is also suitable for undergraduate students in the fields of environmental science, electrical engineering and renewable energy.

Features
- Discusses energy-efficient lighting sources
- Focuses on the engineering of solar-powered LED lighting
- Enables readers to improve provision of solar lighting

Contents

Fields of interest
- Renewable Energy Sources; Engineering Economics, Organization, Logistics, Marketing; Sustainable Development

Target groups
- Research

Discount group
- P

Due October 2011

- $129.00
- ISBN 978-1-4471-2133-6
Electrokinetics and Electrohydrodynamics in Microsystems

Among the most promising techniques to handle small objects at the micrometer scale are those that employ electrical forces, which have the advantages of voltage-based control and dominance over other forces. The book provides a state-of-the-art knowledge on both theoretical and applied aspects of the electrical manipulation of colloidal particles and fluids in microsystems and covers the following topics: dielectrophoresis, electrowetting, electrohydrodynamics in microsystems, and electrokinetics of fluids and particles.

Features
► Different techniques of electrical manipulation of fluids and particles in Microsystems are explained in one volume. ► Numerous up-to-date and key references provide the state-of-the-art knowledge to the reader. ► Includes many applied aspects of the electrical manipulation of colloidal particles and fluids in microsystems.

Contents

Fields of interest
Nanotechnology and Microengineering; Nanoscale Science and Technology; Biotechnology

Target groups
Research

Discount group
P

S. T. Rassia, University of Cambridge, UK;
P. M. Pardalos, University of Florida, Gainesville, FL, USA (Eds.)

Sustainable Environmental Design in Architecture
Impacts on Health

Contents

Fields of interest
Engineering Design: Operations Research, Management Science; Environmental Health

Target groups
Research

Discount group
P

B. Robyns, Hautes Etudes d'Ingénieur, Lille, France; B. Francois, Ecole Centrale de Lille, Villeneuve d’Ascq, France; P. Degobert, Arts et Métiers ParisTech, Lille, France; J. P. Hautier, Arts et Métiers ParisTech, Paris, France

Vector Control of Induction Machines
Desensitisation and Optimisation Through Fuzzy Logic

After a brief introduction to the main law of physics and fundamental concepts inherent in electromechanical conversion, Vector Control of Induction Machines introduces the standard mathematical models for induction machines – whichever rotor technology is used – as well as several squirrel-cage induction machine vector-control strategies. The use of causal ordering graphs allows systematization of the design stage, as well as standardization of the structure of control devices. Vector Control of Induction Machines suggests a unique approach aimed at reducing parameter sensitivity for vector controls based on a theoretical analysis of this sensitivity.

Features
► Introduces the reader to electromechanical conversion. ► Develops a theoretical method to analyze parameter sensitivity of vector control strategies. ► Includes various applications that deal with a flywheel energy storage system.

Contents

Fields of interest
Power Electronics, Electrical Machines and Networks; Mathematical Modeling and Mathematics in Industry; Simulation and Modeling

Target groups
Research

Discount group
P
Intelligent Open Learning Systems

**Concepts, Models and Algorithms**

In presented book the Intelligent Open Learning Systems (IOLS) are proposed, described, discussed, and evaluated. The IOLS is a system in which traditional methods of online teaching are enhanced through the use of artificial intelligence and cognitive science. This is the main topic of the book. It consists of ten chapters and is divided into three parts. The first part concentrates on the Open Learning System (OLS) analysis, in particular: the social and educational meanings of the OLS, the new role of the teacher and the new requirements regarding the structure of didactic material. Moreover, the cybernetic model of student, teacher and computer collaboration is presented, the teaching-learning process content and its main characteristics are discussed, and the system based approach to the OLS design is proposed.

**Features**

- Latest research on Intelligent Open Learning Systems
- Presents concepts, models and algorithms
- Written by leading experts in the field

**Contents**

Part I: System Analysis Of The Open Learning Systems.- Part II: The Problem Of Knowledge Modeling In Open And Distance Learning.- Part III: Applications Of Open Learning Systems.

**Fields of interest**

Computational Intelligence; Artificial Intelligence (incl. Robotics)

**Target groups**

Research

**Discount group**

P

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A. Rusinko, Obuda University, Budapest, Hungary; K. Rusinko, Budapest University of Technology and Economics, Budapest, Hungary

Plasticity and Creep of Metals

This book serves both as a textbook and a scientific work. As a textbook, the work gives a clear, thorough and systematic presentation of the fundamental postulates, theorems and principles and their applications of the classical mathematical theories of plasticity and creep. In addition to the mathematical theories, the physical theory of plasticity, the book presents the Budiansky concept of slp and its modification by M. Leonov. Special attention is given to the analysis of the advantages and shortcomings of the classical theories. In its main part, the book presents the synthetic theory of irreversible deformations, which is based on the mathematical Sanders flow plasticity theory and the physical theory, the Budiansky concept of slp. The main peculiarity of the synthetic theory is that the formulae for both plastic and creep deformation, as well their interrelations, can be derived from the single constitutive equation. Furthermore, the synthetic theory, as physical one, can take into account the real processes that take place in solids at irreversible deformation. This widens considerably the potential of the synthetic theory.

**Features**

- Serves both as a textbook and a scientific work
- Presents the synthetic theory of irreversible deformations
- Shows the solution of some contemporary problems

**Contents**


**Fields of interest**

Continuum Mechanics and Mechanics of Materials; Computational Mathematics and Numerical Analysis; Metallic Materials

**Target groups**

Research

**Discount group**

P

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D. Ryżko, P. Gawrysiak, H. Rybinski, M. Kryszkiewicz, Warsaw University of Technology, Poland

Emerging Intelligent Technologies in Industry

Intelligent technologies are the essential factors of innovation, and enable the industry to overcome technological limitations and explore the new frontiers. Therefore it is necessary for scientists and practitioners to cooperate and inspire each other, and use the latest research results in creating new designs and products. The idea of this book came out with the industrial workshop organized at the ISMIS conference in Warsaw, 2011. The book covers several applications of emerging, intelligent technologies in various branches of the industry. The contributions describe modern intelligent tools, algorithms and architectures, which have the potential to solve real problems, experienced by practitioners in various industry sectors. We hope this volume will show new directions for cooperation between science and industry and will facilitate efficient transfer of knowledge in the area of intelligent information systems.

**Features**

- Latest research devoted to applications of emerging, intelligent technologies in different branches of industry
- Ranging from new algorithms to architectures and tools with applications in various business sectors
- Written by leading experts in the field

**Contents**

AI in the Industry.- Modern intelligent tools for software engineering.- NLP tools for intelligent systems.- Data mining tools for advanced applications.- Telecommunication applications.- Advanced methods for customer behavior analysis.

**Fields of interest**

Computational Intelligence; Artificial Intelligence (incl. Robotics)

**Target groups**

Research

**Discount group**

P

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A. J. Sangster, Heriot-Watt University, Edinburgh, UK

Warming to Ecocide
A Thermodynamic Diagnosis

Despite scientific evidence that business-as-usual is unsustainable, there is a huge and widespread inertia to ‘greening’ the planet. Warming to Ecocide considers climate change from a thermodynamic perspective and asks whether market-driven organisations have carried us to the point of no return through the flawed economics of endless growth. Warming to Ecocide begins by exploring the thermodynamic origins of climate change. It demonstrates that equilibrium thermodynamics can provide full explanations for the basic processes of life such as photosynthesis and metabolism, and that non-equilibrium thermodynamics is close to providing an explanation for how life started.

Features
► Suggests a route to avoiding runaway climate change by reinstating the greenhouse thermostat to its full operational capacity ► Addresses mankind’s contribution to climate change from a thermodynamic perspective ► Describes and illustrates the power of thermodynamics to furnish insights into the thermal behaviour of complex physical systems

Contents

Fields of interest
Engineering Thermodynamics, Heat and Mass Transfer; Climate Change; Energy; general

Target groups
Research

Discount group
P

P. M. Shankar, Drexel University, Philadelphia, PA, USA

Fading and Shadowing in Wireless Systems

The study of signal transmission and deterioration in signal characteristics as the signal propagates through wireless channels is of great significance. The book presents a comprehensive view of channel degradation arising from fading and shadowing. Various statistical models including simple, hybrid, compound, complex and cascaded ones are presented with detailed derivations along with measures to quantify the deterioration such as the amount of fading, error rates and outage probabilities. The models range from the Rayleigh and Rician through Suzuki, generalized K, cascaded and alpha-mu and similar ones. This is followed by the analysis of mitigation of fading and shadowing through diversity (simple, hybrid, micro- and macro- level) and combining algorithms.

Features
► Covers techniques to combat shadowing and fading that are critical to the improvement of reliable data communication capabilities ► Provides a broad and deep understanding of factors adversely impacting wireless systems and methods to overcome these challenges ► Discusses topics that are critical to the enhancement of reliable data communication capabilities at higher rates both in traditional wireless systems as well as ultra wide band (UWB) systems

Contents

Fields of interest
Communications Engineering, Networks; Coding and Information Theory;

Target groups
Research

Discount group
P

A. A. Siqueira, Universidade de São Paulo, São Carlos, Brazil; M. Bergerman, Carnegie Mellon University, Pittsburgh, PA, USA

Robust Control of Robots
Fault Tolerant Approaches

Robust Control of Robots bridges the gap between robust control theory and applications, with a special focus on robotic manipulators. It is divided into three parts: robust control of regular, fully-actuated robotic manipulators; robust post-failure control of robotic manipulators; and robust control of cooperative robotic manipulators. In each chapter the mathematical concepts are illustrated with experimental results obtained with a two-manipulator system. They are presented in enough detail to allow readers to implement the concepts in their own systems, or in Control Environment for Robots, a MATLAB®-based simulation program freely available from the authors.

Features
► Comes with access to online material containing a MATLAB®-based simulator including all controllers presented in the book ► Discusses experimental results of the implementation of H-infinity controllers in manipulators and wheeled mobile robots ► Written by experts in robust control of robots

Contents

Fields of interest
Control, Robotics, Mechatronics; Artificial Intelligence (incl. Robotics)

Target groups
Research

Discount group
P
Solar Energy in the Winemaking Industry

Solar Energy in the Winemaking Industry fully documents all aspects of the modern solar winery, beginning with the main drivers (environmental, economic and political) and detailing the current winemaking industry and solar technologies available. It details the various energy demands in the winemaking process from harvest to bottling and beyond. Solar Energy in the Winemaking Industry catalogues the range of wineries globally that have installed a substantial solar collecting system and uses case study material to give the reader an appreciation of the diversity of solar winery facilities. From large industrial-style wineries to boutique family-run wineries; from new state-of-the-art facilities to 15th-century palaces, the application for solar is limitless.

Features
- Forms a comprehensive reference source to those studying or working in the wine or solar industries
- Offers the reader detailed guidance on the design and operation of a solar wine making facility
- Includes over 500 illustrations to aid the reader’s understanding

Contents
1. Introduction to the Solar Winery
2. Introduction to Winemaking
3. Solar Technology
4. Energy Flows in Winemaking Facilities
5. Review of Existing Solar Wineries
7. Review of Existing Solar Wineries

Target groups
- Renewable Energy Sources; Agriculture; Sustainable Development

Discount group
- Research

Musical Robots and Interactive Multimodal Systems

Musical robots and Interactive Multimodal Systems: An Introduction
- Section I: Understanding Elements of Musical Performance and Expression
- Sound-action Chunks in Music
- Automatic Music Transcription: from Monophonic to Polyphonic
- Multimodal Analysis of Expressive Gesture in Music Performance
- Input Devices and Music Interaction
- Capturing Bowing Gesture: Interpreting Individual Technique
- Interactive Multimedia for Technology-enhanced Learning with Multimodal Feedback
- Online Gesture Analysis and Control of Audio Processing

Fields of interest
- Robotics and Automation; Artificial Intelligence (incl. Robotics); Music

Target groups
- Research

Discount group
- P

SystemVerilog for Verification
A Guide to Learning the Testbench Language Features

SystemVerilog for Verification, A Guide to Learning the Testbench Language Features, Third Edition, is an academic edition that covers all verification features of the SystemVerilog language, with hundreds of examples to clearly explain the concepts and basic fundamentals.

Features
- Completely updated technical material incorporating more fundamentals, latest changes to IEEE specifications since second edition, and adding end of chapter problems
- Contains dozens of methodology recommendations plus warnings of common mistakes made by new users of the language
- Includes supplementary material designed to assist instructors with both teaching and assessing their students as well as solutions to all problems

Contents
- Verification Guidelines
- Data Types
- Procedural Statements and Routines
- Verifying the Testbench
- Advanced Interfaces
- Advanced OOP and Testbench Guidelines
- Functional Coverage
- Advanced Interfaces

Fields of interest
- Circuits and Systems; Computer-Aided Engineering (CAD, CAE) and Design; Computer Hardware

Target groups
- Graduate

Discount group
- P
Due September 2011

M. Tehranipoor, K. Peng, University of Connecticut, Storrs, CT, USA; K. Chakrabarty, Duke University, Durham, NC, USA

Test and Diagnosis for Small-Delay Defects

This book will introduce new techniques for detecting and diagnosing small-delay defects in integrated circuits. Although this sort of timing defect is commonly found in integrated circuits manufactured with nanometer technology, this will be the first book to introduce effective and scalable methodologies for screening and diagnosing small-delay defects, including important parameters such as process variations, crosstalk, and power supply noise.

Features
► Provides an introduction to VLSI testing and diagnosis, with a focus on delay testing and small-delay defects
► Presents the most effective techniques for screening small-delay defects, such as long path-based, slack-based, critical fault-based, and noise-aware methodologies
► Shows readers to use timing information for small-delay defect diagnosis, in order to increase the resolution of their current diagnosis flow

Contents

Fields of interest
Circuits and Systems; Performance and Reliability; Nanotechnology and Microengineering

Target groups
Research

Discount group
P

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Due August 2011

A. Varga, DLR - Oberpfaffenhofen, Wessling, Germany; A. Hansson, Linköpings University, Sweden; G. Puyou, Airbus, Toulouse, France (Eds.)

Optimization Based Clearance of Flight Control Laws

A Civil Aircraft Application

This book summarizes the main achievements of the EC funded 6th Framework Program project COFCLUO – Clearance of Flight Control Laws Using Optimization. This project successfully contributed to the achievement of a top-level objective to meet society’s needs for a more efficient, safer and environmentally friendly air transport by providing new techniques and tools for the clearance of flight control laws. This is an important part of the certification and qualification process of an aircraft – a costly and time-consuming process for the aeronautical industry. The overall objective of the COFCLUO project was to develop and apply optimization techniques to the clearance of flight control laws in order to improve efficiency and reliability. In the book, the new techniques are explained and benchmarked against traditional techniques currently used by the industry.

Features
► Recent research on Optimization Based Clearance of Flight Control Laws
► Summarizes the main achievements of the EC founded 6th Framework Programme COFCLUO project
► Written by leading experts in the field

Contents

Fields of interest
Control; Aerospace Technology and Astronautics; Systems Theory, Control

Target groups
Research

Discount group
P

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Due November 2011

K. Verghese, H. Lewis, RMIT University, Melbourne, VIC, Australia; L. Fitzpatrick, Birubi Innovation, Dandenong, VIC, Australia (Eds.)

Packaging for Sustainability

The packaging industry is under pressure from regulators, customers and other stakeholders to improve packaging’s sustainability by reducing its environmental and societal impacts. This is a considerable challenge because of the complex interactions between products and their packaging, and the many roles that packaging plays in the supply chain. Packaging for Sustainability is a concise and readable handbook for practitioners who are trying to implement sustainability strategies for packaging. Industry case studies are used throughout the book to illustrate possible applications and scenarios.

Features
► Provides a concise and readable handbook for practitioners who are trying to implement sustainability strategies for packaging
► Draws on the expertise of researchers and industry practitioners to provide information on business benefits and environmental issues
► Includes industry case studies

Contents

Fields of interest
Industrial and Production Engineering; Waste Management/Waste Technology; Engineering Design

Target groups
Research

Discount group
P
**Fluid Effects in Polymers and Polymeric Composites**

Fluid Effects in Polymers and Polymeric Composites, written by the late Dr. Y. Jack Weitsman, addresses the wide range of parameters that affect the interaction of fluids with polymers and polymeric composites. The book aims at broadening the scope of available data, mostly limited up to this time to weight-gain recordings of fluid ingress into polymers and composites, to the practical circumstances of fluctuating exposure. Various forms of experimental data are given, in conjunction with theoretical models derived from basic scientific principles, and correlated with severity of exposure conditions and interpreted by means of rationally based theoretical models. The practical implications of the effects of fluids are discussed.

**Contents**

1. Introduction.
2. Background to Polymers and Composites.
5. Diffusion Models.
7. Effects of Fluids on Strength, Deformation and Fatigue of Polymeric Composites.
8. Sea Water Effects on Foam Cored Sandwich Structures.
9. Special Issues.
10. Summary and Conclusions.

**Fields of interest**

Mechanical Engineering; Classical Continuum Physics; Polymer Sciences

**Target groups**

Research

**Discount group**

P

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**Recursive Estimation and Time-Series Analysis**

An Introduction for the Student and Practitioner

This is a revised version of the 1984 book of the same name but considerably modified and enlarged to accommodate the developments in recursive estimation and time series analysis that have occurred over the last quarter century. Also over this time, the CAPTAIN Toolbox for recursive estimation and time series analysis has been developed at Lancaster, for use in the Matlab software environment (see Appendix G).

**Features**

- Intended for undergraduate or Masters students who wish to obtain a grounding in this subject
- Written for practitioners in industry
- Written for experts in this field

**Contents**

Introduction.
- Part I Recursive Estimation of Parameters in Linear Regression Models.
- Recursive Least Squares Estimation.
- Recursive Estimation of Time Variable Parameters in Regression Models.
- Unobserved Component Models.
- Part II Recursive Estimation of Parameters in Transfer Function Models.
- Transfer Function Models and the Limitations of Recursive Least Squares.
- Optimal Identification and Estimation of Discrete-Time Transfer Function Models.
- Optimal Identification and Estimation of Continuous-Time Transfer Function Models.
- Identification of TF models in Closed-Loop.
- Real-Time Recursive Parameter Estimation.
- Part III Other Topics.
- State-Dependent Parameter Estimation.
- Data-Based Mechanistic (DBM) modeling.

**Fields of interest**

Control; Probability Theory and Stochastic Processes; Complex Networks

**Target groups**

Research

**Discount group**

P

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**Trends in Computational Contact Mechanics**

The subject of Computational Contact Mechanics has many facets. Its main impact lies in the transfer of knowledge form theoretical research to applied sciences, and from there to industry. The application fields are literally countless, ranging from classical engineering to biomechanics and nano-sciences. The remarkable increase of computer power in recent years has been instrumental in enabling the development of simulation-based analysis in current design activity. This still involves tremendous effort in research, which focuses on, for example, multi-field and multi-scale problems, algorithmic robustness, and geometrical accuracy.

**Features**

- Recent trends in Computational Contact Mechanics
- Scientific edited outcome of the 1st Int. Conference on Computational Contact Mechanics ICCCM 09 held at Lecce Italy, Sept. 2009
- Written by leading experts in the field

**Contents**

From the content: Contact Modelling in Entangled Fibrous Materials.
- 3D Contact Smoothing Method Based on Quasi-C1 Interpolation.
- On a Geometrically Exact Theory for Contact Interactions.
- Finite Deformation Contact Based on a 3D Dual Mortar and Semi-Smooth Newton Approach.
- The Contact Patch Test for Linear Contact Pressure Distributions in 2D Frictionless Contact.

**Fields of interest**

Theoretical and Applied Mechanics; Applied Mathematics/Computational Methods of Engineering; Continuum Mechanics and Mechanics of Materials

**Target groups**

Research

**Discount group**

P

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D. Zaykovskiy, W. Minker, University of Ulm, Germany

**Speech Recognition for Mobile Phones**

Speech Recognition for Mobile Phones considers practical aspects for the development and deployment of client-server speech-enabled information systems. The authors discuss different paradigms for speech recognition for mobile devices. The strengths of the DSR technique are demonstrated. Platforms that have proven to be suitable for the implementation of acoustic front-ends on cellular phones (including Java Micro Edition (J2ME) and Symbian C++) are analyzed. In addition, an introduction to corresponding integrated development environments such as Eclipse and Carbide is provided. The authors study issues related to an efficient data transmission over GSM and 3G networks, compare data transmission systems based on TCP/IP and UDP/IP protocols, and highlight their advantages and drawbacks.

**Features**
- Considers practical aspects for the development and deployment of client-server speech-enabled information systems
- Provides the reader with plug-in ready solutions for the deployment of DSR systems on conventional mobile appliances that operate on existing network infrastructures

**Contents**
Paradigms for speech recognition for mobile devices.

**Fields of interest**
Signal, Image and Speech Processing; Acoustics; Communications Engineering, Networks

**Target groups**
Research

**Discount group**
P

Due August 2012

2012. Approx. 190 p. (Lecture Notes in Electrical Engineering, Volume 1011) Hardcover

➤ approx. $99.95
ISBN 978-1-4419-6177-8

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M. Zilberman, Tel Aviv University, Ramat Aviv, Israel (Ed.)

**Active Implants and Scaffolds for Tissue Regeneration**

Active implants are actually drug or protein-eluting implants that induce healing effects, in addition to their regular task, such as support. This effect is achieved by controlled release of the active agent to the surrounding tissue. This book will give a broad overview of biomaterial platforms used as basic elements of drug-eluting implants. It will include mainly coatings for vascular stents with controlled release of antiproliferative agents, wound dressings with controlled release of antibacterial agents, drug-eluting vascular grafts, protein-eluting scaffolds for tissue regeneration, drug-eluting platforms for dental and other applications. Thus, both internal and external implants are described. The drug-eluting implants will be described in terms of matrix formats and polymers, incorporated drugs and their release profiles from the implants, as well as implant functioning.

**Features**
- Gives a broad overview of biomaterial platforms for drug-eluting implants
- Presents new approaches for creating clinically important biomedical applications
- Describes both, internal and external implants

**Contents**
Part I: Drug-Eluting Implants.
- Part II: Scaffolds for Bone Regeneration.
- Part III: Scaffolds Based on Natural Polymers.

**Fields of interest**
Biomedical Engineering; Biomaterials; Molecular Medicine

**Target groups**
Research

**Discount group**
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**Features**
- Describes mathematical models that enable prediction of phase compositions for various technological processes
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- Metal and Slag Melts Structure and Properties Theory.
- High-Temperature Processes Simulation.
- Mathematical Models for Steel Production.
- High-Temperature Physico-Chemical Processes of Welding, Depositing, and Coating.
- Structure, Phase Composition and Properties Prediction.

**Fields of interest**
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