**Programming for the Android Dalvik Virtual Machine**

J. Absar, Advanced Micro Devices, Bangalore, India

This book is an excellent guide for Android programmers on how to tune their programs for the best speed of execution inside the Dalvik Virtual Machine (DVM). It helps readers write more efficient code, understand how DVM works and how virtual machines are designed and work in general, while emphasizing key concepts that any Android Java programmer must understand.

**Features**
- Demystifies the android Dalvik virtual machine and demonstrates key concepts that any Android Java programmer must understand
- Offers valuable insight into the Just-In-Time Compiler inside the DVM (which can speed code by 3X)
- Demonstrates different components of an embedded device Java virtual machine (e.g., JIT compiler, interpreter, garbage collection, class loading)

**Contents**
- Introduction
- Why Dalvik
- Bytecodes, Dexcodes and Virtual Machines
- Just in Time Compiler inside the DVM
- Interpreter - Executing your code
- Class Loading
- Synchronization - Semaphores and Locks
- Garbage Collector
- Thread Creation and Handling in DVM
- Exception Handling
- Multicore on Android

**Fields of interest**
- Circuits and Systems
- Programming Languages
- Compilers
- Interpreters

**Target groups**
- Professional/practitioner

**Product category**
- Professional book

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**Towards Practical Brain-Computer Interfaces**

B. Allison, Graz University of Technology, Austria; S. Dunne, Starlab Neuroscience Research, Barcelona, Spain; R. Leeb, Swiss Federal Institute of Technology Lausanne, Switzerland; J. Del R. Millán, Swiss Federal Institute of Technology Lausanne, Switzerland; A. Nijholt, University of Twente, The Netherlands (Eds)

**Bridging the Gap from Research to Real-World Applications**

Brain–computer interfaces (BCIs) are devices that enable people to communicate via thought alone. Brain signals can be directly translated into messages or commands. Until recently, these devices were used primarily to help people who could not move. However, BCIs are now becoming practical tools for a wide variety of people, in many different situations. What will BCIs in the future be like? Who will use them, and why? This book, written by many of the top BCI researchers and developers, reviews the latest progress in the different components of BCIs.

**Features**
- Forward-looking survey by leading experts
- Accessible to non-specialists and interested laypersons
- Gives fascinating insights into the enabling potential of BCIs
- Explains component design challenges and solutions
- Useful for a variety of college courses

**Contents**
- Sensors, Signals, and Signal Processing
- Devices, Applications and Users
- Application Interfaces and Environments

**Fields of interest**
- Biomedical Engineering
- Neurology
- Neurobiology

**Target groups**
- Research

**Product category**
- Monograph
The Architectural Institute of Japan (Ed)

Preliminary Reconnaissance Report of the 2011 Tohoku-Chiho Taiheiyo-Oki Earthquake

Devastating damage in the Tohoku region of Japan occurred during and after the earthquake off the Pacific coast of Tohoku earthquake on March 11, 2011. The AIJ (Architectural Institute of Japan) dispatched reconnaissance teams into the field to obtain basic facts on the damage to buildings due to the massive ground motions and resultant tsunami. Their mission included collecting information on the characteristics of the earthquake itself and the observed major ground motions and tsunami. Their mission included collecting information on the characteristics of the earthquake itself and the observed major ground motions and tsunami. For the structural damage investigation, buildings are classified by their type of construction, namely, steel buildings, reinforced concrete buildings, wooden houses, etc.

Features
- The only official reconnaissance report of the Architectural Institute of Japan
- Full of concrete information on building damages in the Tohoku and Kanto regions
- Mainly consists of field information in the damaged areas without detailed analysis

Contents

Fields of interest
Civil Engineering; Basics of Construction; Natural Hazards

Target groups
Research

Product category
Monograph

Due July 2012
2012. Approx. 360 p. 555 illus., 514 in color. (Geotechnical, Geological and Earthquake Engineering, Volume 23) Hardcover
- € (D) 139,05 | € (A) 142,94 | sFr 173,00
- € 129,95 | £117.00
ISBN 978-3-642-29507-2

P. Ariza, Universidad de Sevilla, Spain (Ed)

Micromechanics of Defects in Solids

This volume presents recent developments in the theory of defects and the mechanics of material forces. The book constitutes a selection of the contributions presented at the International Symposium on Defect and Material Mechanics (ISDMM2011), held in Seville, Spain, June 2011. The ISDMM series of symposia provides a rare and much-needed forum for bringing together a diverse group of researchers from various areas ranging from theoretical, experimental and computational modeling of the mechanics of materials.

Features
- Broad range of applications
- Contributions by world leading experts
- Unique approach to the subject

Contents
Preface.- Numerical simulation of intergranular and transgranular crack propagation in ferroelectric polycrystals.- Microstructure and stray electric fields at surface cracks in ferroelectrics.- Double kink mechanisms for discrete dislocations in BCC crystals.- The expanding spherical inhomogeneity with transformation strain.- A new model of damage: a moving thick layer approach.- On configurational forces at boundaries in fracture mechanics.- HotQC simulation of nanovoid growth under tension in copper.- Coupled phase transformations and plasticity as a field theory of deformation incompatibility.- Continuum strain-gradient elasticity from discrete valence force field theory for diamond-like crystals.

Fields of interest
Continuum Mechanics and Mechanics of Materials; Characterization and Evaluation of Materials; Mechanics

Target groups
Research

Product category
Monograph

Due July 2012
2012. X, 250 p. 69 illus., 31 in color. Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 143,50
- approx. € 99,95 | £90.00
ISBN 978-3-642-007-4625

T. Astarita, G. M. Carломagno, Università Napoli Federico II, Italy

Infrared Thermography for Thermo-Fluid-Dynamics

Infrared thermography is a measurement technique that enables to obtain non intrusive measurements of surface temperatures. One of the interesting features of this technique is its ability to measure a full two dimensional map of the surface temperature and for this reason it has been widely used as a flow visualization technique. Since the temperature measurements can be extremely accurate it is possible, by using a heat flux sensor, also to measure convective heat transfer coefficient distributions on a surface making the technique de facto quantitative. This book, starting from the basic theory of infrared thermography and heat flux sensor guides, both the experienced researcher and the young student, in the correct application of this powerful technique to various practical problems. A significant number of examples and applications are also examined in detail.

Features
- Introduction into this very accurate surface temperature measurement methods
- Examines a significant number of examples and applications in detail
- Guides both, the experienced researcher and the young student

Contents

Fields of interest
Engineering Fluid Dynamics; Measurement Science and Instrumentation; Security Science and Technology

Target groups
Research

Product category
Monograph

Due May 2012
2012. VI, 244 p. (Experimental Fluid Mechanics) Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 143,50
- approx. € 99,95 | £90.00
ISBN 978-3-642-29507-2

Due May 2012
2012. VI, 244 p. (Experimental Fluid Mechanics) Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 143,50
- approx. € 99,95 | £90.00
ISBN 978-3-642-29507-2
On Intuitionistic Fuzzy Sets Theory

This book aims to be a comprehensive and accurate survey of state-of-the-art research on intuitionistic fuzzy sets theory and could be considered a continuation and extension of the author’s previous book on Intuitionistic Fuzzy Sets, published by Springer in 1999 (Atanassov, Krassimir T., Intuitionistic Fuzzy Sets, Studies in Fuzziness and Soft Computing, ISBN 978-3-7908-1228-2, 1999). Since the aforementioned book has appeared, the research activity of the author within the area of intuitionistic fuzzy sets has been expanding into many directions. The results of the author’s most recent work covering the past 12 years as well as the newest general ideas and open problems in this field have been therefore collected in this new book.

Features

- State-of-art research on Intuitionistic Fuzzy Sets Theory
- Comprehensive report of the past twelve years research of the author (and not only) on intuitionistic fuzzy sets theory
- Written by a leading expert in the field

Contents

On the concept of IFSs.- Operations and relations over IFSs.- Geometrical interpretations of IFSs.- Modal and topological operators.- Extended modal operators.- Other types of operators.- Norms and metrics over IFSs.- Intuitionistic Fuzzy Relations (IFRs).- New intuitionistic fuzzy operations.- On two new extensions of intuitionistic fuzzy sets.- Concluding remarks.

Fields of interests

Computational Intelligence; Mathematical Logic and Foundations; Number Theory

Target groups

Research

Product category

Monograph

CMOS Receiver Front-ends for Gigabit Short-Range Optical Communications

This book describes optical receiver solutions integrated in standard CMOS technology, attaining high-speed short-range transmission within cost-effective constraints. These techniques support short reach applications, such as local area networks, fiber-to-the-home and multimedia systems in cars and homes. The authors show how to implement the optical front-end in the same technology as the subsequent digital circuitry, leading to integration of the entire receiver system in the same chip. The presentation focuses on CMOS receiver design targeting gigabit transmission along a low-cost, standardized plastic optical fiber up to 50m in length.

Features

- Reviews optical communications, including long-haul transmission systems and emerging applications focused on short-range
- Explains necessary fundamentals, such as characteristics of data signal, system requirements affecting receiver design and key parameters in receiver design
- Covers the complete design flow of optical CMOS receivers, from analysis of theoretical fundamentals of optical transmission to the final architecture aimed for a short-range application at gigabit transmission

Contents


Fields of interests

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Microwaves, RF and Optical Engineering

Target groups

Research

Product category

Monograph
Numerical Analysis of Vibrations of Structures under Moving Inertial Load

Moving inertial loads are applied to structures in civil engineering, robotics, and mechanical engineering. Some fundamental books exist, as well as thousands of research papers. Well known is the book by L. Fryba, Vibrations of Solids and Structures Under Moving Loads, which describes almost all problems concerning non-inertial loads. This book presents breadth of description of numerical tools successfully applied to structural dynamic analysis. Physically we deal with non-conservative systems. The discrete approach formulated with the use of the classical finite element method results in elemental matrices, which can be directly added to global structure matrices.

Features
- Presents broad description of numerical tools successfully applied to structural dynamic analysis
- Presents recent research on Numerical analysis of vibrations of structures under moving inertial load
- Written by leading experts in the field

Contents

Fields of interests
Structural Mechanics; Theoretical and Applied Mechanics; Mechanics

Target groups
Research

Product category
Monograph

Due May 2012
2012. XII, 284 p. (Lecture Notes in Applied and Computational Mechanics, Volume 65) Hardcover
- *€ (D) 139,05 | € (A) 142,94 | sFr 173,00
- € 129,95 | £117.00
ISBN 978-3-642-29547-8

New Concepts and Applications in Soft Computing

The book provides a sample of research on the innovative theory and applications of soft computing paradigms. The idea of Soft Computing was initiated in 1981 when Professor Zadeh published his first paper on soft data analysis and constantly evolved ever since.

Features
- State of the art of Soft Computing
- New concepts and applications in Soft Computing
- Written by leading experts in this field
- Includes recent theoretical foundations and practical applications as extended works presented in the International Workshop SOFA 2009, SOFA 2010 and additional papers

Contents

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

Target groups
Research

Product category
Monograph

Due April 2012
2012. XII, 278 p. (Studies in Computational Intelligence, Volume 417) Hardcover
- *€ (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00
ISBN 978-3-642-28958-3

Applications of Chaos and Nonlinear Dynamics in Science and Engineering - Vol. 2

Chaos and nonlinear dynamics initially developed as a new emergent field with its foundation in physics and applied mathematics. The highly generic, interdisciplinary quality of the insights gained in the last few decades has spawned myriad applications in almost all branches of science and technology—and even well beyond. Wherever the quantitative modeling and analysis of complex, nonlinear phenomena are required, chaos theory and its methods can play a key role.

Features
- Features state-of-the-art, concrete and real-world applications in various fields of engineering/applied sciences
- Contributions written by active and leading research groups
- Useful as both a reference and recipe handbook of successful application

Contents

Fields of interests
Vibration, Dynamical Systems, Control; Nonlinear Dynamics; Appl.Mathematics/Computational Methods of Engineering

Target groups
Research

Product category
Monograph

Due May 2012
2012. VIII, 348 p. 147 illus., 77 in color. (Understanding Complex Systems) Hardcover
- approx. *€ (D) 127,33 | € (A) 130,90 | sFr 171,00
- € 119,00 | £107.50
ISBN 978-3-642-29328-3
B. Calvo, E. Peña, University of Zaragoza, Spain (Eds)

**Patient-Specific Computational Modeling**

This book addresses patient-specific modeling. It integrates computational modeling, experimental procedures, imagine clinical segmentation and mesh generation with the finite element method (FEM) to solve problems in computational biomechanics and bioengineering. Specific areas of interest include cardiovascular problems, ocular and muscular systems and soft tissue modeling. Patient-specific modeling has been the subject of serious research over the last seven years and interest in the area is continually growing and this area is expected to further develop in the near future.

**Features**
- Includes new numerical algorithms for clinical applications
- Points out future directions of computational modeling for clinical applications
- Contains application examples to solve bioengineering problems

**Contents**

**Fields of interests**
Biomedical Engineering; Theoretical and Applied Mechanics; Health Informatics

**Target groups**
Research

**Product category**
Monograph

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S. Chakrabartty, Michigan State University, East Lansing, MI, USA

**CMOS Integrated Circuits for Self-powered and Energy-scavenging Systems**

This book describes the fundamental principles of designing integrated circuits used for sensors that operate by scavenging energy from the environment.

**Features**
- Describes fundamentals of energy scavenging, using concepts from different engineering disciplines and unifying them from the perspective of an electrical engineer
- Presents examples of CMOS circuits used in energy scavenging and discusses their performance limitations
- Includes case studies of energy harvesting integrated circuits which have been successfully applied to biomedical engineering and structural health monitoring

**Contents**

**Fields of interests**
Circuits and Systems; Electronics and Microelectronics; Instrumentation; Energy Systems

**Target groups**
Research

**Product category**
Monograph

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J. J. Connor, Massachusetts Institute of Technology, Cambridge, MA, USA; S. Faraji, University of Massachusetts-Lowell, MA, USA

**Fundamentals of Structural Engineering**

**Features**
- Emphasizes problem-based understanding of structural behavior
- Organizes chapters by structural types
- Provides balanced, seamless treatment of both classic and contemporary computer-based analysis methods
- Offers extensive sample problems and detailed solutions to problems of structural analysis
- Cultivates intuitive thinking about structural behavior
- Incorporates input data operable with numerous widely used engineering design software packages
- Features 900 figures and graphs

**Contents**

**Fields of interests**
Structural Mechanics; Appl.Mathematics/Computational Methods of Engineering; Civil Engineering

**Target groups**
Upper undergraduate

**Product category**
Graduate/Advanced undergraduate textbook
Mechanics of Wood Machining

Wood is one of the most valuable materials for mankind, and since our earliest days wood materials have been widely used. Today we have modern woodworking machinery and tools; however, the raw wood materials available are continuously declining. Therefore we are forced to use this precious material more economically, reducing waste wherever possible. This new textbook on the “Mechanics of Wood Machining” combines the quantitative, mathematical analysis of the mechanisms of wood processing with practical recommendations and solutions.

Features
► Presents a comprehensive summary of the mechanics of wood processing ► Contributes to a better understanding of the physical phenomena of woodworking processes ► Addresses both practitioners and graduate students in wood-engineering

Contents
Mechanics of the cutting process.- Thermal loading in cutting tools.- Operating parameters of wood cutting tools.- The energy requirement of cutting.- Vibration of the tools and workpieces.- The stability of wood working tools.- Tool wear.- Surface roughness.

Fields of interests
Operating Procedures, Materials Treatment; Wood Science & Technology; Machinery and Machine Elements

Target groups
Professional/practitioner

Product category
Monograph

Exergy
Production, Cost and Renewability
Bridging the gap between concepts derived from Second Law of Thermodynamics and their application to Engineering practice, the property exergy and the exergy balance can be a tool for analyzing and improving the performance of energy conversion processes.

Features
► Includes case studies of real processes and industrial plants ► Enables readers to use exergy and thermoeconomic analysis to optimize their own processes ► Demonstrates the application of the second law of thermodynamics to engineering practices

Contents

Fields of interests
Engineering Thermodynamics, Heat and Mass Transfer; Renewable and Green Energy; Simulation and Modeling

Target groups
Research

Product category
Monograph

The Mechanics of Mechanical Watches and Clocks

“The Mechanics of Mechanical Watches and Clocks” presents historical views and mathematical models of mechanical watches and clocks. Although the mechanical clock is over three hundred years old and is still a popular luxury item today, its theory has never been examined in detail as in this book. The illustrations and computer animations are unique and have never been published before. It will be of significant interest to researchers in mechanical engineering, watchmakers and clockmakers, and people with an engineering background who are interested in mechanical watches and clocks. It will also inspire people in other science and technology fields, such as mechanical engineering, electronics engineering, to advance their designs. Professor Ruxu Du works at the Chinese University of Hong Kong, China. Assistant Professor Longhan Xie works at the South China University of Technology, China.

Features
► Unique presentation on the historical view and mathematical model of mechanical watch and clock ► Step-by-step illustration and computer animation for better understanding ► Easy to read and yet have all important details

Contents

Fields of interests
Theoretical and Applied Mechanics; Mechanical Engineering; Mechanics

Target groups
Research

Product category
Monograph

The Mechanics of Mechanical Watches and Clocks

E. Csanady, E. Magoss, University of West-Hungary Sopron, Hungary

S. de Oliveira Junior, Polytechnic School of the University of Sao Paulo, Brazil

R. Du, The Chinese University of Hong Kong, China; L. Xie, South China University of Technology, Guangzhou, China
MEMS-based Circuits and Systems for Wireless Communication

MEMS-based Circuits and Systems for Wireless Communications provides comprehensive coverage of RF-MEMS technology from device to system level.

Features
- Presents a broad overview of RF MEMS technology
- Covers MEMS devices, oscillators, filters and complete systems
- Focuses on the properties and modeling of MEMS
- Provides updated information on recent developments in the area of MEMS, circuits and systems

Contents
Part I. MEMS/MEMS Devices
- 1. Thin Film Bulk Acoustic Wave Resonators
- 2. Contour-Mode Aluminum Nitride Piezoelectric MEMS Resonators and Filters
- 4. Future Trends in Acoustic RF MEMS Devices
- Part II: MEMS-based Circuits
- 5. The Design of Low-power High-Q Oscillators
- 6. 5.4 GHz 0.35μm BiCMOS FBAR-based Single-ended and Balanced Oscillators in Above-IC Technology
- 7. Low Power Quadrature Oscillator Design Using BAW Resonators
- 8. Tunable BAW Filters
- Part III: MEMS-based Systems
- 9. A MEMS-enabled Two-receiver Chipset for Asynchronous Networks
- 10. A 2.4 GHz Narrowband MEMS-based Radio
- 11. ADigitally Controlled FBAR Frequency Reference

Fields of interests
Circuits and Systems; Microwaves, RF and Optical Engineering; Communications Engineering; Networks

Target groups
Professional/practitioner

Product category
Professional book

Implementing Software Defined Radio

Software Defined Radio makes wireless communications easier, more efficient, and more reliable. This book bridges the gap between academic research and practical implementation. When beginning a project, practicing engineers, technical managers, and graduate students can save countless hours by considering the concepts presented in these pages. The author covers the myriad options and trade-offs available when selecting an appropriate hardware architecture. As demonstrated here, the choice between hardware- and software-centric architecture can mean the difference between meeting an aggressive schedule and bogging down in endless design iterations. Because of the author's experience overseeing dozens of failed and successful developments, he is able to present many real-life examples.

Features
- Discusses practical aspects of SDR implementation
- Covers software and hardware development paradigms suitable for development
- Presents real-live examples of prototype and field radios as well as examples from commercial, military, and the aerospace industry

Contents
What Is a Radio?.
- What Is a Software Defined Radio?.
- Why SDR?.
- Disadvantages of SDR.
- Signal Processing Devices.
- Signal Processing Architectures.
- SDR Standardization.
- Software-centric SDR Platforms.
- Radio Frequency Front End Architectures.
- State-of-the-Art SDR Components.
- Development Tools and Flows.

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

Target groups
Research

Product category
Monograph

Introduction to the Mechanics of Deformable Solids

Bars and Beams

Introduction to the Mechanics of Deformable Solids: Bars and Beams introduces the theory of beams and bars, including axial, torsion, and bending loading and analysis of bars that are subjected to combined loadings, including resulting complex stress states using Mohr’s circle. The book provides failure analysis based on maximum stress criteria and introduces design using models developed in the text. Throughout the book, the author emphasizes fundamentals, including consistent mathematical notation.

Features
- Features a highly visual pedagogy that emphasizes how visual representation of models leads to mathematical models
- Pays careful attention to the history of mechanics and includes a historical chapter
- Includes a separate chapter on structural design
- Maintains congruity of notation and approach to all mechanics models
- Features 200 illustrations

Contents
A Short History of Mechanics.
- Theory of Uniaxial Bars.
- Theory of Cylindrical Bars Subjected to Torsion.
- Theory of Beams.
- Stress and Failure Analysis.
- Introduction to Structural Design.
- Appendix Mechanical Properties of Structural Materials

Fields of interests
Structural Mechanics; Theoretical and Applied Mechanics; Continuum Mechanics and Mechanics of Materials

Target groups
Upper undergraduate

Product category
Undergraduate textbook
F. Hartmann, University of Kassel, Germany

Green’s Functions and Finite Elements

This book elucidates how Finite Element methods look like from the perspective of Green’s functions, and shows new insights into the mathematical theory of Finite Elements. Practically, this new view on Finite Elements enables the reader to better assess solutions of standard programs and to find better model of a given problem. The book systematically introduces the basic concepts how Finite Elements fulfill the strategy of Green’s functions and how approximating of Green’s functions. It discusses in detail the discretization error and shows that are coherent with the strategy of “goal oriented refinement”. The book also gives much attention to the dependencies of FE solutions from the parameter set of the model.

Features

- Combines a classical mathematical tool with the standard Finite Element Methods
- Gives new insights to the Finite Element methods
- Help to find the best Finite Element model to a given problem

Contents

- Basic concepts.
- Finite elements and Green's function.
- The discretization error.
- Modeling error.

Fields of interests

- Continuum Mechanics and Mechanics of Materials
- Computational Mathematics and Numerical Analysis
- Structural Mechanics

Target groups

- Research

Product category

- Monograph

Due July 2012

2012. XII, 310 p. 148 illus. Hardcover

- € (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00

ISBN 978-3-642-29522-5

B. L. Hoskins, J. A. Milke, University of Maryland, College Park, MD, USA

Study of Movement Speeds Down Stairs

The Study of Movement Speeds Down Stairs closely examines forty-three unique case studies on movement patterns down stairwells. These studies include observations made during evacuation drills, interviews with people after fire evacuations, and detailed results from laboratory studies. The methodology used in each study for calculating density and movement speed, when known, are also presented, and this book identifies an additional seventeen variables linked to altering movement speeds. The Study of Movement Speeds Down Stairs is intended for researchers as a reference guide for evaluating pedestrian evacuation dynamics down stairwells. Practitioners working in a related field may also find this book invaluable.

Contents

- Study Types.
- Measurement Methods.
- Additional Variables.
- Summary.
- Appendix A: Details of Previous Studies.

Fields of interests

- Civil Engineering
- Behavioural Sciences
- Statistical Physics
- Dynamical Systems and Complexity

Target groups

- Research

Product category

- Brief

Due May 2012

2012. X, 72 p. 3 illus., 1 in color. (SpringerBriefs in Fire) Softcover

- € (D) 42,75 | € (A) 43,95 | sFr 53,50
- € 39,95 | £35.99

ISBN 978-1-4614-3972-1

P. Hu, N. Ma, L.-z. Liu, Y.-g. Zhu, Dalian University of Technology, China

Theories, Methods and Numerical Technology of Sheet Metal Cold and Hot Forming

Analysis, Simulation and Engineering Applications

Over the last 15 years, the application of innovative steel concepts in the automotive industry has increased steadily. Numerical simulation technology of hot forming of high-strength steel allows engineers to optimize the formability of hot forming steel models and to optimize die design schemes.

Features

- Combines a number of key areas related to sheet metal forming
- Gives practical applications for the automotive industry
- Provides various calculation methods of cold and hot forming

Contents

1. The introduction of sheet metal forming technology.
2. The basics and equipments of sheet metal forming.
3. Hot forming process.
4. The basic mechanical properties and experimental verification for hot forming steel.
5. The basic theory and constitutive equation of high strength steel for hot forming.
6. Microscopic constitutive models of single crystal and polycrystal.
7. Hot forming simulation algorithms of high strength steels.
8. Numerical Simulation of high strength steel plate’s hot forming.
10. Simulation and optimization on service performance of hot forming parts.

Fields of interests

- Automotive Engineering
- Metallic Materials
- Computer-Aided Engineering (CAD, CAE) and Design

Target groups

- Research

Product category

- Monograph

Due June 2012


- approx. € (D) 139,05 | € (A) 142,95 | sFr 186,50
- approx. € 129,95 | £99.95


Due May 2012

2012. X, 72 p. 3 illus., 1 in color. (SpringerBriefs in Fire) Softcover

- € (D) 42,75 | € (A) 43,95 | sFr 53,50
- € 39,95 | £35.99

ISBN 978-1-4614-3972-1
Congestion Control in Data Transmission Networks

Sliding Mode and Other Designs

Congestion Control in Data Transmission Networks details the modeling and control of data traffic in communication networks.

**Features**
- Broad literature overview give the reader a solid background on the evolution of congestion control techniques in the history of modern networking
- Numerous examples facilitate understanding of the key aspects of data flow regulation in communication networks
- Through discussion of unique modeling solutions enable the designer to apply advanced techniques of control theory to network analysis and protocol upgrade
- A separate chapter is provided to familiarize the reader with the design methods and characteristics of sliding-mode control

**Contents**


**Fields of interests**

Control; Computer Communication Networks; Communications Engineering, Networks

**Target groups**

Research

**Product category**

Monograph

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**Quantifying Quality Aspects of Multimodal Interactive Systems**

This book systematically addresses the quantification of quality aspects of multimodal interactive systems. The conceptual structure is based on a schematic view on human-computer interaction where the user interacts with the system and perceives it via input and output interfaces. Thus, aspects of multimodal interaction are analyzed first, followed by a discussion of the evaluation of output and input and concluding with a view on the evaluation of a complete system.

**Features**
- Addresses systematically the quantification of quality aspects of multimodal interactive systems
- Analyzes the user interaction and the user perception via input and output interfaces
- Evaluates the complete system

**Contents**


**Fields of interests**

Signal, Image and Speech Processing; User Interfaces and Human Computer Interaction

**Target groups**

Research

**Product category**

Monograph
New Perspectives on Computational and Cognitive Strategies for Word Sense Disambiguation

Cognitive and Computational Strategies for Word Sense Disambiguation examines cognitive strategies by humans and computational strategies by machines for WSD in parallel. Focusing on a psychologically valid property of words and senses, author Oi Yee Kwong discusses their concreteness or abstractness and draws on psycholinguistic data to examine the extent to which existing lexical resources resemble the mental lexicon as far as the concreteness distinction is concerned. The text also investigates the contribution of different knowledge sources to WSD in relation to this very intrinsic nature of words and senses.

Features
► Addresses the cognitive and computational models of WSD in parallel for their mutual validation and advancement
► Informs lexical resource construction, suggesting additional sense organization with psycholinguistic evidence
► Explores potential for synergy of computer science and psychology for improving WSD in natural language applications

Contents
Word Senses and Problem Definition.
- Methods for Automatic WSD.
- Lessons Learned from Evaluation.
- The Psychology of WSD.
- Sense Concreteness and Lexical Activation.
- Lexical Sensitivity of WSD: An Outlook.

Fields of interests
Signal, Image and Speech Processing; Communications Engineering; Networks; User Interfaces and Human Computer Interaction

Target groups
Research

Product category
Brief

Due June 2012
► € (D) 53,45 | € (A) 54,95 | sFr 66,50
► € 41,95 | £39.99
ISBN 978-1-4614-1319-6

Robot Mechanisms

This book provides a comprehensive introduction to the area of robot mechanisms, primarily considering industrial manipulators and humanoid arms. The book is intended for both teaching and self-study. Emphasis is given to the fundamentals of kinematic analysis and the design of robot mechanisms. The coverage of topics is unique. The focus is on robot kinematics. The book creates a balance between theoretical and practical aspects in the development and application of robot mechanisms, and includes the latest achievements and trends in robot science and technology.

Features
► Latest results in an active field
► Balance between theory and practice
► Recommended supplementary course text

Contents
Kinematics of Rigid Bodies.
- Mechanisms.
- Serial Mechanisms.
- Evaluation of Mechanisms.
- Singular Planes and Dextrous Robot Mechanisms.
- Redundant Mechanisms.
- Parallel Mechanisms.
- Robot Contact.
- Robot Grasp.
- Kinematic Model of the Human Hand.
- Index.

Fields of interests
Robotics and Automation; Applications of Mathematics; Mechanics

Target groups
Research

Product category
Graduate/Advanced undergraduate textbook

Due August 2012
► € (D) 80,20 | € (A) 82,45 | sFr 100,00
► € 74,95 | £67.99
ISBN 978-3-642-21452-1

Advanced Control of Wheeled Inverted Pendulum Systems

Advanced Control of Wheeled Inverted Pendulum Systems is an orderly presentation of recent ideas for overcoming the complications inherent in the control of wheeled inverted pendulum (WIP) systems, in the presence of uncertain dynamics, nonholonomic kinematic constraints as well as underactuated configurations. The text leads the reader in a theoretical exploration of problems in kinematics, dynamics modeling, advanced control design techniques and trajectory generation for WIPs. An important concern is how to deal with various uncertainties associated with the nominal model, WIPs being characterized by unstable balance and unmodelled dynamics and being subject to time-varying external disturbances for which accurate models are hard to come by.

Features
► Shows the reader current ideas on wheeled mobile robot control
► Gives the investigator a self-contained guide to the mobile version of a standard control test system
► Shows the reader how to actualize concepts of nonlinear control in a real system

Contents
Mathematical Preliminaries.
- Modeling of the MWIP System.
- Path Planning and Motion Generation.
- Linear Control Methods.
- Nonlinear Control Methods.
- Model-reference Adaptive Control.
- Model-free Intelligent Control.
- Learning Impedance Control.
- Conclusions and Perspectives.

Fields of interests
Control; Robotics and Automation; Artificial Intelligence (incl. Robotics)

Target groups
Research

Product category
Monograph

Due July 2012
2012. XIV, 270 p. 97 illus., 26 in color. Hardcover
► approx. € (D) 106,95 | € (A) 109,95 | sFr 143,50
► approx. £99.95 | £90.00
Stochastic Averaging and Stochastic Extremum Seeking

Stochastic Averaging and Extremum Seeking treats methods inspired by attempts to understand the seemingly non-mathematical question of bacterial chemotaxis and their application in other environments.

Features
- For engineers the text develops a stochastic version of increasingly popular deterministic extremum-seeking algorithms
- Demonstrates to the mathematician how stochastic averaging theory can be used as a tool for studying stability rather than just approximation
- Stochastic algorithms are intuitive and connect with the huge field of stochastic optimization
- Shows how control ideas derived from study of a biological system can be generalized into other widely-different fields of application

Contents
Stochastic Averaging for Asymptotic Stability
- Stochastic Averaging for Practical Stability
- Single-parameter Stochastic Extremum Seeking
- Stochastic Source Seeking for Nonholonomic Vehicles
- Stochastic Source Seeking with Tuning of Forward Velocity
- Multi-parameter Stochastic Extremum Seeking and Slope Seeking
- Stochastic Nash Equilibrium Seeking for Games with General Nonlinear Payoffs
- Nash Equilibrium Seeking for Quadratic Games and Application to Oligopoly Markets and Vehicle Deployment
- Newton-based Stochastic Extremum Seeking

Fields of interests
Control; Calculus of Variations and Optimal Control; Optimization; Game Theory/Mathematical Methods

Target groups
Research

Product category
Monograph

Due July 2012
2012. XII, 260 p. 45 illus., 29 in color.
(Communications and Control Engineering)
Hardcover
► € (D) 85,55 | € (A) 87,95 | sFr 106,50
► € 79,95 | £72.00

Due June 2012
Hardcover
► € (D) 106,95 | € (A) 109,95 | sFr 133,50
► € 99,95 | £90.00

Due April 2012
2012. VIII, 176 p. 35 illus.
(CISM International Centre for Mechanical Sciences, Volume 538)
Hardcover
► € (D) 96,25 | € (A) 98,95 | sFr 120,00
► € 89,95 | £81.00
ISBN 978-3-7091-1226-1

Multiphase microfluidics: The diffuse interface model

Multiphase flows are typically described assuming that the different phases are separated by a sharp interface, with appropriate boundary conditions. This approach breaks down whenever the length-scale of the phenomenon that is being studied is comparable with the real interface thickness, as it happens, for example, in the coalescence and breakup of bubbles and drops, the wetting and dewetting of solid surfaces and, in general, im micro-devices. The diffuse interface model resolves these problems by assuming that all quantities can vary continuously, so that interfaces have a non-zero thickness, i.e. they are “diffuse”. The contributions in this book review the theory and describe some relevant applications of the diffuse interface model for one-component, two-phase fluids and for liquid binary mixtures, to model multiphase flows in confined geometries.

Features
- Only book describing the application of the diffuse interface method to multiphase flow modeling
- Application to micro-engineering is stressed
- Interfacial phenomena are explained from first principles

Contents
Diffuse interface (D.I.) model for multiphase flows
- Phase separation of viscous ternary liquid mixtures
- Dewetting and decomposing films of simple and complex liquids

Fields of interests
Engineering Thermodynamics, Heat and Mass Transfer; Engineering Fluid Dynamics; Nanotechnology and Microengineering

Target groups
Research

Product category
Monograph

ISBN 978-3-7091-1226-1

R. Mauri, University of Pisa, Italy (Ed)

Multiphase Microfluidics: The Diffuse Interface Model
Creating Shared Understanding in Product Development Teams

How to 'Build the Beginning'

Development projects that span different disciplines and groups often face problems in establishing a shared understanding of the project's purpose, deliverables, and direction. Creating Shared Understanding in Product Development Teams: How to 'Build the Beginning' uses research-based cases from TC Electronic, The Red Cross, Daimler AG, and Copenhagen Living Lab to demonstrate one approach to this problem complex. It shows how prototyping specific physical artifacts can function as drivers and focal points for creating the much needed shared understanding.

Features

- Counters the waste of project resources due to ambiguity and lack of real shared understanding in the team by prototyping the project point of departure
- Provides hands-on tools to involve users and enable the entire team to identify the right user need and scope of the project from the start
- Forms a facilitation guide that not only describes and exemplifies the methods, but also provides readers with input and inspiration to plan, instruct and facilitate workshops

Contents


Fields of interests

Engineering Economics, Organization, Logistics, Marketing; Project Management; Production/Logistics/Supply Chain Management

Target groups

Professional/practitioner

Product category

Monograph

Due June 2012

2012. X, 150 p. 74 illus., 7 in color. Hardcover

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Insulation Measurement and Supervision in Live AC and DC Unearthed Systems

Low voltage unearthed (IT) AC and DC systems are commonly applied for supply of power and control circuits in industry, transportation, medical objects etc. The main reasons for their use are high reliability and numerous advantages offered by isolating them against ground. Insulation level is a decisive factor for networks operational reliability and safety. Insufficient insulation-to-ground resistance can cause various disturbances. Though ground faults in IT systems do not make networks operation impossible, they may cause severe problems with their safe functioning. In this book the most important issues concerning normal operation and ground fault phenomena are described in concise form. Numerous methods of insulation resistance and capacitance measurement in live circuits are presented.

Features

- Provides insight into important issues concerning AC and DC IT systems incl. a basic theory of operation caused by ground insulation deterioration
- Presents practical methods of insulation resistance and capacitance measurement in live networks with derivation of formulas
- Presents commonly used monitoring devices and systems and an explanation of their settings selection

Contents


Fields of interests

Electronics and Microelectronics, Instrumentation; Electrical Engineering

Target groups

Research

Product category

Monograph

Due June 2012


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ISBN 978-3-642-29754-0

Multi-Objective Optimization in Physical Synthesis of Integrated Circuits

Features

- Describes physical synthesis optimization to include accurate transformations operating between the global and local scales
- Integrates groups of related transformations to break circular dependencies and increase the number of circuit elements that can be jointly optimized to escape local minima
- Derives several multi-objective optimizations from first observations through complete algorithms and experiments

Contents


Fields of interests

Circuits and Systems; Electronics and Microelectronics, Instrumentation; Nanotechnology and Microengineering

Target groups

Research

Product category

Monograph

Due May 2012

2012. VII, 164 p. 61 illus. (Lecture Notes in Electrical Engineering, Volume 166) Hardcover

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ISBN 978-1-4614-1355-4

P. Olszowiec, Elpoautomatyka Polaniec, Staszow, Poland

D. A. Papa, Broadway Technology, Austin, TX, USA; I. L. Markov, University of Michigan, Ann Arbor, MI, USA
M. Roe, University of Plymouth, UK

Maritime Governance and Policy-Making

A close analysis of the framework of existing governance and the existing jurisdictional arrangements for shipping and ports reveals that while policy-making is characterized by national considerations through flags, institutional representation at all jurisdictions and the inviolability of the state, the commercial, financial, legal and operational environment of the sector is almost wholly global. This governance mismatch means that in practice the maritime industry can avoid policies which it dislikes by trading nations off against one another, while enjoying the freedoms and benefits of a globalized economy. A Post-modern interpretation of this globalized society prompts suggestions for change in maritime policy-making so that the governance of the sector better matches more closely the environment in which shipping and ports operate.

Features
► Comments on the record of policy-making in the maritime sector and assesses whether the reason for continued policy failure rests with the inadequate governance of the sector ► Focuses upon the inconsistency between an industry dominated by national interests ► Suggests ways in which this could be achieved to better match policy-making and its application to a globalized world

Contents

Fields of interests
Engineering Economics, Organization, Logistics, Marketing; International Economics; Transportation

Target groups
Research

Product category
Monograph

K. Sandrasegaran, L. Wu, University of Technology, Sydney, NSW, Australia

A Study on Radio Access Technology Selection Algorithms

This book discusses the basic idea of Common Radio Resource Management (CRRM), especially on the Radio Access Technologies selection part of CRRM. It introduces two interaction functions (information reporting function and RRM decision support function) and four interaction degrees (from low to very high) of CRRM. Four possible CRRM topologies (CRRM server, integrated CRRM, Hierarchical CRRM, and CRRM in user terminals) are described. The book presents different Radio Access Technologies selection algorithms, including single criterion and multiple criteria based algorithms are presented and compares them. Finally, the book analyses the advantages and disadvantages of the different selection algorithms.

Contents

Fields of interests
Communications Engineering, Networks; Information Storage and Retrieval; Signal, Image and Speech Processing

Target groups
Research

Product category
Brief

K.-H. Schwalbe, Lüneburg, Germany; I. Scheider, A. Cornec, Helmholtz-Zentrum Geesthacht, Germany

Guidelines for Applying Cohesive Models to the Damage Behaviour of Engineering Materials and Structures

This brief provides guidance for the application of cohesive models to determine damage and fracture in materials and structural components. This can be done for configurations with or without a pre-existing crack. Although the brief addresses structural behaviour, the methods described herein may also be applied to any deformation induced material damage and failure, e.g. those occurring during manufacturing processes. The methods described are applicable to the behaviour of ductile metallic materials and structural components made thereof. Hints are also given for applying the cohesive model to other materials.

Feature
► Describes guidelines for the application of cohesive models to the evolution of damage in materials

Contents

Fields of interests
Continuum Mechanics and Mechanics of Materials; Characterization and Evaluation of Materials; Numerical Analysis

Target groups
Research

Product category
Brief
Markov Networks in Evolutionary Computation

Markov networks and other probabilistic graphical models have recently received an upsurge in attention from Evolutionary computation community, particularly in the area of Estimation of distribution algorithms (EDAs). EDAs have arisen as one of the most successful experiences in the application of machine learning methods in optimization, mainly due to their efficiency to solve complex real-world optimization problems and their suitability for theoretical analysis. This book focuses on the different steps involved in the conception, implementation and application of EDAs that use Markov networks, and undirected models in general.

Features
- Offers a systematic presentation of the use of Markov Networks in Evolutionary Computation
- Fills a void in the current literature on the application of PGMs in evolutionary optimization
- Written by leading experts in the field

Contents

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics); Game Theory/Mathematical Methods

Target groups
Research

Product category
Monograph

Due April 2012
2012. XII, 246 p. (Adaptation, Learning, and Optimization, Volume 14) Hardcover
- * € (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00
ISBN 978-3-642-28899-9

Free Convection Film Flows and Heat Transfer
Laminar free Convection of Phase Flows and Models for Heat-Transfer Analysis

Contents

Part II – Laminar Free Convection.

Fields of interests
Engineering Thermodynamics, Heat and Mass Transfer; Thermodynamics; Applied and Technical Physics

Target groups
Research

Product category
Monograph

Due September 2012
2nd ed. 2013. Approx. 500 p. 104 illus., 21 in color. (Heat and Mass Transfer, 0) Hardcover
- * € (D) 139,05 | € (A) 142,94 | sFr 173,00
- € 129,95 | £117.00
ISBN 978-3-642-28982-8

Smart Grid and NFPA Electrical Safety Codes and Standards

Smart Grid and NFPA Electrical Safety Codes and Standards closely examines the National Fire Protection Association safety codes and standards that currently regulate smart grid technologies. Presented through a series of project tasks, this book analyzes the existing codes, and outlines suggestions for amending them, in order to improve smart grid technology. Smart Grid and NFPA Electrical Safety Codes and Standards is intended for practitioners as a reference guide to smart grid technologies and the NFPA’s safety regulations.

Researchers working in a related field will also find the book valuable.

Contents

Fields of interests
Energy Technology; Civil Engineering; Power Electronics, Electrical Machines and Networks

Target groups
Professional/practitioner

Product category
Brief

Due May 2012
2011. XV, 95 p. 7 illus. in color. (SpringerBriefs in Fire) Softcover
- * € (D) 42,75 | € (A) 43,95 | sFr 53,50
- € 39,95 | £35.99
Advanced Concepts in Fuzzy Logic and Systems with Membership Uncertainty

This book generalizes fuzzy logic systems for different types of uncertainty, including semantic ambiguity resulting from limited perception or lack of knowledge about exact membership functions; lack of attributes or granularity arising from discretization of real data; imprecise description of membership functions; vagueness perceived as fuzzification of conditional attributes. Consequently, the membership uncertainty can be modeled by combining methods of conventional and type-2 fuzzy logic, rough set theory and possibility theory.

Features
- Original research on type-2 fuzzy set theory
- The book generalizes fuzzy logic systems for different types of uncertainty and sets new trends in handling of uncertainty with as simple as possible formulations of proposed type-2 and rough-fuzzy methods
- Written by a leading expert in the field

Contents

Fields of interests
Computational Intelligence; Simulation and Modeling; Engineering Design

Target groups
Research

Product category
Monograph

Supervised Learning with Complex-valued Neural Networks

Recent advancements in the field of telecommunications, medical imaging and signal processing deal with signals that are inherently time varying, nonlinear and complex-valued. The time varying, nonlinear characteristics of these signals can be effectively analyzed using artificial neural networks.

Features
- This book covers recent developments and applications in the area of complex-valued neural networks
- The book especially addresses researchers and engineers working in the areas of neural networks, communications and signal processing, and also researchers working in the areas of image processing especially in medical image processing
- Written by leading experts in the field

Contents

Fields of interests
Computational Intelligence; Signal, Image and Speech Processing

Target groups
Research

Product category
Monograph

Ultrasonic Doppler Velocity Profiler for Fluid Flow

The ultrasonic velocity profile (UVP) method, first developed in medical engineering, is now widely used in clinical settings. The fluid mechanical basis of UVP was established in investigations by the author and his colleagues with work demonstrating that UVP is a powerful new tool in experimental fluid mechanics. There are diverse examples, ranging from problems in fundamental fluid dynamics to applied problems in mechanical, chemical, nuclear, and environmental engineering.

Features
- Textbook for Ultrasonic Doppler Velocimetry (UVP)
- Covers ultrasonic for fluid flow and ultrasonic Doppler method
- Describe principle to practice, with various reference data sheets and hints for successful application of this technique to a range of flow configurations

Contents

Fields of interests
Engineering Fluid Dynamics; Mechanical Engineering; Industrial Chemistry/Chemical Engineering

Target groups
Professional/practitioner

Product category
Monograph
I. Takewaki, Kyoto University, Japan; A. Moustafa, Minia University, Egypt; K. Fujita, Kyoto University, Japan

Improving the Earthquake Resilience of Buildings

The worst case approach

Contents

Fields of interests
Building Construction; Geotechnical Engineering & Applied Earth Sciences; Geoengineering, Foundations, Hydraulics

Target groups
Research

Product category
Monograph

P. Thollander, J. Palm, Linköping University, Sweden

Improving Energy Efficiency in Industrial Energy Systems
An Interdisciplinary Perspective on Barriers, Energy Audits, Energy Management, Policies, and Programs

Industrial energy efficiency is one of the most important means of reducing the threat of increased global warming.

Features
▶ Re considers the traditional view of studying industrial energy efficiency in both a barrier perspective and a STS-perspective ▶ Presents the theoretical baselines and implications for both research and policy of how industrial energy efficiency might be addressed ▶ Combines engineering and social science approaches to enhance readers’ understanding of industrial energy efficiency and broaden their perspective on policy making in the area

Contents

Fields of interests
Renewable and Green Energy; Energy Efficiency (incl. Buildings); Industrial Organization

Target groups
Research

Product category
Monograph

V. Vittal, R. Ayyanar, Arizona State University, Tempe, AZ, USA

Grid Integration and Dynamic Impact of Wind Energy

Grid Integration and Dynamic Impact of Wind Energy details the integration of wind energy resources to the electric grid worldwide. Authors Vijay Vittal and Raja Ayyanar include detailed coverage of the power converters and control used in interfacing electric machines and power converters used in wind generators, and extensive descriptions of power systems operation and control to accommodate large penetration of wind resources. Key concepts will be illustrated through extensive power electronics and power systems simulations using software like MATLAB, Simulink and PLECS.

Features
▶ Offers a multidisciplinary approach to implementing wind energy, using power electronics, electric machines, power systems operation, design and control theories ▶ Addresses real world problems facing grid integration of wind through several examples and simulations ▶ Closely analyzes wind generators, power electronics and control in relation to electric grid performance, with suggestions for improvements

Contents

Fields of interests
Energy Technology; Renewable and Green Energy; Power Electronics, Electrical Machines and Networks

Target groups
Research

Product category
Monograph
W. Wang, P. Mishra, S. Ranka, University of Florida, Gainesville, FL, USA

**Dynamic Reconfiguration in Real-Time Systems**

**Energy, Performance, and Thermal Perspectives**

Given the widespread use of real-time multitasking systems, there are tremendous optimization opportunities if reconfigurable computing can be effectively incorporated while maintaining performance and other design constraints of typical applications. The focus of this book is to describe the dynamic reconfiguration techniques that can be safely used in real-time systems.

**Features**
- Provides a comprehensive introduction to optimization and dynamic reconfiguration techniques in real-time embedded systems
- Covers state-of-the-art techniques and ongoing research in reconfigurable architectures
- Focuses on algorithms tuned for dynamic reconfiguration techniques in real-time systems
- Provides reference for anyone designing low-power systems, energy-/temperature-constrained devices, and power-performance efficient systems which execute tasks with timing constraints

**Contents**
- Introduction.
- Energy-Aware Scheduling with Dynamic Voltage Scaling.
- System-wide Energy Optimization with DVS and DCR.
- Temperature- and Energy-Constrained Scheduling.

**Fields of interests**
- Circuits and Systems; Processor Architectures; Energy, general

**Target groups**
- Research

**Product category**
- Monograph

**Due May 2012**

2012. XIV, 213 p. 95 illus. (Embedded Systems, Volume 4) Hardcover
- *€ (D) 106,95 | € (A) 109,95 | sFr 133,50
- *€ 99,95 | £90.00
ISBN 978-1-4614-0277-0

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E. Wittbrodt, Gdańsk University of Technology, Poland; M. Szczotka, A. Maczyński, S. Wojciech, University of Bielsko-Biała, Poland

**Rigid Finite Element Method in Analysis of Dynamics of Offshore Structures**

This book describes new methods developed for modelling dynamics of machines commonly used in the offshore industry. These methods are based both on the rigid finite element method, used for the description of link deformations, and on homogeneous transformations and joint coordinates, which is applied to the modelling of multibody system dynamics. In this monograph, the bases of the rigid finite element method and homogeneous transformations are introduced. Selected models for modelling dynamics of offshore devices are then verified both by using commercial software, based on the finite element method, as well as by using additional methods.

**Features**
- Advances in offshore technology
- The book introduces selected problems related to offshore technology and describes methods for modelling dynamics of machines commonly used in the offshore industry
- Written by leading experts

**Contents**
- From the content: Introduction.
- Overview of Selected Problems in Offshore Technology.
- Impact of Water on Offshore Structures and Infrastructure.
- Homogeneous Transformations and Joint Coordinates in the Description of Geometry of Multibody Systems.
- Equations of Motion of Systems with Rigid Links.
- Modelling of Joining Elements. Constraint Equations.

**Fields of interests**
- Mechanical Engineering; Computational Science and Engineering

**Target groups**
- Research

**Product category**
- Monograph

**Due July 2012**

2012. Approx. 290 p. (Ocean Engineering & Oceanography, Volume 1) Hardcover
- *€ (D) 106,95 | € (A) 109,95 | sFr 133,50
- *€ 99,95 | £90.00
ISBN 978-3-642-29885-1
T. Woo, Seoul National University, Korea

Atomic Information Technology
Safety and Economy of Nuclear Power Plants

Features
- Illustrates the range of information technology aspects in nuclear power plants (NPPs)
- Considers the statistical methods and economic and safety studies which are currently used to evaluate their shortcomings
- Provides a resource to be used with conventional nuclear safety and reliability books as a reference for students and practitioners alike

Contents
1. Introduction
2. Dynamical modeling of economy in global nuclear energy market
3. Assessment of national nuclear fuel cycle for transmutations of high level nuclear waste (HLW)
4. Dynamical management of atomic-multinuclear (AM) in the aspect of energy policy
5. Technological management of atomic-multinuclear (AM) by social network theory
6. Nuclear safety assessment for the passive system of the nuclear power plants (NPPs) in safety margin estimation
7. Non-linear dynamical reliability analysis in the Very High Temperature Gas Cooled Reactor
8. Dynamical seismic probabilistic safety assessment (PSA) for earthquake
9. Safety assessment for lunar nuclear power reactor (LNPR) in accident of cooling loop failure (ACLF)
10. Nuclear safeguard management of operation security in nuclear power plants (NPPs)
11. Life extension assessment for safeguard in nuclear power plants (NPPs) using a production function
12. Security investigations in nuclear materials using analytic pair values
13. Nuclear security assessment using loss function with modified random numbers
14. Conclusion

Fields of interests
Nuclear Engineering, Energy Policy, Economics and Management, Management of Computing and Information Systems

Target groups
Research

Product category
Monograph

X.-S. Yang, National Physical Laboratory, Teddington, UK (Ed)

Artificial Intelligence, Evolutionary Computing and Metaheuristics
In the footsteps of Alan Turing

Alan Turing pioneered many research areas such as artificial intelligence, computational, heuristics and pattern formation. Nowadays at the information age, it is hard to imagine how the world would be without computers and the Internet. Without Turing’s work, especially the core concept of Turing Machine at the heart of every computer, mobile phone and microchip today, so many things on which we are so dependent would be impossible.

Features
- Highlights the most recent progress in artificial intelligence, evolutionary computing and metaheuristics
- Carefully edited book on the occasion of the Alan Turing year -- a centenary celebration of the life and work of Alan Turing
- Written by leading experts in the field

Contents
From the content: Turing Test as a Defining Feature of Artificial Intelligence Evolved from Random Behaviour
- Turing: Then, Now and Still Key
- Imagination Programming Unorganised Machines
- Towards Machine Equivalent Consciousness
- Multi-criteria Models for Learning Ordinal Data: a literature review
- Diophantine and Lattice Cryptanalysis of the RSA Cryptosystem
- Artificial Intelligence Methods in Early Childhood Education

Fields of interests
Computational Intelligence; Artificial Intelligence (incl. Robotics); Computer Imaging, Vision, Pattern Recognition and Graphics

Target groups
Research

Product category
Monograph

Y. Yuan, ZTE Inc., Beijing, China

LTE-Advanced relay technology and standardization

LTE-Advanced relay technology and standardization provides a timely reference work for relay technology with the finalizing of LTE Release 10 specifications. LTE-Advanced is quickly becoming the global standard for 4G cellular communications. The relay technology, as one of the key features in LTE-Advanced, helps not only to improve the system coverage and capacity, but also to save the costs of laying wireline backhaul. As a leading researcher in the field of LTE-Advanced standards, the author provides an in-depth description of LTE-A relay technology, and explains in detail the standard specification and design principles. Readers from both academic and industrial fields can find sections of interest to them: Sections 2 & 4 could benefit researchers in academia and those who are engaged in exploratory work, while Sections 3 & 4 are more useful to engineers.

Features
- The first book with in-depth description and insight of LTE-Advanced relay technology
- A new angle to understand Release 10 relay -- in the context of heterogeneous networks
- Long lasting value for reference, discussion of the outlook of relay in future releases

Contents
Introduction
- LTE-A Relay Scenarios and Evaluation Methodology
- LTE-A Relay Study and Related Technologies
- Physical Layer Standardization of Release 10 Relay
- Higher Layer Aspects and RAN4 Performance Aspects
- Implementation Aspects of Release 10 Relay
- Outlook of Relay in Future LTE Releases

Fields of interests
Communications Engineering, Networks, Circuits and Systems, System Performance and Evaluation

Target groups
Research

Product category
Professional book

Due May 2012
2012. XII, 181 p. 117 illus. (Springer Series in Reliability Engineering) Hardcover
- € (D) 106,95 | € (A) 109,95 | sFr 133,50
- € 99,95 | £90.00
ISBN 978-1-4471-4029-0

Due June 2012
2012. Approx. 810 p. (Studies in Computational Intelligence, Volume 427) Hardcover
- * € (D) 213,95 | € (A) 219,94 | sFr 266,50
- approx. € 199,95 | £180.00
ISBN 978-3-642-29693-2

Due July 2012
2012. XIII, 199 p. 135 illus. in color. (Signals and Communication Technology) Hardcover
- * € (D) 96,25 | € (A) 98,95 | sFr 120,00
- approx. € 89,95 | £81.00
ISBN 978-3-642-29675-3
**Image-Based Geometric Modeling and Mesh Generation**

**Contents**

**Fields of interests**
Mechanical Engineering; Computational Science and Engineering; Biomedical Engineering

**Target groups**
Research

**Product category**
Contributed volume

Due August 2012

2013. 300 p. 60 illus. (Lecture Notes in Computational Vision and Biomechanics, Volume 3)
Hardcover
► approx. *€ (D) 106,95 | € (A) 109,95 | sFr 143,50
► approx. € 99,95 | £90.00
ISBN 978-94-007-4254-3

**Design and Testing of Digital Microfluidic Biochips**

This book provides a comprehensive methodology for automated design, test and diagnosis, and use of robust, low-cost, and manufacturable digital microfluidic systems. It focuses on the development of a comprehensive CAD optimization framework for digital microfluidic biochips that unifies different design problems. With the increase in system complexity and integration levels, biochip designers can utilize the design methods described in this book to evaluate different design alternatives, and carry out design-space exploration to obtain the best design point.

**Features**
► Describes practical design automation tools that address different design problems (e.g., synthesis, droplet routing, control-pin mapping, testing and diagnosis, and error recovery) in a unified manner
► Applies test pattern generation and error-recovery techniques for digital microfluidics-based biochips
► Uses real bioassays as evaluation examples, e.g., multiplexed in-vitro human physiological fluids diagnostics, RCR, protein crystallization

**Contents**

**Fields of interests**
Circuits and Systems; Biomedical Engineering; Electronics and Microelectronics, Instrumentation

**Target groups**
Research

**Product category**
Monograph

Due May 2012

2012. XII, 262 p. 104 illus. Hardcover
► *€ (D) 106,95 | € (A) 109,95 | sFr 133,50
► € 99,95 | £90.00