Rigidly Framed Earth Retaining Structures

Thermal soil structure interaction of buildings supporting unbalanced lateral earth pressures

Structures placed on hillsides often present a number of challenges and a limited number of economical choices for site design. An option sometimes employed is to use the building frame as a retaining element, comprising a Rigidly Framed Earth Retaining Structure (RFERS). The relationship between temperature and earth pressure acting on RFERS, is explored in this monograph through a 4.5 year monitoring program of a heavily instrumented in service structure.

Features

- Latest research on Rigidly Framed Earth Retaining Structures
- Presents Soil Structure Interaction of Buildings Supporting Unbalanced Lateral Earth Pressures
- Written by leading experts in the field

Contents

Introduction to Rigidly Framed Earth Retaining Structures (RFERS).- Classical Earth Pressure Theory Related to Framed Structures.- Closed-Form Expressions for Lateral Deflection of Rigid Frames.- Case Study of a Full Scale RFERS in Service.- Relationship between Temperature and Earth Pressure for RFERS.- Numerical Analysis of Instrumented RFERS.- Parametric Study of Earth Pressure.

Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups

Research

Product category

Monograph

Due April 2014


- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00

ISBN 978-3-642-54642-7

C. Alippi, Politecnico di Milano, Milano, Italy

Intelligence for Embedded Systems

A Methodological Approach

Addressing current issues of which any engineer or computer scientist should be aware, this monograph is a response to the need to adopt a new computational paradigm as the methodological basis for designing pervasive embedded systems with sensor capabilities. The requirements of this paradigm are to control complexity, to limit cost and energy consumption and to provide adaptation and cognition abilities allowing the embedded system to interact proactively with the real world.

Features

- A comprehensive, interdisciplinary treatment of intelligent systems, teaching the reader everything from metrology to cognition
- Shows students and engineers how to understand basic mechanisms and design advanced applications, feeding a digital world eager for intelligent mechanisms
- Introduces researchers to ideas characterizing the transition from one generation of intelligent devices to the next

Contents


Fields of interest

Electronics and Microelectronics, Instrumentation; Computational Intelligence; Special Purpose and Application-Based Systems

Target groups

Research

Product category

Monograph

Due March 2014

2014. XIX, 283 p. 81 illus., 73 in color. Hardcover

- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £117.00

ISBN 978-3-319-05277-9

A. L. Allison, Boeing Company, Boeing, WA, USA

The ITU and Managing Satellite Orbital and Spectrum Resources in the 21st Century

Access to satellite orbits and spectrum is managed by the ITU, a United Nations body that strives to extend the benefits of new technologies to the world, while ensuring equitable access to these resources. This book explores how the ITU approaches these dual missions in light of the increasing saturation of the geostationary orbit by a vibrant global satellite industry and the rising interests of developing countries in accessing these limited resources. These issues were the subject of debate at the 2012 World Radiocommunication Conference. This book describes and assesses various regulatory approaches undertaken to manage the increasing requests for access to space and especially access to spectrum and orbital locations in the geosynchronous or "The Clarke" orbit.

Feature

- Provides key insights to the ITU’s approaches to managing access to increasingly contested satellite resources while also portraying the geopolitical struggles behind the scenes

Contents

Introduction.- Background.- The Challenges.- Results and Analysis.- Conclusions and Recommendations.

Fields of interest

Aerospace Technology and Astronautics; Law of the Sea, Air and Outer Space; Communications Engineering, Networks

Target groups

Professional/practitioner

Product category

Brief

Due May 2014

2014. X, 100 p. 22 illus., 17 in color. (SpringerBriefs in Space Development) Softcover

- € (D) 53,49 | € (A) 54,99 | sFr 67,00
- € 49,99 | £44.99

ISBN 978-3-319-05313-4

Addressing current issues of which any engineer or computer scientist should be aware, this monograph is a response to the need to adopt a new computational paradigm as the methodological basis for designing pervasive embedded systems with sensor capabilities. The requirements of this paradigm are to control complexity, to limit cost and energy consumption and to provide adaptation and cognition abilities allowing the embedded system to interact proactively with the real world.

Features

- A comprehensive, interdisciplinary treatment of intelligent systems, teaching the reader everything from metrology to cognition
- Shows students and engineers how to understand basic mechanisms and design advanced applications, feeding a digital world eager for intelligent mechanisms
- Introduces researchers to ideas characterizing the transition from one generation of intelligent devices to the next

Contents


Fields of interest

Electronics and Microelectronics, Instrumentation; Computational Intelligence; Special Purpose and Application-Based Systems

Target groups

Research

Product category

Monograph
Chemical Optimization Algorithm for Fuzzy Controller Design

In this book, a novel optimization method inspired by a paradigm from nature is introduced. The chemical reactions are used as a paradigm to propose an optimization method that simulates these natural processes. The proposed algorithm is described in detail and then a set of typical complex benchmark functions is used to evaluate the performance of the algorithm. Simulation results show that the proposed optimization algorithm can outperform other methods in a set of benchmark functions.

Features
- Presents a Chemical Optimization Algorithm for Fuzzy Controller Design
- The novel algorithm is described in detail and then a set of typical complex benchmark functions is used to evaluate the performance of the algorithm
- Includes an application to a dynamic model of a unicycle mobile robot by integrating a kinematic and a torque controller based on fuzzy logic theory
- Computer simulations are presented confirming that this optimization paradigm is able to outperform other optimization techniques

Contents
Introduction.- Theory and Background.- Chemical Definitions.- The Proposed Chemical Reaction Algorithm.- Application Problems.- Simulation Results.- Conclusions.

Fields of interest
Computational Intelligence; Control; Theoretical and Computational Chemistry

Target groups
Research

Product category
Brief

Due April 2014

2014. VIII, 77 p. 32 illus. (SpringerBriefs in Applied Sciences and Technology / SpringerBriefs in Computational Intelligence) Softcover
- * € (D) 53,49 | € (A) 54,99 | sFr 67,00
- € 49,99 | £44.99
ISBN 978-3-319-05244-7

Due May 2014

2014. XX, 170 p. 74 illus., 3 in color. Hardcover
- * € (D) 106,99 | € (A) 109,99 | sFr 133,50
- € 99,99 | £90.00
ISBN 978-1-4939-0738-0

Due November 2014

2015. X, 165 p. 74 illus., 3 in color. (SpringerBriefs in Applied Sciences and Technology) Hardcover
- approx. * € (D) 42,79 | € (A) 43,99 | sFr 49,50
- approx. € 39,99 | £33.99
ISBN 978-3-319-05394-3
Volume I: Periodic Splines

Features
- Provides a universal toolbox accompanied by Matlab software
- Can be used as supplementary reading
- Presents a new generic approach to the wavelets and frames design

Contents
1 Introduction: Signals and transforms.
   2 Introduction: Periodic filters and filter banks.
   3 Mixed circular convolutions and Zak transforms.
   4 Periodic polynomial splines.
   5 Polynomial smoothing splines.
   6 Calculation of splines values by subdivision.
   7 Splines algorithms for deconvolution and inversion of heat equation.
   8 Periodic spline wavelets and wavelet packets.
   9 Discrete-time periodic wavelet packets.
   10 Deconvolution by regularized matching pursuit.
   11 Block-based inversion of the heat equations.
   12 Hydro-acoustic target detection.
   13 Periodic discrete splines.
   14 Discrete periodic spline wavelets and wavelet packets.
   15 Biorthogonal wavelet transforms.
   16 Biorthogonal wavelet transforms originating from splines.
   17 Wavelet frames generated by spline based p-filter banks.
   18 Application of periodic frames to image restoration.

Fields of interest
Signal, Image and Speech Processing; Computer Imaging, Vision, Pattern Recognition and Graphics; Computational Mathematics and Numerical Analysis

Target groups
Research

Product category
Monograph

Due March 2014
2014. XVIII, 185 p. 7 Illus. (Studies in Fuzziness and Soft Computing, Volume 315) Hardcover
  * € (D) 106,99 | € (A) 109,99 | sFr 133,50
  * € 99,99 | £90.00
  ISBN 978-3-319-05175-8

Visual Control of Wheeled Mobile Robots
Unifying Vision and Control in Generic Approaches

Vision-based control of wheeled mobile robots is an interesting field of research from a scientific and even social point of view due to its potential applicability. This book presents a formal treatment of some aspects of control theory applied to the problem of vision-based pose regulation of wheeled mobile robots. In this problem, the robot has to reach a desired position and orientation, which are specified by a target image. It is faced in such a way that vision and control are unified to achieve stability of the closed loop, a large region of convergence, without local minima and good robustness against parametric uncertainty.

Features
- Unifies formal aspects of control theory with concepts of computer vision to achieve good performance in the problem of visual serving of mobile robots
- Presents generic and robust visual control schemes
- Exploits the properties of geometric constraints for direct visual feedback
- All the presented control schemes are evaluated through simulations and real-world experiments using different platforms and vision systems

Contents
Introduction.
- Robust visual control based on the epipolar geometry.
- A robust control scheme based on the trifocal tensor.
- Dynamic pose-estimation for visual control.
- Conclusions.

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

Target groups
Research

Product category
Monograph

Due April 2014
2014. XII, 104 p. (Springer Tracts in Advanced Robotics, Volume 103) Hardcover
  * € (D) 90,94 | € (A) 93,49 | sFr 113,50
  * € 84,99 | £76.50
  ISBN 978-3-319-05782-8

Due May 2014
2014. XXVIII, 524 p. 185 illus., 128 in color. Hardcover
  * € (D) 181,89 | € (A) 186,99 | sFr 226,50
  * € 169,99 | £153.00
  ISBN 978-94-017-8925-7

Fuzzy Social Choice Theory

This book offers a comprehensive analysis of the social choice literature and shows, by applying fuzzy sets, how the use of fuzzy preferences, rather than that of strict ones, may affect the social choice theorems. To do this, the book explores the presupposition of rationality within the fuzzy framework and shows that the two conditions for rationality, completeness and transitivity, do exist with fuzzy preferences. Specifically, this book examines: the conditions under which a maximal set exists; the Arrow's theorem; the Gibbard-Satterthwaite theorem and the median voter theorem. After showing that a non-empty maximal set does exists for fuzzy preference relations, this book goes on to demonstrating the existence of a fuzzy aggregation rule satisfying all five Arrowian conditions, including non-dictatorship. While the Gibbard-Satterthwaite theorem only considers individual fuzzy preferences, this work shows that both individuals and groups can choose alternatives to various degrees, resulting in a social choice that can be both strategy-proof and non-dictatorial.

Features
- Presents a comprehensive analysis of fuzzy set theoretic models of social choice
- Paves the way for the development of a fuzzy social choice framework and shows that the two conditions of convergence, without local minima and good robustness against parametric uncertainty.

Contents
Introduction.
- Fuzzy aggregation rules.
- The conditions under which a maximal set exists.
- Arrow's theorem.
- Gibbard-Satterthwaite theorem.
- Non-empty maximal set.

Fields of interest
Mathematics in the Humanities and Social Sciences

Target groups
Research

Product category
Monograph

A. Z. Averbuch, Tel Aviv University, Tel Aviv, Israel;
P. Neittaanmäki, University of Jyväskylä, Jyväskylä, Finland; V. A. Zheludev, Tel Aviv University, Tel Aviv, Israel

Spline and Spline Wavelet Methods with Applications to Signal and Image Processing

M. B. Gibilisco, Rochester, NY, USA; A. M. Gowen, Papillion, NE, USA; K. E. Albert, Lincoln, NE, USA; J. N. Mordeson, M. J. Wiernan, T. D. Clark, Creighton University, Omaha, NE, USA

H. M. Becerra, Guanajuato, Mexico; C. Sagüés, Zaragoza, Spain
Advanced Takagi–Sugeno Fuzzy Systems

Delay and Saturation

This monograph puts the reader in touch with a decade’s worth of new developments in the field of fuzzy control specifically those of the popular Takagi–Sugeno (T–S) type. New techniques for stabilizing control analysis and design of are based on multiple Lyapunov functions and linear matrix inequalities (LMIs). All the results are illustrated with numerical examples and figures and a rich bibliography is provided for further investigation. Control saturations are taken into account within the fuzzy model. The concept of positive invariance is used to obtain sufficient conditions of asymptotic stability for the global fuzzy system with constrained control inside a subset of the state space. The authors also consider the non-negativity of the states.

Features

► Broadens the reader’s understanding of a widely-used type of fuzzy control
► Explains control design for positive, saturating and 2-dimensional systems
► Treats practical effects of relevance to many chemical, physical and biological processes

Contents


Fields of interest

Control; Artificial Intelligence (incl. Robotics); Computational Intelligence

Target groups

Research

Product category

Monograph

R. M. Bodade, Military College of Telecom Engg, Mhow, India; S. Talbar, Shri GG S Inst of Engg & Technology, Nanded, India

Iris Analysis for Biometric Recognition Systems

The book presents three most significant areas in Biometrics and Pattern Recognition. A step-by-step approach for design and implementation of Dual Tree Complex Wavelet Transform (DTCWT) plus Rotated Complex Wavelet Filters (RCWF) is discussed in detail. In addition to the above, the book provides detailed analysis of iris images and two methods of iris segmentation. It also discusses simplified study of some subspace-based methods and distance measures for iris recognition backed by empirical studies and statistical success verifications.

Features

► Presents conceptual explanation with appropriate suitable figures and supported by empirical studies and statistical success verifications
► Discusses step-by-step approach for design and implementation of Dual Tree Complex Wavelet Transform (DTCWT) plus Rotated Complex Wavelet Filters (RCWF)
► Mentions novel approach of iris segmentation which also leads to aliveness detection method

Contents

Introduction to Iris Recognition.- Related Work.- Iris Segmentation.- Iris Recognition using Dual Tree Complex Wavelet Transform and Rotated Complex Wavelet Filters.- Conclusion and Future Scope.

Fields of interest

Signal, Image and Speech Processing; Biometrics; Computational Intelligence

Target groups

Research

Product category

Brief

M. Bolatkle, L. J. Breems, NXP Semiconductors, Eindhoven, The Netherlands; K. A. Makinwa, Delft University of Technology, Delft, The Netherlands

High Speed and Wide Bandwidth Delta-Sigma ADCs

This book describes techniques for realizing wide bandwidth (125MHz) over-sampled analog-to-digital converters (ADCs) in nano meter-CMOS processes.

Features

► Provides overview of trends in Wide Bandwidth and High Dynamic Range analog-to-digital converters (ADCs)
► Enables the design of a wide bandwidth, high dynamic range modulator with state-of-the-art power efficiency
► Includes introduction to Continuous-Time Delta-Sigma Modulators and its system level modeling
► Explains issues relating to stability of Continuous-Time Delta-Sigma Modulators
► System level design of CT ΔΣ modulators at GHz sampling frequencies
► Practical implementation details of high speed CT ΔΣ ADCs
► Overview of static and dynamic error correction techniques in ΔΣ ADCs
► Dynamic error correction techniques that are suitable for high speed CT ΔΣ ADCs

Contents

Introduction.- Continuous-Time Delta-Sigma Modulator.- Continuous-Time Delta-Sigma Modulators at High Sampling Rates.- A 4GHz Continuous-Time ΔΣ ADC.- A 2GHz Continuous-Time ΔΣ ADC with Dynamic Error Correction.- Conclusions.- Appendices.

Fields of interest

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

Target groups

Research

Product category

Monograph
**High Temperature Gas Dynamics**

**An Introduction for Physicists and Engineers**

High Temperature Gas Dynamics is a primer for scientists, engineers, and students who would like to have a basic understanding of the physics and the behavior of high-temperature gases. It is a valuable tool for astrophysicists as well. The first chapters treat the basic principles of quantum and statistical mechanics and how to derive thermophysical properties from them. Special topics are included that are rarely found in other textbooks, such as the thermophysical and transport properties of multi-temperature gases and a novel method to compute radiative transfer. Furthermore, collision processes between different particles are discussed.

**Features**
- Addresses the physical principles of high-temperature gas dynamics in a manner relevant to engineers
- Emphasizes radiative gas dynamics
- Includes end-of-chapter exercises

**Contents**

**Fields of interest**
Engineering Thermodynamics, Heat and Mass Transfer; Fluid- and Aerodynamics; Physical Chemistry

**Target groups**
Research

**Product category**
Monograph
Distinguished Figures in Mechanism and Machine Science

Their Contributions and Legacies, Part 3

This book is composed of chapters that focus specifically on technological developments by distinguished figures in the history of MMS (Mechanism and Machine Science).

Features

- Contains biographies of distinguished figures in the history of mechanism and machine science (MMS)
- Places past achievements in MMS in context
- Provides a survey of technical evolution in mechanical engineering

Contents


Fields of interest

Mechanical Engineering; History of Science; Humanities, general

Target groups

Research

Product category

Monograph

Y.-W. Chen, Ritsumeikan University College of Science & Engineering, Kusatsu, Shiga, Japan; L. C. Jain, University of South Australia, Adelaide, SA, Australia (Eds)

Subspace Methods for Pattern Recognition in Intelligent Environment

This research book provides a comprehensive overview of the state-of-the-art subspace learning methods for pattern recognition in intelligent environment. With the fast development of internet and computer technologies, the amount of available data is rapidly increasing in our daily life. How to extract core information or useful features is an important issue. Subspace methods are widely used for dimension reduction and feature extraction in pattern recognition.

Feature

- Latest research on the theoretical foundations and applications of subspace methods for pattern recognition using intelligent techniques

Contents


Fields of interest

Appl.Mathematics/Computational Methods of Engineering; Artificial Intelligence (incl. Robotics); Pattern Recognition

Target groups

Research

Product category

Monograph

A. Colombo, Schneider Electric, Ratingen, Germany; T. Bangemann, Institut für Automation und Kommunikation, Magdeburg, Germany; S. Kamouskos, SAP AG, Karlsruhe, Germany; J. Delsing, Luleå University of Technology, Lulea, Sweden; P. Stluka, Honeywell ACS Labs, Prague, Czech Republic; R. Harrison, University of Warwick, Coventry, UK; F. Jammes, Schneider Electric, Grenoble, France; J. L. Lastra, Tampere University of Technology, Tampere, Finland (Eds)

Industrial Cloud-Based Cyber-Physical Systems

The IMC-AESOP Approach

This book presents cutting-edge emerging technologies and approaches in the areas of service-oriented architectures, intelligent devices and cloud-based cyber-physical systems. It provides a clear view on their applicability to the management and automation of manufacturing and process industries. It offers a holistic view of future industrial cyber-physical systems and their industrial usage and also depicts technologies and architectures as well as a migration approach and engineering tools based on these.

Features

- Presents cutting edge technologies in the areas of service-oriented architectures, intelligent devices and cloud-based systems
- Offers a holistic view of future industrial cyber-physical systems and their industrial usage
- Provides a careful balance between the theory and practical aspects of this research

Contents


Fields of interest

Industrial and Production Engineering; Computer Applications; Robotics and Automation

Target groups

Professional/practitioner

Product category

Professional book
**Rethinking Engineering Education**

**The CDIO Approach**

This book describes an approach to engineering education that integrates a comprehensive set of personal, interpersonal, and professional engineering skills with engineering disciplinary knowledge in order to prepare innovative and entrepreneurial engineers.

**Features**
- Provides an overview of the CDIO approach, then chapters organized according to the CDIO Standards
- Includes in each chapter objectives, discussion questions, case studies and clear diagrams to support key concepts and processes
- Avoids the jargon of education specialists and clearly explains education terms in the context of their initial presentation

**Contents**

**Fields of interest**
Job Careers in Science and Engineering; Engineering Design; Control

**Target groups**
Professional/practitioner

**Product category**
Professional book

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**Data-driven Design of Fault Diagnosis and Fault-tolerant Control Systems**

Data-driven Design of Fault Diagnosis and Fault-tolerant Control Systems presents basic statistical process monitoring, fault diagnosis, and control methods, and introduces advanced data-driven schemes for the design of fault diagnosis and fault-tolerant control systems catering to the needs of dynamic industrial processes. With ever increasing demands for reliability, availability and safety in technical processes and assets, process monitoring and fault-tolerance have become important issues surrounding the design of automatic control systems.

**Features**
- Gives the reader a framework of data-driven process monitoring and control techniques, helping them becoming familiar with the basic ideas and schemes in this area in a systematic way
- Provides the reader with much-needed mathematical and control theoretical knowledge and tools for a self-contained study
- Provides the reader with design algorithms and demonstrations on industrial case processes for an easy test and implementation

**Contents**
Introduction.- Objectives, tasks, and basic concepts.- An introduction to the representative technical processes.- Data-driven realization of the basic GLR scheme.- Principal component analysis, technical processes.- Data-driven realization of the basic GLR scheme.- Partial least squares, its variations and applications.- Partial least squares, its variations and applications.- Partial least squares, its variations and applications.- Partial least squares, its variations and applications.- Partial least squares, its variations and applications.- Partial least squares, its variations and applications.

**Fields of interest**
Engineering Design; Control

**Target groups**
Research

**Product category**
Monograph

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**Fuzziness, Democracy, Control and Collective Decision-choice System: A Theory on Political Economy of Rent-Seeking and Profit-Harvesting**

This volume presents an analysis of the problems and solutions of the market mockery of the democratic collective decision-choice system with imperfect information structure composed of defective and deceptive structures using methods of fuzzy rationality.

**Features**
- Presents the Theory of Political Economy of Rent-Seeking and Profit-Harvesting
- Presents problems and solutions of the market mockery of the democratic collective decision-choice system
- Includes a toolbox of methods of fuzzy decision, approximate reasoning, negotiation games and fuzzy mathematics

**Contents**

**Fields of interest**
Computational Intelligence; Economic Policy; Political Economy

**Target groups**
Research

**Product category**
Monograph
K. K. Dompere, Howard University, Washington, DC, USA

Social Goal-Objective Formation, Democracy and National Interest

A Theory of Political Economy Under Fuzzy Rationality

This book presents the development of a theory of social goal-objective formation and its relationship to national interest and social vision under a democratic decision-choice system with imperfect information structure.

Features

► Presents a Theory of Political Economy under Fuzzy Rationality  ► Demonstrates how to use fuzzy logic and its mathematics in the study of economics, social sciences and other complex systems  ► Develops a theory of social goal-objective formation and its relationship to national interest and social vision under a democratic decision-choice system with imperfect information structure

Contents


Fields of interest

Computational Intelligence; Economic Policy; Political Economy

Target groups

Research

Product category

Monograph

C.-H. Du, P.-K. Liu, Peking University, Beijing, China

Millimeter-Wave Gyrotron Traveling-Wave Tube Amplifiers

A gyrotron traveling-wave amplifier (gyro-TWT) with the high-power and broad-band capabilities is considered as a turn-on key for next generation high-resolution radar. The book presents the most advanced theory, methods and physics in a gyro-TWT. The most challenging problem of instability competition has been for the first time addressed in a focused and systematic way and reported via concise states and vivid pictures. The book is likely to meet the interest of researchers and engineers in radar and microwave technology, who would like to study the gyro-TWTs and to promote its application in millimeter-wave radars.

Features

► The first book to systematically introduce gyro-TWT theory, method and physics  ► Presents theories concisely and in a manner that is easy to follow for newcomers  ► Includes plenty of vivid figures to illuminate complicated physics  ► Developed a gyro-TWT systematically considering both the theory and engineering applications

Contents


Fields of interest

Microwaves, RF and Optical Engineering; Electronics and Microelectronics, Instrumentation; Optics, Optoelectronics, Plasmonics and Optical Devices

Target groups

Research

Product category

Monograph

M. Erbe, Universität zu Lübeck, Lübeck, Germany

Field Free Line Magnetic Particle Imaging

Marlitt Erbe provides a detailed introduction into the young research field of Magnetic Particle Imaging (MPI) and field free line (FFL) imaging in particular. She derives a mathematical description of magnetic field generation for FFL imaging in MPI. To substantiate the simulation studies on magnetic FFL generation with a proof-of-concept, the author introduces the FFL field demonstrator, which provides the world’s first experimentally generated rotated and translated magnetic FFL field complying with the requirements for FFL reconstruction. Furthermore, she proposes a scanner design of considerably enhanced magnetic field quality and efficiency. The author discusses the influence of magnetic field quality optimization on the image quality achieved using efficient Radon-based reconstruction methods, which arise for a line detection scheme and based on this optimized design, presents a dynamic FFL scanner assembly.

Feature

► Publication in the field of technical sciences

Contents


Fields of interest

Biomedical Engineering; Simulation and Modeling; Medical and Radiation Physics

Target groups

Research

Product category

Monograph

Due April 2014

2014. XII, 290 p. (Studies in Systems, Decision and Control, Volume 4) Hardcover

► * € (D) 139,09  | € (A) 142,99  | sFr 173,50
► € 129,99  | £117.00

ISBN 978-3-319-05172-7

Due June 2014

2014. 350 p. 320 illus., 120 in color. Hardcover

► approx.  * € (D) 139,09  | € (A) 142,99  | sFr 173,50
► approx.  € 129,99  | £117.00

ISBN 978-3-642-54727-0

Due March 2014

2014. XXVII, 154 p. 67 illus. (Aktuelle Forschung Medizintechnik) Softcover

► * € (D) 69,99  | € (A) 71,95  | sFr 87,50
► € 65,41  | £58.99

ISBN 978-3-658-05336-9

Due March 2014
The Automotive Transmission Book
With contrib. by: T. Kassel, Braunschweig, Germany; G. Kokalj, B. Wultsch, AVL List GmbH, Graz, Austria; A. Plötner, Technical University Braunschweig, Germany; C. Hörsken, GETRAG FORD Transmissions GmbH, Cologne, Germany

This book presents essential information on systems and interactions in automotive transmission technology and outlines the methodologies used to analyze and develop transmission concepts and designs.

Features
▶ Provides a universal expertise for both state-of-the-art and future transmission technologies
▶ Presents knowledge about systems and interactions in automotive transmission technology
▶ Includes systems for electric and hybrid electric vehicles

Contents
Core tasks of vehicle transmissions. - Shift dynamics and shift comfort. - Power transfer elements. - Actuation, servo and auxiliary systems. - Transmission designs for passenger cars. - Power train electrification. - Transmission applications outside of the passenger vehicle sector.

Fields of interest
Automotive Engineering; Transportation

Target groups
Research

Product category
Monograph

H. Gao, X. Li, Harbin Institute of Technology, Harbin, China

Robust Filtering for Uncertain Systems
A Parameter-Dependent Approach

This monograph provides the reader with a systematic treatment of robust filter design, a key issue in systems, control and signal processing, because of the fact that the inevitable presence of uncertainty in system and signal models often degrades the filtering performance and may even cause instability.

Features
▶ Catches all it’s control design approaches in terms of popular and easy-to-implement linear matrix inequality problems
▶ Filter designs presented in increasing complexity allow readers full flexibility in their choice of appropriate method
▶ Numerous simulation examples give readers clear and easy-to-follow demonstrations of the filter designs developed
▶ Makes problem specification more accurate and improves filter performance by enumerating and dealing with realistic causes of system uncertainty

Contents

Fields of interest
Control; Systems Theory, Control; Signal, Image and Speech Processing

Target groups
Research

Product category
Monograph

O. Granichin, Saint Petersburg State University, St. Petersburg, Russia; Z. (. Volkovich, D. Toledano-Kitai, ORT Braude College, Karmiel, Israel

Randomized Algorithms in Automatic Control and Data Mining

In the fields of data mining and control, the huge amount of unstructured data and the presence of uncertainty in system descriptions have always been critical issues. The book Randomized Algorithms in Automatic Control and Data Mining introduces the readers to the fundamentals of randomized algorithm applications in data mining (especially clustering) and in automatic control synthesis. The methods proposed in this book guarantee that the computational complexity of classical algorithms and the conservativeness of standard robust control techniques will be reduced. It is shown that when a problem requires “brute force” in selecting among options, algorithms based on random selection of alternatives offer good results with certain probability for a restricted time and significantly reduce the volume of operations.

Features
▶ Latest research on Randomized Algorithms in Automatic Control and Data Mining
▶ Provides basic knowledge in Data Mining, Control Theory, Pattern Recognition and Randomized Algorithms
▶ Written by leading experts in the field

Contents
Randomized algorithms. - Randomization in estimation, identification and filtering problems under arbitrary external noises. - Data mining.

Fields of interest
Computational Intelligence; Control; Data Mining and Knowledge Discovery

Target groups
Research

Product category
Monograph

Due May 2014
2014. XV, 251 p. 45 illus., 18 in color. (Communications and Control Engineering) Hardcover
▶ € (D) 90,94 | € (A) 93,49 | sFr 113,50
▶ € 84,99 | £76.50
ISBN 978-3-319-05902-0

Due April 2014
▶ € (D) 106,99 | € (A) 109,99 | sFr 133,50
▶ € 99,99 | £90.00
ISBN 978-3-642-54785-0
Brain-Computer Interface Research

A State-of-the-Art Summary –2

This book reports on the latest research and developments in the field of brain-computer interfaces (BCIs).

Features
► Presents innovative research in the field of brain-computer interface
► Offers a detailed description of the projects nominated for the BCI Research Award 2012
► Includes additional background material and new developments of the projects since their submission to the award
► Identifies dominant and emerging directions of brain-computer interface research

Contents

Fields of interest
Biomedical Engineering; Signal, Image and Speech Processing; Control

Target groups
Research

Product category
Monograph

Fuzzy Portfolio Optimization

Advances in Hybrid Multi-criteria Methodologies

This monograph presents a comprehensive study of portfolio optimization, an important area of quantitative finance. Considering that the information available in financial markets is incomplete and that the markets are affected by vagueness and ambiguity, the monograph deals with fuzzy portfolio optimization models.

Features
► Offers a comprehensive report on the state-of-the-art in fuzzy portfolio optimization
► Makes the reader familiar with advanced optimization techniques for multi-criteria portfolio optimization models
► Written by leading experts in the field

Contents

Fields of interest
Computational Intelligence; Optimization; Economics general

Target groups
Research

Product category
Monograph

Due April 2014
2014. XII, 119 p. (Biosystems & Biorobotics, Volume 6) Hardcover
► € (D) 106,99 | £ (A) 109,99 | sFr 133,50
► € 99,99 | £90.00
ISBN 978-3-642-54706-7

Due April 2014
2014. XII, 304 p. (Studies in Fuzziness and Soft Computing, Volume 316) Hardcover
► € (D) 139,09 | £ (A) 142,99 | sFr 173,50
► € 129,99 | £117.00
ISBN 978-3-642-54651-7

Due June 2014
2014. 380 p. 100 illus., 40 in color. Hardcover
► € (D) 139,09 | £ (A) 142,99 | sFr 173,50
► € 129,99 | £117.00
ISBN 978-3-319-05448-3

Steering Handbook

This edited volume presents basic principles as well as advanced concepts of the computational modeling of steering systems. Moreover, the book includes the components and functionalities of modern steering system, which are presented comprehensively and in a practical way. The book is written by more than 15 leading experts from the automotive industry and its components suppliers. The target audience primarily comprises practicing engineers, developers, researchers as well as graduate students who want to specialize in this field.

Features
► Covers the fundamentals of modern steering systems as well as advanced concepts
► Written by more than 15 leading researchers and practitioners working in the automotive industry and its components suppliers
► Addresses developers, practitioners as well as researchers and graduate students

Contents

Fields of interest
Automotive Engineering; Vibration, Dynamical Systems, Control; Mathematical Modeling and Industrial Mathematics

Target groups
Professional/practitioner

Product category
Monograph
H. F. Hoffman, Fairfield University, Fairfield, CT, USA

The Engineering Capstone Course

Fundamentals for Students and Instructors

This essential book takes students and instructors through steps undertaken in a start-to-finish engineering project as conceived and presented in the engineering capstone course.

Features

- Identifies the most important competencies and deliverables engineering/project executives expect before embarking on a project effort
- Challenges students to defend the use of resources and demonstrate the likely return on investment (ROI)
- Focuses on the practicalities of project completion in the environment in which the majority of students will work
- Provides specific outlines for weekly presentations, the proposal report, and the final report
- Simplifies instructors’ class planning with ideas for how to organize, structure, and manage an engineering capstone course
- Describes the likely phases that a team might go through using the well-known Tuckman model
- Enlightens engineering instructors who teach a capstone or senior project course but have not worked in industry

Contents

Engineering and the Capstone Course.- The Capstone Team.- Basic Team Communications.- Capstone Class Written and Oral Submittals.- Project Development.- Intellectual Property.- Epilogue.- Appendix.

Fields of interest

Engineering Design; Job Careers in Science and Engineering; Innovation/Technology Management

Target groups

Upper undergraduate

Product category

Graduate/Advanced undergraduate textbook

Due June 2014

2014. XIV, 200 p. 30 illus. Hardcover

- € (D) 64,19 | £ (A) 65,99 | sFr 79,00
- € 59,99 | £53,99

ISBN 978-3-319-05896-2

H. A. Jakobsen, Norwegian University of Science and Technology, Trondheim, Norway

Chemical Reactor Modeling

Multiphase Reactive Flows

Chemical Reactor Modeling closes the gap between Chemical Reaction Engineering and Fluid Mechanics. The second edition consists of two volumes: Volume 1: Fundamentals. Volume 2: Chemical Engineering Applications In volume 1 most of the fundamental theory is presented. A few numerical model simulation application examples are given to elucidate the link between theory and applications. In volume 2 the chemical reactor equipment to be modeled are described. Several engineering models are introduced and discussed. A survey of the frequently used numerical methods, algorithms and schemes is provided. A few practical engineering applications of the modeling tools are presented and discussed.

Features

- Missing link between Chemical Engineering and Fluid Mechanics textbooks
- In depth derivation and explanation of the equations for multiphase reactive flows
- Presents the computational methods for solving these equations
- Written by a chemical engineer for engineers using well known vocabulary and notation
- Detailed references to the literature

Contents


Fields of interest

Engineering Fluid Dynamics; Industrial Chemistry/Chemical Engineering; Industrial and Production Engineering

Target groups

Research

Product category

Monograph

Due April 2014

2nd ed. 2014. LXIV, 1728 p. 175 illus., 34 in color. Hardcover

- € (D) 245,03 | £ (A) 251,90 | sFr 305,00
- £ 229,00 | £206.50

ISBN 978-3-319-05091-7

C. F. Jensen, Aalborg University, Aalborg, Denmark

Online Location of Faults on AC Cables in Underground Transmission Systems

This book reports on various techniques for fault location on cross bonded cables, identifies the best method and describes the construction of a full fault locator system. The developed system is able of pinpointing the fault location on long cross-bonded cable systems and will be installed in Danish substations for monitoring the coming cable-based transmission grid. The work was conducted as part of a collaborative project between the department of energy technology at Aalborg University and the Danish transmission system operator for electricity and natural gas, Energinet.dk.

Features

- Nominated as outstanding PhD thesis by Aalborg University, Denmark
- Provides a detailed study on fault location in underground cable systems
- Reports on the development of a fault locator system capable of locating faults on both crossbonded cables and on hybrid lines

Contents

Preliminaries.- Fault Location on Crossbonded Cables using Impedance-based Methods.- Fault Location on Crossbonded.- Cables using Traveling Waves.- Conclusions.

Fields of interest

Power Electronics, Electrical Machines and Networks; Energy Systems; Energy Technology

Target groups

Research

Product category

Monograph

Due April 2014

2014. XXI, 219 p. 145 illus., 76 in color. (Springer Theses) Hardcover

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

ISBN 978-3-319-05397-4
S. Kajita, H. Hirukawa, K. Harada, K. Yokoi, National Institute of Advanced Industrial Science & Technology (AIST), Tsukuba-shi, Ibaraki, Japan

**Introduction to Humanoid Robotics**

This book is for researchers, engineers, and students who are willing to understand how humanoid robots move and be controlled. The book starts with an overview of the humanoid robotics research history and state of the art. Then it explains the required mathematics and physics such as kinematics of multi-body system, Zero-Moment Point (ZMP) and its relationship with body motion. Biped walking control is discussed in depth, since it is one of the main interests of humanoid robotics. Various topics of the whole body motion generation are also discussed. Finally multi-body dynamics is presented to simulate the complete dynamic behavior of a humanoid robot. Throughout the book, Matlab codes are shown to test the algorithms and to help the reader’s understanding.

**Features**

- Concise and understandable book about variational principles of continuum mechanics
- Accessible to applied mathematicians, physicists and engineers who have an interest in continuum mechanics
- Interesting innovative textbook for graduate students

**Contents**

Kinematics.- Zero-Moment-Point and Dynamics.- Biped walking.- Generation of Whole Body Motion Patterns.- Dynamic simulation.

**Fields of interest**

Control, Robotics, Mechatronics; Artificial Intelligence (incl. Robotics); Machinery and Machine Elements

**Target groups**

Research

**Product category**

Monograph

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A. Kaveh, Iran University of Science and Technology, Tehran, Iran

**Advances in Metaheuristic Algorithms for Optimal Design of Structures**

This book presents efficient metaheuristic algorithms for optimal design of structures. Many of these algorithms are developed by the author and his colleagues, consisting of Democratic Particle Swarm Optimization, Charged System Search, Magnetic Charged System Search, Field of Forces Optimization, Dolphin Echolocation Optimization, Colliding Bodies Optimization, Ray Optimization. These are presented together with algorithms which were developed by other authors and have been successfully applied to various optimization problems.

**Features**

- The most well-known and efficient metaheuristic algorithms are presented
- Applications in structural engineering are demonstrated
- Different algorithms which are applied successfully by the author’s team will be compared

**Contents**


**Fields of interest**

Appl.Mathematics/Computational Methods of Engineering; Optimization; Mechanical Engineering

**Target groups**

Research

**Product category**

Monograph

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G. Kerschen, University of Liege, Liege, Belgium (Ed)

**Modal Analysis of Nonlinear Mechanical Systems**

The book first introduces the concept of nonlinear normal modes (NNMs) and their two main definitions. The fundamental differences between classical linear normal modes (LNMs) and NNMs are explained and illustrated using simple examples. Different methods for computing NNMs from a mathematical model are presented. Both advanced analytical and numerical methods are described. Particular attention is devoted to the invariant manifold and normal form theories. The book also discusses nonlinear system identification.

**Features**

- Exposition to advanced analytical, computational and experimental methods
- Important applications of the nonlinear normal mode theory, including model reduction and vibration and acoustic mitigation
- Nonlinear system identification will be discussed

**Contents**


**Fields of interest**

Vibration, Dynamical Systems, Control; Nonlinear Dynamics; Dynamical Systems and Ergodic Theory

**Target groups**

Research

**Product category**

Monograph

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Due April 2014

Original Japanese edition published by Ohmsha Ltd., Tokyo 2005


- € (D) 90.94 | € (A) 93.49 | sFr 113.50
- € 84.99 | £76.50
ISBN 978-3-642-54535-7

Due May 2014

2014. XVI, 404 p. 197 illus., 97 in color. Hardcover

- € (D) 106.99 | € (A) 109.99 | sFr 133.50
- € 99.99 | £90.00
ISBN 978-3-319-05548-7

Due August 2014

2015. VIII, 340 p. 164 illus. (CISM International Centre for Mechanical Sciences, Volume 555) Hardcover

- € (D) 159.43 | € (A) 163.90 | sFr 198.50
- € 149.00 | £134.50
ISBN 978-3-7091-1790-3
Robot Intelligence Technology and Applications 2

Results from the 2nd International Conference on Robot Intelligence Technology and Applications

We are facing a new technological challenge on how to store and retrieve knowledge and manipulate intelligence for autonomous services by intelligent systems which should be capable of carrying out real world tasks autonomously. To address this issue, robot researchers have been developing intelligence technology (IntT) for "robots that think" which is in the focus of this book. The book covers all aspects of intelligence from perception at sensor level and reasoning at cognitive level to behavior planning at execution level for each low level segment of the machine.

Features
- Recent Research on Robot Intelligence Technology and Applications
- Proceedings of the Second International Conference on Robot Intelligence Technology and Applications (RITA 2013) held in Denver on December 18 - 20, 2013

Contents
Ambient, Collective, Cognitive and Social Intelligence.- Behavioral, Collective and Genetic Intelligence.- Emerging Applications of Robot Intelligence Technology:

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

Target groups
Research

Product category
Monograph

Due April 2014

An Introduction to Modelling of Power System Components

S. Krishna, Indian Institute of Technology Madras, Chennai, India

The brief provides a quick introduction to the dynamic modelling of power system components. It gives a rigorous derivation of the model of different components of the power system such as synchronous generator, transformer, transmission line, FACTS, DC transmission system, excitation system and speed governor. Models of load and prime movers are also discussed. The brief can be used as a reference for researchers working in the areas of power system dynamics, stability analysis and design of stability controllers. It can also serve as a text for a short course on power system modelling, or as a supplement for a senior undergraduate/graduate course on power system stability.

Features
- Concise yet includes all the important power system components which are essential for dynamic analysis
- Gives a rigorous derivation of the model of system components starting from first principles
- Includes the latest developments such as voltage source converter based FACTS and DC transmission systems

Contents

Fields of interest
Power Electronics, Electrical Machines and Networks; Circuits and Systems; Applied Mathematics/Computational Methods of Engineering

Target groups
Research

Product category
Brief

Due April 2014

Energy Methods in Dynamics

K. C. Le, L. T. Nguyen, Ruhr Universität Bochum, Bochum, Germany

Energy Methods in Dynamics is a textbook based on the lectures given by the first author at Ruhr University Bochum, Germany. Its aim 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
- The extended and reworked second edition of this successful book includes solutions to all exercises showing the energy and variational asymptotic method in “action”
- The present second edition also includes a new chapter on the new developments in slope and amplitude modulation of nonlinear waves

Contents
Part I Linear theory.- Part II Nonlinear theory.

Fields of interest
Vibration, Dynamical Systems, Control; Systems Theory, Control; Energy, general

Target groups
Research

Product category
Monograph

Due March 2014

Engineering
Algebraic Circuits

This book presents a complete and accurate study of algebraic circuits, digital circuits whose performance can be associated with any algebraic structure. The authors distinguish between basic algebraic circuits, such as Linear Feedback Shift Registers (LFSRs) and cellular automata and algebraic circuits, such as finite fields or Galois fields. The book includes a comprehensive review of representation systems, of arithmetic circuits implementing basic and more complex operations and of the residue number systems (RNS). It presents a study of basic algebraic circuits such as LFSRs and cellular automata as well as a study of circuits related to Galois fields, including two real cryptographic applications of Galois fields.

Features

► First self-contained reference guide to algebraic circuits ► Provides the readers with the necessary theoretical background for an easy understanding of algebraic circuits and for their use in practice ► Written by leading experts in the field

Contents

Number Systems.- Basic Arithmetic Circuits.- Residue Number Systems.- Basic algebraic circuits.- Galois Fields GF(2m).- Galois Fields GF(pn).- Two Galois fields cryptographic applications.

Fields of interest

Circuits and Systems; General Algebraic Systems;
Data Structures, Cryptology and Information Theory

Target groups

Research

Product category

Monograph

E. Lockard, Chaminade University, Honolulu, HI, USA

Human Migration to Space

Alternative Technological Approaches for Long-Term Adaptation to Extraterrestrial Environments

Human migration to space will be the most profound catalyst for evolution in the history of humankind, yet this has had little impact on determining our strategies for this next phase of exploration. Habitation in space will require extensive technological interfaces between humans and their alien surroundings and how they are deployed will critically inform the processes of adaptation.

Features

► Nominated by University of Hawaii Manoa as an outstanding Ph.D. thesis ► Considers evolutionary aspects of human migration to space and the need for new technological interfaces with the alien environment ► Explores how technological design and the interior architecture of the habitat can facilitate human adaptation to other planets

Contents


Fields of interest

Aerospace Technology and Astronautics; Interdisciplinary Studies; Interior Architecture and Design

Target groups

Research

Product category

Monograph

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

Applied Computing and Information Technology

Features

► Recent research in Applied Computers and Information Technology ► Edited outcome of the ACIS SCIT 2013, held August 31- Sept 4, 2013 in Matsue City, Japan ► Written by experts in the field

Contents


Fields of interest

Computational Intelligence; Artificial Intelligence (incl. Robotics)

Target groups

Research

Product category

Monograph

Due May 2014

2014. 260 p. (Studies in Computational Intelligence, Volume 553) Hardcover

► € (D) 106,99 | € (A) 109,99 | sFr 133,50
► € 99,99 | £90.00
ISBN 978-3-319-05929-7

Due April 2014


► € (D) 139,09 | € (A) 142,99 | sFr 173,50
► € 129,99 | £117,00
ISBN 978-3-642-54648-7

Due May 2014

2014. 200 p. (Studies in Computational Intelligence, Volume 553) Hardcover

► € (D) 106,99 | € (A) 109,99 | sFr 133,50
► € 99,99 | £90.00
ISBN 978-3-319-05716-7
Virtual, Augmented Reality and Serious Games for Healthcare 1

There is a tremendous interest among researchers for the development of virtual, augmented reality and games technologies due to their widespread applications in medicine and healthcare. To date the major applications of these technologies include medical simulation, telemedicine, medical and healthcare training, pain control, visualization aid for surgery, rehabilitation in cases such as stroke, phobia and trauma therapies. Many recent studies have identified the benefits of using Virtual Reality, Augmented Reality or serious games in a variety of medical applications.

Features
- Latest research on Virtual Reality and Augmented Reality in Healthcare
- Offers an insightful introduction to the development and applications of virtual and augmented reality technologies in medical and clinical settings

Written by leading experts in the field

Contents
Applications in Healthcare Education.- Nursing Training, Health Literacy, and Healthy Behaviour.- Applications in Neuropsychology.- Applications in Motor Rehabilitation.- Therapeutic Games aimed at Various Diseases.- Virtual Healing and Restoration.

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

Target groups
Research

Product category
Monograph

Introduction to Autonomous Manipulation
Case Study with an Underwater Robot, SAUVIM

“Autonomous manipulation” is a challenge in robotic technologies. It refers to the capability of a mobile robot system with one or more manipulators that performs intervention tasks requiring physical contacts in unstructured environments and without continuous human supervision. Achieving autonomous manipulation capability is a quantum leap in robotic technologies as it is currently beyond the state of the art in robotics. This book addresses issues with the complexity of the problems encountered in autonomous manipulation including representation and modeling of robotic structures, kinematic and dynamic robotic control, kinematic and algorithmic singularity avoidance, dynamic task priority, workspace optimization and environment perception. Further development in autonomous manipulation should be able to provide robust improvements of the solutions for all of the above issues.

Features
- Latest research on Virtual Reality and Augmented Reality
- Offers an in-depth treatise of attitude kinematics and dynamics
- Contains detailed derivations and implementations of attitude determination algorithms
- Includes real-world examples from actual working spacecraft missions

Contents

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

Target groups
Research

Product category
Monograph
Data-driven Modeling for Diabetes

Diagnosis and Treatment

This contributed volume presents computational models of diabetes that quantify the dynamic interrelationships among key physiological variables implicated in the underlying physiology under a variety of metabolic and behavioral conditions.

Features

► Presents a unique collection of model-based studies related to diabetes ► Provides model-based strategies for early and sensitive diagnosis of diabetes ► Includes practical model-based methods for online glycemic control ► Written by leading experts in the field

Contents


Fields of interest

Biomedical Engineering; Diabetes; Human Physiology

Target groups

Research

Product category

Monograph

Due April 2014

2014. V, 270 p. 74 illus., 40 in color. (Lecture Notes in Bioengineering) Hardcover
► ¤ (D) 106,99 | (A) 109,99 | sFr 133,50
► € 99,99 | £90.00
ISBN 978-3-642-54463-7
Nanofluids
Thermodynamic and Transport Properties

This volume offers a comprehensive examination of the subject of heat and mass transfer with nanofluids as well as a critical review of the past and recent research projects in this area. Emphasis is placed on the fundamentals of the transport processes using particle-fluid suspensions, such as nanofluids. The nanofluid research is examined and presented in a holistic way using a great deal of our experience with the subjects of continuum mechanics, statistical thermodynamics, and non-equilibrium thermodynamics of transport processes.

Features
► Provides a deep scientific analysis of nanofluids using classical thermodynamics and statistical thermodynamics to explain and interpret recent experimental observations ► Presents both thermodynamic and transport properties ► Examines all transport properties as well as their relationships ► Combines recent knowledge pertaining to nanofluids with the previous fifty years research on particulate flows ► Conducts an holistic examination of material from more than 300 archival publications

Contents

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

Target groups
Research

Product category
Monograph

Due May 2014
2014. XX, 300 p. 66 illus. Hardcover
► € (D) 139,09 | € (A) 142,99 | sFr 173,50
► € 129,99 | £117.00
ISBN 978-3-319-05620-7

Serviceology for Services
Selected papers of the 1st International Conference on Serviceology

Services are key activities in the globalization of the economy and also underlie the quality of life of local residents. The advanced work presented in this book was selected from the proceedings of the First International Conference on Serviceology (ICServ2013), held October 16–18, 2013 in Tokyo.

Features
► Advanced works presented in this book that were selected from the proceedings of the 1st international conference on Serviceology (ICServ2013), held in October 16–18, 2013 in Tokyo ► Developed theories of service and maintenance based on general design theory ► Provide deep industry knowledge of future trends, and operations technology

Contents

Fields of interest
Engineering Economics, Organization, Logistics, Marketing, Production/Logistics/Supply Chain Management; Engineering Design

Target groups
Research

Product category
Monograph

Due May 2014
2014. VI, 262 p. 286 illus., 217 in color. Hardcover
► € (D) 139,09 | € (A) 142,99 | sFr 173,50
► € 129,99 | £117.00
ISBN 978-4-431-54815-7

Computational Intelligence in Digital Forensics

Computational Intelligence techniques have been widely explored in various domains including forensics. Analysis in forensic encompasses the study of pattern analysis that answer the question of interest in security, medical, legal, genetic studies and etc. However, forensic analysis is usually performed through experiments in lab which is expensive both in cost and time. Therefore, this book seeks to explore the progress and advancement of computational intelligence technique in different focus areas of forensic studies. This aims to build stronger connection between computer scientists and forensic field experts. This book, Computational Intelligence in Digital Forensics: Forensic Investigation and Applications, is the first volume in the Intelligent Systems Reference Library series. The book presents original research results and innovative applications of computational intelligence in digital forensics.

Features
► Recent research on Computational Intelligence in Digital Forensics ► Computational intelligence methods applied to Digital Forensics ► Written by experts in the field

Contents
Introduction. - Forensic Discovery and Investigation. - Intelligent Forensic Science Applications.

Fields of interest
Computational Intelligence; Systems and Data Security; Artificial Intelligence (incl. Robotics)

Target groups
Research

Product category
Monograph

Due April 2014
2014. XII, 436 p. (Studies in Computational Intelligence, Volume 555) Hardcover
► € (D) 106,99 | € (A) 109,99 | sFr 133,50
► £ 99.99 | £90.00
ISBN 978-3-319-05884-9
S. Mumtaz, J. Rodriguez, Aveiro, Portugal (Eds)

**Smart Device to Smart Device Communication**

This book presents a comprehensive analysis of D2D communication over LTE-A band. The book uses 3GPP LTE-A as a baseline and explains all fundamental requirements for deploying D2D network under cellular systems from an architectural, technical and business point of view. The contributors explain the standardization activities of Release 12 of LTE-A, which has been recently acknowledged as support of D2D communication in LTE-A.

**Features**
- Discusses ground breaking ideas in the newly emerging of D2D communication over licensed band
- Covers the complete System level simulator for D2D communication for the analysis of proposed protocol and algorithm
- Presents real life applications and use cases

**Contents**
- Introduction.
- LTE-A Access, Core and Protocol architecture for D2D Communication.
- Node/Peer Discovery, Mode Selection and Signaling for D2D Communication in LTE-A band.
- Interference Management in D2D Communication.
- Establishment and Maintenance of D2D Communication.
- Network Assisted Device-to-Device Communications: Use Cases, Design Approaches and Performance Aspects.
- Network-assisted D2D over WiFi Direct.
- Device-to-Device (D2D) Communication in Heterogeneous Networks (HetNets).
- Mobile Cloud Over LTE-A Band.
- Interdependency between Mobile and Electricity Distribution networks: outlook and prospects.

**Fields of interest**
- Communications Engineering, Networks; Input/Output and Data Communications; Electrical Engineering

**Target groups**
- Research

**Product category**
- Professional book

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N. Munier, Valencia, Valencia, Spain

**Risk Management for Engineering Projects**

**Procedures, Methods and Tools**

Covers the entire process of risk management by providing methodologies for determining the sources of engineering project risk, and once threats have been identified, managing them through: identification and assessment (probability, relative importance, variables, risk breakdown structure, etc.); implementation of measures for their prevention, reduction or mitigation; evaluation of impacts and quantification of risks and establishment of control measures. It also considers sensitivity analysis to determine the influence of uncertain parameters values on different project results, such as completion time, total costs, etc.

**Features**
- A complete manual on addressing engineering risk
- Written in a down-to-earth style that demystifies the concepts
- Numerous case studies, applied examples and simulations inform the reader
- Provides step-by-step guidance on assessing and managing risk

**Contents**
- Principles And Elements Of Risk Management
- Data And Initial Conditions
- Planning
- Probabilities In Risk Management
- Risk Identification
- Risk Assessment And Analysis
- Sensitivity Analysis
- Project During Execution
- Strategy
- Updating
- Closing And Reporting
- Brief Introduction To Probability Distributions

**Fields of interest**
- Quality Control, Reliability, Safety and Risk;
- Environmental Engineering/Biotechnology; Project Management

**Target groups**
- Graduate

**Product category**
- Graduate/Advanced undergraduate textbook

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R. Naboni, I. Paoletti, Polytechnic University of Milan, Milano, Italy

**Advanced Customization in Architectural Design and Construction**

This book presents the state of the art in mass customization within the construction sector, explaining the important new technologies that are boosting product and process innovation and identifying the challenges to be confronted as we move toward a mass customization construction industry. Cloud design and software integration are discussed and an overview is provided of the manufacturing techniques offered through digital methods that are acquiring particular significance within the field of digital architecture.

**Features**
- Presents the state of the art and key challenges in mass customization within the construction sector
- Describes cutting-edge case studies in digitally fabricated architectural realizations
- Provides a helpful glossary of terms for newcomers to the topic
- Includes comparative tables with specifications for CNC procedures

**Contents**
- Mass Industrialized customization: system design vs. product choice.
- Cloud Design and Software Integration.
- File-to-Factory processes.
- Additive/Generative Fabrication.
- Subtractive Methods.
- Transformative Method.
- Case Studies.
- Future customization: a new model for design and construction.

**Fields of interest**
- Construction Management; Computer-Aided Engineering (CAD, CAE) and Design; Manufacturing, Machines, Tools

**Target groups**
- Research

**Product category**
- Brief

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Due April 2014

2014. VI, 287 p. 137 illus., 127 in color. Hardcover
- € (D) 96,29 | € (A) 98,99 | sFr 120,00
- € 89,99 | £81.00
ISBN 978-3-319-04962-7

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Due April 2014

2014. X, 198 p. 50 illus., 11 in color. Hardcover
- € (D) 74,89 | € (A) 76,99 | sFr 93,50
- € 69,99 | £62.99
ISBN 978-3-319-05250-7

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Due July 2014

2014. 125 p. 30 illus. (SpringerBriefs in Applied Sciences and Technology / PoliMI SpringerBriefs)
- Softcover
- approx. € (D) 53,49 | € (A) 54,99 | sFr 67,00
- approx. € 49,99 | £44,99
ISBN 978-3-319-04424-4
**Geometric Theory of Information**


**Features**
- Brings together geometric tools and their applications for Information analysis
- Collects the most important contributions to the conference GSI’2013 - Geometric Science of Information
- Presents many current uses of in the interdisciplinary fields of Information Geometry Manifolds

**Contents**
Preface.- Divergence Functions and Geometric Structures They Induce on a Manifold.- Geometry on Positive Definite Matrices Deformed by \( \gamma \)-potentials and Its Submanifold Structure.- Hessian structures and divergence functions on deformed exponential families.- Harmonic maps relative to \( \gamma \)-connections.- A Riemannian geometry in the \( \gamma \)-exponential Banach manifold induced by \( \gamma \)-divergences.- Computational algebraic methods in efficient estimation.

**Fields of interest**
Signal, Image and Speech Processing; Differential Geometry; Data Mining and Knowledge Discovery

**Target groups**
Research

**Product category**
Monograph

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**Microwave Tomography**

**Global Optimization, Parallelization and Performance Evaluation**

This book provides a detailed overview on the use of global optimization and parallel computing in microwave tomography techniques. The book focuses on techniques that are based on global optimization and electromagnetic numerical methods. The authors provide parallelization techniques on homogeneous and heterogeneous computing architectures on high performance and general purpose futuristic computers.

**Features**
- Focuses on microwave tomography imaging which provide quantitative images and requires solve inverse scattering problem using iterative technique
- Introduces techniques that can be efficiently used for real time analysis of medical imaging techniques

**Contents**

**Fields of interest**
Microwaves, RF and Optical Engineering; Computer Imaging, Vision, Pattern Recognition and Graphics; Signal, Image and Speech Processing

**Target groups**
Research

**Product category**
Monograph

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**Nuclear Reactor Design**

This book focuses on core design and methods for design and analysis. It is based on advances made in nuclear power utilization and computational methods over the past 40 years, covering core design of boiling water reactors and pressurized water reactors, as well as fast reactors and high-temperature gas-cooled reactors. The objectives of this book are to help graduate and advanced undergraduate students to understand core design and analysis, and to serve as a background reference for engineers actively working in light water reactors. Methodologies for core design and analysis, together with physical descriptions, are emphasized. The book also covers coupled thermal hydraulic core calculations, plant dynamics, and safety analysis, allowing readers to understand core design in relation to plant control and safety.

**Features**
- Presents theoretical and methodological designs of boiling water reactors and pressurized water reactors as well as fast reactors and high-temperature gas-cooled reactors
- Equips readers to understand fundamental reactor theory and heat transfer
- The descriptions are largely self-contained

**Contents**
Fuel Burnup and Reactivity Control.- Nuclear Reactor Calculations.- Core Design of Light Water Reactors.- Core Design of Advanced Reactors.

**Fields of interest**
Nuclear Engineering; Nuclear Energy; Energy Technology

**Target groups**
Research

**Product category**
Monograph

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Due July 2014

2014. 450 p. (Signals and Communication Technology) Hardcover
- approx. € (D) 139,09 | € (A) 142,99 | sFr 173,50
- approx. € 129,99 | £117.00
ISBN 978-3-319-05316-7

Due October 2014

2015. Approx. 235 p. 122 illus., 99 in color. Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 127,50
- approx. € 99,95 | £86.50
ISBN 978-1-4939-0751-7

Due April 2014

2014. XV, 352 p. 179 illus., 1 in color. (An Advanced Course in Nuclear Engineering, Volume 2) Hardcover
- * (D) 106,99 | € (A) 109,99 | sFr 133,50
- € 99,99 | £90.00
ISBN 978-4-431-54897-3
**The Highway Capacity Manual: A Conceptual and Research History**

**Volume 1: Uninterrupted Flow**

Since 1950, the Highway Capacity Manual has been a standard used in the planning, design, analysis, and operation of virtually any highway traffic facility in the United States. It has also been widely used abroad, and has spurred the development of similar manuals in other countries.

**Features**
- Presents an overview of the research, theory and practice of highway capacity analysis
- The fundamental concepts and research that have produced the methods now applied to the US roads and highways are presented in straightforward language with illustrations
- Focus on Uninterrupted Flow

**Contents**

**Fields of interest**
Engineering Economics, Organization, Logistics, Marketing, Civil Engineering, Complexity

**Target groups**
Research

**Product category**
Monograph

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**Computational Approaches to Analogical Reasoning: Current Trends**

Analogical reasoning is known as a powerful mode for drawing plausible conclusions and solving problems. It has been the topic of a huge number of works by philosophers, anthropologists, linguists, psychologists and computer scientists. As such, it has been early studied in artificial intelligence, with a particular renewal of interest in the last decade. The present volume provides a structured view of current research trends on computational approaches to analogical reasoning. It starts with an overview of analogical reasoning with an extensive bibliography. The 14 collected contributions cover a large scope of issues. First, the use of analogical proportions and analogies is explained and discussed in various natural language processing problems, as well as in automated deduction.

**Features**
- Recent research on Computational Approaches to Analogical Reasoning
- Presents current trends on analogical reasoning
- Written by leading experts in the field

**Contents**

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

**Target groups**
Research

**Product category**
Monograph
A. K. Pramanick, National Institute of Technology Durgapur, Durgapur, India

**The Nature of Motive Force**

In this monograph Prof. Pramanick explicates the law of motive force, a fundamental law of nature that can be observed and appreciated as an addition to the existing laws of thermodynamics. This unmistakable and remarkable tendency of nature is equally applicable to all other branches of studies. He first conceptualized the law of motive force in 1989, when he was an undergraduate student. Here he reports various applications of the law in the area of thermodynamics, heat transfer, fluid mechanics and solid mechanics, and shows how it is possible to solve analytically century-old unsolved problems through its application.

**Features**
- Proposes the law of motive force as a fundamental law of nature and establishes its relation to other laws and principles in thermodynamics
- With the aid of both physical reasoning and the law of motive force, the book proposes exact solutions to classical unsolved problems of thermo fluid science
- Includes a foreword by Adrian Bejan, professor and discoverer of the constructional law of design and evolution in nature

**Contents**

**Fields of interest**
Engineering Thermodynamics, Heat and Mass Transfer; Thermodynamics; Continuum Mechanics and Mechanics of Materials

**Target groups**
Research

**Product category**
Monograph

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C. Rainieri, G. Fabbrocino, University of Molise, Termoli, Italy

**Operational Modal Analysis of Civil Engineering Structures**

An Introduction and Guide for Applications

This book covers all aspects of operational modal analysis for civil engineering, from theoretical background to applications, including measurement hardware, software development, and data processing. In particular, this book provides an extensive description and discussion of OMA methods, their classification and relationship, and advantages and drawbacks. The authors cover both the well-established theoretical background of OMA methods and the most recent developments in the field, providing detailed examples to help the reader better understand the concepts and potentialities of the technique. Additional material is provided (data, software) to help practitioners and students become familiar with OMA.

**Features**
- Analyzes OMA methods extensively, providing implementation detail not found in the literature
- Offers tutorial for development of customized measurement and data processing systems for Lab View and National Instruments
- Programmable hardware
- Discusses different solutions for automated OMA
- Contains many explanatory applications on real structures
- Provides detail on applications of OMA beyond system identification
- Includes both theory and applications

**Contents**
Introduction.- Mathematical Tools for Random Data Analysis.- Data Acquisition.- Data Processing.- Applications.- Automated OMA.

**Fields of interest**
Vibration, Dynamical Systems, Control; Solid Construction; Structural Mechanics

**Target groups**
Research

**Product category**
Monograph

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A. Rodić, Mihailo Pupin Institute, Belgrade, Serbia; D. Piska, Technical University of Cluj-Napoca, Cluj-Napoca, Romania; H. Bleuler, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland (Eds)

**New Trends in Medical and Service Robots**

**Challenges and Solutions**

**Contents**
M. Sarma, K. K. Sarma, Gauhati University, Guwahati, India

**Phoneme-Based Speech Segmentation using Hybrid Soft Computing Framework**

The book discusses intelligent system design using soft computing and similar systems and their interdisciplinary applications. It also focuses on the recent trends to use soft computing as a versatile tool for designing a host of decision support systems.

**Features**
- Provides lucid description of the theoretical concepts
- Discusses the use of soft computing and related tools to design intelligent systems for solving identified problems of speech processing
- Enables the learner to acquire range of knowledge of soft-computational approaches to speech recognition

**Contents**

**Fields of interest**
Computational Intelligence; Signal, Image and Speech Processing; Algorithm Analysis and Problem Complexity

**Target groups**
Research

**Product category**
Monograph

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S. Sazhin, University of Brighton, Brighton, UK

**Droplets and Sprays**

Providing a clear and systematic description of droplets and spray dynamic models, this book maximises reader insight into the underlying physics of the processes involved, outlines the development of new physical and mathematical models and broadens understanding of interactions between the complex physical processes which take place in sprays. Complementing approaches based on the direct application of computational fluid dynamics (CFD), Droplets and Sprays treats both theoretical and practical aspects of internal combustion engine process such as the direct injection of liquid fuel, subcritical heating and evaporation.

**Features**
- Enriches understanding of the underlying physics of processes involved in droplets and spray dynamic models
- Treats both theoretical and practical aspects of internal combustion engine processes, such as the direct injection of liquid fuel, subcritical heating and evaporation
- Includes case studies that illustrate the approaches relevance to automotive applications, it is also anticipated that the described models can find use in other areas such as in medicine and environmental science

**Contents**

**Fields of interest**
Engineering Fluid Dynamics; Fluid- and Aerodynamics; Engineering Thermodynamics, Heat and Mass Transfer

**Target groups**
Research

**Product category**
Monograph
**Lean Construction Management**

The Toyota Way

The book presents a mixed research method adopted to assess and present the Toyota Way practices within construction firms in general and for firms in China specifically. The results of an extensive structured questionnaire survey based on the Toyota Way-styled attributes identified were developed, and data collected from building professionals working in construction firms is presented.

**Features**
- First book that addresses the Toyota Way practices in the construction industry to achieve lean construction management
- Presents a conceptual framework for aligning lean construction management with the Toyota Way model
- Includes a checklist of attributes for construction firms and business to evaluate their state of readiness to move towards lean construction management using the Toyota Way
- Written by leading experts in the field

**Contents**
- Introduction
- Production Management
- Lean Production and Construction
- The Toyota Way
- Theoretical and Conceptual Framework
- China’s Construction Industry
- Research Methodology
- Survey Data Analysis
- Interview Findings
- Case Study
- Discussion and Validation
- Conclusions

**Fields of interest**
- Construction Management
- Project Management
- Engineering Economics
- Organization, Logistics, Marketing

**Target groups**
- Professional/practitioner

**Product category**
- Monograph

**Due May 2014**

2014. 410 p. Hardcover
- € (D) 139,09 | £ (A) 142,99 | sFr 173,50
- € 129,99 | £117.00

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**Engineering**

**Bigelow Aerospace and Expandable Modules**

Colonizing Space One Piece at a Time

Here for the first time you can read how a space technology start-up is pioneering work on expandable space station modules, how Bigelow licensed the multi-layer, expandable space module technology from NASA after Congress canceled the TransHab project, and how the entrepreneur continued to develop the technology for more than a decade. In Bigelow Aerospace, you can read how NASA came full circle to once again investigate connecting a Bigelow expandable craft to the International Space Station for safety, life support, radiation shielding, thermal control and communications testing. Also described is Bigelow’s unique business model that involves leasing out small space stations to research communities and corporations. At the core of Bigelow’s plan are the inflatable modules.

**Features**
- Describes the technology of inflatable modules and how establishing these habitats in orbit could generate an orbital economy
- Explains the details of one of the foremost emerging private space exploration ventures
- Offers informed speculation on possible lunar and Martian bases that the future may hold

**Contents**

**Fields of interest**
- Aerospace Technology and Astronautics
- Popular Science, general
- Innovation/Technology Management

**Target groups**
- Popular/general

**Product category**
- Popular science

**Due April 2014**

2014. XV, 227 p. 61 illus., 11 in color. (Advances in Delays and Dynamics, Volume 2)
- € (D) 106,99 | (A) 109,99 | sFr 133,50
- € 99,99 | £90.00
ISBN 978-3-11-055755-6

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**Low-Complexity Controllers for Time-Delay Systems**

**A. Seuret**, Centre national de la recherche scientifique, Toulouse, France; **H. Özbay**, Bilkent University, Ankara, Turkey; **C. Bonnet**, EPI DISCO, Gif-sur-Yvette, France; **H. Mounier**, Laboratory of Signals & Systems (L2S), Gif-sur-Yvette, France (Eds)

**Due July 2014**

2014. 400 p. 88 illus., 80 in color. (Springer Praxis Books / Space Exploration) Softcover
- € (D) 37,44 | (A) 38,49 | sFr 44,50
- € 34,99 | £30.99
ISBN 978-3-319-05196-7

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**E. Seedhouse**, Defence R&D Canada - Toronto, Toronto, ON, Canada

**Colonizing Space One Piece at a Time**

Here for the first time you can read how a space technology start-up is pioneering work on expandable space station modules, how Bigelow licensed the multi-layer, expandable space module technology from NASA after Congress canceled the TransHab project, and how the entrepreneur continued to develop the technology for more than a decade. In Bigelow Aerospace, you can read how NASA came full circle to once again investigate connecting a Bigelow expandable craft to the International Space Station for safety, life support, radiation shielding, thermal control and communications testing. Also described is Bigelow’s unique business model that involves leasing out small space stations to research communities and corporations. At the core of Bigelow’s plan are the inflatable modules.

**Features**
- Describes the technology of inflatable modules and how establishing these habitats in orbit could generate an orbital economy
- Explains the details of one of the foremost emerging private space exploration ventures
- Offers informed speculation on possible lunar and Martian bases that the future may hold

**Contents**

**Fields of interest**
- Aerospace Technology and Astronautics
- Popular Science, general
- Innovation/Technology Management

**Target groups**
- Popular/general

**Product category**
- Popular science
Optical Network Design and Planning

This book takes a pragmatic approach to deploying state-of-the-art optical networking equipment in metro-core and backbone networks. The book is oriented towards practical implementation of optical network design. Algorithms and methodologies related to routing, regeneration, wavelength assignment, sub rate-traffic grooming and protection are presented, with an emphasis on optical-bypass-enabled (or all-optical) networks.

Features
- Addresses the need for a pragmatic approach to deploying state-of-the-art optical networking equipment in backbone, regional and metro-core networks
- Investigates hot topics such as flexible/elastic optical networks, dynamic optical networking, multi-domain networks, and software defined networking
- Provides readily implementable methodologies for designing cost-effective and capacity-efficient optical networks
- Covers optical-bypass networks, including in-depth discussion of architectural, operational and economic issues

Contents

Fields of interest
Microwaves, RF and Optical Engineering; Communications Engineering, Networks; Signal, Image and Speech Processing

Target groups
Professional/practitioner

Product category
Professional book

Advanced Approaches to Intelligent Information and Database Systems

This book consists of 35 chapters presenting different theoretical and practical aspects of Intelligent Information and Database Systems. Nowadays both Intelligent and Database Systems are applied in most of the areas of human activities which necessitates further research in these areas.

Features
- Latest research on Intelligent Information and Database Systems
- This book is inspired by the 6th Asian Conference on Intelligent Information and Database Systems held April 7 - 9, 2014, Bangkok, Thailand
- Recent results on technologies and applications of intelligent information and database systems

Contents

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

Target groups
Research

Product category
Monograph

Coabsorbent and Thermal Recovery Compression Heat Pumping Technologies

The book introduces the reader in two of the most exciting energy technologies developed lately, the coabsorbent and the thermal recovery mechanical vapor compression heat pumping, emphasizing their high potential in environment protection by primary energy savings.

Features
- Presents theory and practical aspects for applications
- Offers new opportunities for heat pumping and power production
- Includes many illustrations, tables and diagrams supporting the understanding

Contents

Fields of interest
Engineering Thermodynamics, Heat and Mass Transfer; Industrial Chemistry/Chemical Engineering; Fluid- and Aerodynamics

Target groups
Research

Product category
Monograph
Mathematical and Computational Analyses of Cracking Formation
Fracture Morphology and Its Evolution in Engineering Materials and Structures

This book is about the pattern formation and the evolution of crack propagation in engineering materials and structures, bridging mathematical analyses of cracks based on singular integral equations, to computational simulation of engineering design.

Features
- The first book that focuses on the mathematical and numerical analyses of crack path prediction
- Contributes to a better understanding of crack path stability and resulting cracking formation in brittle solids
- Includes accurate prediction methods for the life and path of fatigue crack propagation, as well as possible crack arrest after unexpected brittle crack initiation

Contents

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

Target groups
Research

Product category
Monograph

Due May 2014
- € (D) 139,09 | € (A) 142,99 | sFr 173,50
- € 129,99 | £ 117,00
ISBN 978-4-431-54934-7

Continuum Analysis of Biological Systems
Conserved Quantities, Fluxes and Forces

This book addresses the analysis, in the continuum regime, of biological systems at various scales, from the cellular level to the industrial one. It presents both fundamental conservation principles (mass, charge, momentum and energy) and relevant fluxes resulting from appropriate driving forces, which are important for the analysis, design and operation of biological systems. It includes the concept of charge conservation, an important principle for biological systems that is not explicitly covered in any other book of this kind. The book is organized in five parts: mass conservation; charge conservation; momentum conservation; energy conservation and multiple conservations simultaneously applied.

Features
- Makes the reader familiar with the analysis of biological systems, as well as with biological systems design and operation
- Presents all the conservation principles of current interest for the continuum analysis of biological systems
- Facilitates an easy understanding of useful concepts that are usually considered difficult
- Promotes a thinking out of the box approach to the analysis of biological systems
- It is endorsed by Professor Robert Byron Bird, a leading authority in the field of transport phenomena

Contents

Fields of interest
Biomedical Engineering; Industrial Chemistry/Chemical Engineering; Cell Physiology

Target groups
Research

Product category
Monograph

Due March 2014
2014. XIV, 267 p. 61 illus. (Biosystems & Biorobotics, Volume 5) Hardcover
- € (D) 106,99 | € (A) 109,99 | sFr 133,50
- € 99,99 | £ 90,00
ISBN 978-3-642-54467-5

Ultra Wideband Wireless Body Area Networks

This book explores the design of ultra wide-band (UWB) technology for wireless body-area networks (WBAN). The authors describe a novel implementation of WBAN sensor nodes that use UWB for data transmission and narrow band for data reception, enabling low power sensor nodes, with high data rate capability. The discussion also includes power efficient, medium access control (MAC) protocol design for UWB based WBAN applications and the authors present a MAC protocol in which a guaranteed delivery mechanism is utilized to transfer data with high priority.

Features
- Describes UWB sensor platform development and evaluation for on-body communication
- Discusses power efficient medium access control (MAC) protocol design for UWB based WBAN applications
- Includes feasibility analysis of the UWB technology for human implant applications through study of electromagnetic and thermal effects caused by UWB signals

Contents

Fields of interest
Circuits and Systems; Biomedical Engineering; Signal, Image and Speech Processing

Target groups
Professional/practitioner

Product category
Professional book

Due August 2014
2014. 200 p. 100 illus. Hardcover
- approx. € (D) 96,29 | € (A) 98,99 | sFr 117,50
- approx. € 89,99 | £ 79,50
ISBN 978-3-319-05286-1
**Structural Properties of Porous Materials and Powders Used in Different Fields of Science and Technology**

This book provides a comprehensive and concise description of most important aspects of experimental and theoretical investigations of porous materials and powders, with the use and application of these materials in different fields of science, technology, national economy and environment.

**Features**
- Provides a full, yet concise, description of experimental and theoretical investigations of porous materials and powders.
- Describes the use and application of porous materials in different scientific fields.
- Is written in a simple and transparent way, designed to be understood by people without the benefit of specialized training.

**Contents**
- Experimental Methods for Investigation of Porous Materials and Powders.
- Technical materials.
- Natural materials.
- Biological materials.
- Conclusion.

**Fields of interest**
- Operating Procedures, Materials Treatment;
- Characterization and Evaluation of Materials;
- Soft and Granular Matter, Complex Fluids and Microfluidics.

**Due October 2014**

**Print**
- 2014. 1000 p. 300 illus. (In two volumes not available separately)
  - approx. *€ (D) 533.93 | € (A) 548.90 | sFr 664.50
  - approx. € 499.00 | £449.50

**eReference**
- 2014.
  - approx. **€ (D) 593.81 | € (A) 598.80 | sFr 698.00
  - approx. € 499.00 | £449.50

**Due July 2014**

**Print + eReference**
- 2014. 1000 p. 300 illus. (In two volumes not available separately)
  - approx. *€ (D) 667.68 | € (A) 686.40 | sFr 831.00
  - approx. € 624.00 | £562.00

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**Handbook of Damage Mechanics**

**Nano to Macro Scale for Materials and Structures**

**Contents**
- Continuum Damage Mechanics Fundamentals.
- Some Basic Issues of Isotropic and Anisotropic Continuum Damage Mechanics.
- Undamageable Materials and Damage Processes in Series and in Parallel.
- Damage for Disordered Materials.

**Features**
- Provides a full, yet concise, description of experimental and theoretical investigations of porous materials and powders.
- Describes the use and application of porous materials in different scientific fields.
- Is written in a simple and transparent way, designed to be understood by people without the benefit of specialized training.

**Contents**

**Target groups**
- Professional/practitioner

**Product category**
- Handbook

**Due October 2014**

**Print**
- 2014. 1000 p. 300 illus. (In two volumes not available separately)
  - approx. *€ (D) 533.93 | € (A) 548.90 | sFr 664.50
  - approx. € 499.00 | £449.50

**eReference**
- 2014.
  - approx. **€ (D) 593.81 | € (A) 598.80 | sFr 698.00
  - approx. € 499.00 | £449.50

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**Optimization and Optimal Control in Automotive Systems**

**Contents**
- Trajectory Optimization: A Survey.
- Extremum Seeking Methods for Online Automotive Calibration.
- Model Predictive control of Autonomous Vehicles.
- Approximate Solution of HJB and Optimal Control in Internal Combustion Engines.
- Intelligent Speed Advising Based on Cooperative Traffic Scenario.
- Driver Control and Trajectory Optimization Applied to Lane Change Maneuver.
- Real-Time Near-Optimal Feedback Control of Aggressive Vehicle Maneuvers.
- Applications of Computational Optimal Control to Vehicle Dynamics.
- Topology Optimization of Hybrid Power Trains.
- Optimal Control of Diesel Engines with Waste Heat Recovery System.
- Learning Based Approaches to Engine Mapping and Calibration Optimization.
- Online Design of Experiments in the Relevant Output Range.
- Optimal Control of HCCI.
- Optimal Lifting and Path Profiles for a Wheel Loader Considering Engine and Turbo Limitations.

**Fields of interest**
- Control; Calculus of Variations and Optimal Control; Optimization; Automotive Engineering.

**Target groups**
- Research

**Product category**
- Monograph

**Due April 2014**

**Print**
- 2014. XVI, 321 p. 157 illus., 103 in color. (Lecture Notes in Control and Information Sciences, Volume 455)
  - Softcover
  - *€ (D) 128.39 | € (A) 131.99 | sFr 160.00
  - € 119.99 | £108.00
  - ISBN 978-3-319-05370-4

**eReference**
- 2014.
  - *€ (D) 131.99 | € (A) 135.00 | sFr 168.00
  - ISBN 978-3-319-05371-1
Directed Information Measures in Neuroscience

Analysis of information transfer has found rapid adoption in neuroscience, where a highly dynamic transfer of information continuously runs on top of the brain's slowly-changing anatomical connectivity. Measuring such transfer is crucial to understanding how flexible information routing and processing give rise to higher cognitive function. Directed Information Measures in Neuroscience reviews recent developments of concepts and tools for measuring information transfer, their application to neurophysiological recordings and analysis of interactions.

Features
► Reflects the most recent developments in the quantification of information transfer via directed information measures ► Provides the reader with the state-of-the-art concepts and tools for measuring information transfer in the brain and includes applications to real data sets ► Makes the reader familiar with the concept of transfer entropy – the most popular measure of information transfer ► Edited and written by the most active researchers in the field

Contents
Part I Introduction to Directed Information Measures - Part II Information Transfer in Neural and Other Physiological Systems - Part III Recent Advances in the Analysis of Information Processing.

Fields of interest
Complexity; Coding and Information Theory; Biomedical Engineering

Target groups
Research

Product category
Monograph

Due March 2014
2014. XII, 200 p. (Understanding Complex Systems) Hardcover
► € (D) 106.99 | € (A) 109.99 | sFr 133,50
► € 99.99 | £90.00
ISBN 978-3-642-54473-7

J. M. Williams, Silicon Valley Polytechnic Institute, Wilsonville, OR, USA

Digital VLSI Design with Verilog
A Textbook from Silicon Valley Polytechnic Institute

This book is structured as a step-by-step course of study along the lines of a VLSI integrated circuit design project. The entire Verilog language is presented, from the basics to everything necessary for synthesis of an entire 70,000 transistor, full-duplex serializer-deserializer, including synthesizable PLLs. The author includes everything an engineer needs for in-depth understanding of the Verilog language: Syntax, synthesis semantics, simulation and test. Complete solutions for the 27 labs are provided in the downloadable files that accompany the book.

Features
► Covers the entire Verilog language – using most of it in practice ► Provides 27 lab exercises, with complete and tested answers ► Explains and emphasizes synthesizability, wherever it pertains to language features ► Develops as a major project a synthesizable 70,000-gate Ser Des ► Presents synthesis-relevant usage of System Verilog and the basic functionality of Verilog-AMS

Contents
Introductory Material - Week 1 Class 1 - Week 1 Class 2 - Week 2 Class 1 - Week 2 Class 2 - Week 3 Class 1 - Week 3 Class 2 - Week 4 Class 1 - Week 4 Class 2 - Week 5 Class 1 - Week 5 Class 2 - Week 6 Class 1 - Week 6 Class 2 - Week 7 Class 1 - Week 7 Class 2 - Week 8 Class 1 - Week 8 Class 2 - Week 9 Class 1 - Week 9 Class 2 - Week 10 Class 1 - Week 10 Class 2 - Week 11 Class 1 - Week 11 Class 2 - Week 12 Class 1 - Week 12 Class 2.

Fields of interest
Circuits and Systems; Processor Architectures; Electronics and Microelectronics, Instrumentation

Target groups
Research

Product category
Professional book

Due May 2014
2014. X, 482 p. 277 illus., 125 in color. Hardcover
► € (D) 106.99 | € (A) 109.99 | sFr 133,50
► € 99.99 | £90.00
ISBN 978-3-319-04788-1

F. Yang, Tsinghua University, Beijing, China; P. Duan, S. L. Shah, T. Chen, University of Alberta, Edmonton, AB, Canada

Capturing Connectivity and Causality in Complex Industrial Processes

This brief reviews concepts of inter-relationship in modern industrial processes, biological and social systems. Specifically ideas of connectivity and causality within and between elements of a complex system are treated; these ideas are of great importance in analysing and influencing mechanisms, structural properties and their dynamic behaviour, especially for fault diagnosis and hazard analysis.

Features
► Provides an exhaustive overview of concepts and descriptions of connectivity and causality in complex processes ► Explains how to obtain an acceptable process topology from the fusion of different information resources ► Tutorial style deepens understanding of classical and recent research results with existing and potential applications

Contents
Introduction - Examples of Applications for Connectivity and Causality Analysis - Description of Connectivity and Causality - Capturing Connectivity and Causality from Process Knowledge - Capturing Causality from Process Data - Case Studies.

Fields of interest
Complexity; Mathematical Modeling and Industrial Mathematics; Control

Target groups
Research

Product category
Brief
D. Yu, Microsoft Research, Bothell, USA; L. Deng, Microsoft Corporation, Redmond, WA, USA

Automatic Speech Recognition
A Discriminative and Hierarchical Modeling Approach

This book summarizes the recent advancement in the field of automatic speech recognition with a focus on discriminative and hierarchical models.

Features
- Discusses important theoretical foundation and practical considerations of using discriminative and hierarchical models for speech recognition
- Reviews past and present work on discriminative and hierarchical models for both acoustic and language modeling
- Analyzes the research direction and trends towards establishing future-generation speech recognition

Contents
Section 1: Automatic speech recognition:
- Background
- Feature extraction: basic frontend
- Acoustic model: Gaussian mixture hidden Markov model
- Language model: stochastic N-gram
- Historical reviews of speech recognition research: 1st, 2nd, 3rd, 3.5th, and 4th generations
- Section 2: Advanced feature extraction and transformation
- Unsupervised feature extraction
- Discriminative feature transformation
- Section 3: Advanced acoustic modeling
- Conditional random field (CRF) and hidden conditional random field (HCRF)
- Deep-Structured CRF
- Semi-Markov conditional random field
- Deep stacking models
- Deep neural network – hidden Markov hybrid model
- Section 4: Advanced language modeling
- Discriminative Language model
- Log-linear language model
- Neural network language model

Fields of interest
Signal, Image and Speech Processing; Engineering Acoustics; Computer Appl. in Social and Behavioral Sciences

Target groups
Research

Product category
Monograph

Due August 2014
2015. Approx. 200 p. (Signals and Communication Technology) Hardcover
- approx. € (D) 106,95 | € (A) 109,95 | sFr 133,50
- approx. £ 99,99 | £ 90.00
ISBN 978-1-4471-5778-6

J. Zheng Li, University of Bridgeport, Bridgeport, CT, USA

CAD, 3D Modeling, Engineering Analysis, and Prototype Experimentation
Industrial and Research Applications

This succinct book focuses on computer aided design (CAD), 3-D modeling, and engineering analysis and the ways they can be applied effectively in research and industrial sectors including aerospace, defense, automotive, and consumer products.

Features
- Equips practitioners and researchers to handle powerful tools for engineering design and analysis using many detailed illustrations
- Emphasizes important engineering design principles in introducing readers to a range of techniques
- Includes tutorials providing readers with appropriate scaffolding to accelerate their learning process
- Adopts a product development, cost-consideration perspective through the book’s many examples

Contents
Introduction
- New System Design and Development
- Computer-aided Modeling, Simulation and Analysis to Assist Product and System Design and Development
- Prototyping and Experimental Methodologies to Validate New Product and System in Design and Development
- Discussion and Future Improvement
- Conclusion

Fields of interest
Engineering Design; Computer-Aided Engineering (CAD, CAE) and Design; Simulation and Modeling

Target groups
Professional/practitioner

Product category
Professional book

Due August 2014
2015. X, 320 p. 228 illus., 207 in color. Hardcover
- approx. € (D) 96,29 | € (A) 98,99 | sFr 117,50
- approx. £ 89,99 | £ 79.50
ISBN 978-3-319-05920-4