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- Environmental and Life Sciences
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A SET brings together, under a single title, a limited number of volumes (from a minimum of 3 to a maximum of approximately 10). Topics are "specialized". The content in each set covers the research and very latest innovations of the topic.

FOCUS books, from minimum 50 approx. to 200 pages maximum, which deal with the fundamental, conceptual and technological aspects of the topic.

Monographs and multi-author books, usually between 250 and 400 pages long, deal with the fundamental, experimental and applicative aspects of each topic.

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Scientific and Technical Topics
(non-exhaustive list)

Bioengineering
Biomaterials
Biomechanics
Biostatistics
Biotechnology

Computer Aided Surgery
Medical Imaging
Signal Processing and Sensors
Tissue Engineering

Forthcoming Titles

Biomaterials by Migonney Véronique
Biomechanics by Rakotomanana Lalaonirina
Biomechanics and Mechanobiology of the Lumbar Spine by Noailly Jérôme
Complex Biological Systems on the Nanometer Scale with Atomic Force Microscopy by El Kirat Karim
Computer-Assisted Orthopedic Surgery by Stindel Eric, Dardenne Guillaume
Kinematic Analysis of Human Movement by Chêze Laurence
Mechanical Properties of Soft Tissues with MR Elastography Technique by Bensamoun Sabine
Mophogenesis – Biomechanics of the Hand by Durand Sébastian
Statistical Modeling of Biological Sequences by Nuel Grégory

ISTE catalog May 2014
CO₂ Biofixation by Microalgae

MODELING, ESTIMATION AND CONTROL

Sihem Tebbani, Rayen Filali, Didier Dumur, Supelec and Filipa Lopes, Dominique Pareau, Ecole Centrale Paris, France

May 2014 • 192 pages • USD 95.00
ISBN: 9781848215986 • Title co-published with Wiley

Due to the consequences of global warming and significant greenhouse gas emissions, several ideas have been studied to reduce emissions or to suggest solutions for pollutant removal. The most promising ideas are reduced consumption, waste recovery and waste treatment by biological systems. In this latter category, studies have demonstrated that the use of microalgae is a very promising solution for the biofixation of carbon dioxide. Indeed, these micro-organisms are able to offset high levels of CO₂ thanks to photosynthesis. To obtain an optimal CO₂ sequestration using microalgae, their cultivation has to be carried out in a favorable environment, corresponding to optimal operating conditions (temperature, nutrients, pH, light, etc.). Therefore, microalgae are grown in an enclosure, i.e. photobioreactors, which notably operate in continuous mode. This type of closed reactor notably enables us to reduce culture contamination, to improve CO₂ transfer and to better control the cultivation system.

This book presents the advanced concepts in Automation to ensure optimal operation of bioprocesses. It describes the entire process: experimental testing, modeling, identification, implementation of software sensor and finally the development of a control law, in order to maintain the system in optimal conditions despite modeling errors and environmental disturbances that can have an influence on the system (pH variations, temperature, light, biofilm appearance, etc.).

Contents

1. Microalgae.
2. CO₂ Biofixation.
4. Estimation of Biomass Concentration.
5. Bioprocess Control.

Biomechanics of the Musculoskeletal System

MODELING OF DATA UNCERTAINTY AND KNOWLEDGE

Tien Tuan Dao and Marie-Christine Ho Ba Tho, University of Technology of Compiègne (UTC), France

April 2014 • 176 pages • USD 75.00
ISBN: 9781848216020 • Title co-published with Wiley

Biomechanics of the Musculoskeletal System is a forerunner regarding data uncertainty and knowledge modeling in the biomechanics of the musculoskeletal system. It begins with the state of the art in related topics such as data uncertainty, knowledge modeling, and the biomechanics of the musculoskeletal system.

This is followed by the presentation of fundamental and conceptual aspects of data uncertainty modeling in biomechanics.

Chapter 3 addresses the conceptual and theoretical aspects of knowledge modeling in the biomechanics of the musculoskeletal system.

The fourth chapter introduces clinically relevant applications in the biomechanics of the musculoskeletal system by using the conceptual and theoretical backgrounds of data uncertainty knowledge modeling.

Finally, the concluding chapter presents the software and computing tools which could be used for practical works regarding knowledge modeling and reasoning/inference functionalities of a specific application.

Contents

1. Biomechanics of the Musculoskeletal System.
Scientific Committee

Coordinator
Jacques Janssen, Solvay Brussels School of Economics and Management, Belgium

Members
Jean-Marie Doublet, Consultant, Paris, France
David Ménascé, Consultant, Paris, France

Scientific and Technical Topics
(non-exhaustive list)

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Forthcoming Titles

Asset Liability Management for Banking and Insurance  
by Habart-Corlosquet Marine, Janssen Jacques and Manca Raimondo

Hazardous Forecasts and Crisis Scenario Generator by Clément-Grandcourt Arnaud, Fraysse Hervé

Risk Management under UCITS IV by Szylar Christian

Forthcoming Sets

Applied New Finance coordinated by Jacques Janssen
This book shows how new value at risk (VaR) techniques can be built more appropriately for a crisis situation. VaR methodology for non-Gaussian finance looks at the importance of VaR in standard international rules for banks and insurance companies; gives the first non-Gaussian extensions of VaR and applies several basic statistical theories to extend classical results of VaR techniques such as the NP approximation, the Cornish-Fisher approximation, extreme and a Pareto distribution. Several non-Gaussian models using Copula methodology, Lévy processes along with particular attention to models with jumps such as the Merton model are presented; as are the consideration of time homogeneous and non-homogeneous Markov and semi-Markov processes and for each of these models.

**Contents**

1. Use of Value-At-Risk (VAR) Techniques for Solvency II, Basel II and III.
3. VAR Extensions from Gaussian Finance to Non-Gaussian Finance.

---

Decision-Making and Action
Jean-Charles Pomerol, UPMC, France

This book provides a bridge between the latest results in artificial intelligence, neurobiology, psychology and decision-making for action. It dissectes all issues that arise almost daily for decision-makers, at least for major decisions. Drawing on numerous examples, this book answers, in plain language and imagery, all your questions.

**Contents**

1. What is a Decision, or What Does Decision Theory Have to Teach Us?
3. The Process of Decision-Making and its Rationality, or What Does Artificial Intelligence Have to Teach Us?
4. Intuition, Emotion, Recognition and Reasoning or, What Does the Neurobiology of Decision-Making Have to Teach Us?
5. Decision-Making in the Presence of Confliction Criteria, or What Does a Multicriterion Decision Aid Have to Teach Us?
6. The Decision-Maker’s Psychology, or What Does Psychology Have to Teach Us?
8. Action: Giving the Impetus or Managing.

---

Strategic Decisions and Weak Signals
Humbert Lesca, Pierre Mendés-France University, Grenoble, Nicolas Lesca, Claude Bernard University, Lyon, France

The study of the exploitation of weak signals in organizational strategy is a tricky business, and one which has only been practiced in organizations surprisingly recently.

The concepts involved are relatively numerous, and the definitions given for such concepts may well vary from one author to the next. The real-world application of these concepts is rarely touched on in the existing body of literature, and this void is a hindrance to the development of Anticipative Strategic Scanning, in commercial companies and public organizations.

For this reason, this book introduces working methods and computer-based tools to facilitate experimentation and operational implementation. Chapter 1 discusses the concepts and issues surrounding the placement of the subject within the field of Management Science. Chapter 2 presents a state of the art on the topic, gleaned from the publications of academic researchers. Chapter 3 gives a presentation of three operational tools and looks at case-studies for their application.

**Contents**

1. The Subject Within the Field of Management Science: Concepts and Issues.
2. State of the Art: Systems Suggested by Previous Authors.
3. Proposed Systems: Results of Information System Prototyping Research Conducted at the CNRS-CERAG Lab (France).

---

UCITS Handbook
Edited by Christian Szylar, Marshall Wace LLP, UK

This handbook intends to introduce systematically recent developments in different areas of UCITS through a multidisciplinary approach.

The coverage is broad and thorough with a balance of theory and applications. Each chapter covering a special aspect of UCITS is edited by leading experts and practitioners in the area and covers state-of-the-art methods and theory of the selected topic.

The purpose of this UCITS handbook is to provide, in a clear format, a summary of the main aspects of each discipline that UCITS involves.

**Contents**

1. Setting up a UCITS Fund.
2. UCITS Management Companies.
3. Risk Management in the Context of UCITS IV.
5. UCITS – The Investment Limits.
6. UCITS Distribution.
7. The UCITS Management Company and Delegation.
8. UCITS Taxation.
9. Alternative UCITS.
This important title explores the relationship between scanning and sustainable development. Over ten chapters the different authors examine the application, characteristics and the implementation of sustainable development oriented scanning.

**Contents**

1. Sustainable Development: A Vague and Ambiguous "Theory".
2. Parameters and Particularities of Sustainable Development-Oriented Strategic Scanning.
3. Sustainable Development of Large Network Service Companies: Inhabiting Territories via Middle Managers, Strategic Scanners.
4. Small Business and Sustainable Development.
5. Human Resources Scanning: A Tool for the Implementation of Sustainable Development?
8. Targeting "Sustainable Scanning": A Methodology Based on Logistics and Supply Chain Management.
10. Sustainable Chemistry and Weak Signals: CO2 as a Raw Material to Value.

---

**Innovation Ecosystems**

Eunika Mercier-Laurent, IEA Lyon, France

This book introduces the concept of "e-co-innovation". The motivation behind this book is to introduce a global and system overview of the subject, to present the various aspects of innovation from different angles and perspectives to finally bring the reader to an understanding of all ecosystem components, their metamorphoses, cross-influences and possible impacts on the balanced development of people, businesses, regions and countries.

**Contents**

1. Global Landscape of Innovation.
3. From Innovation to E-co-innovation.
4. Knowledge and Skills to E-co-innovate.
5. Knowledge Management – Collective Human-Machine Intelligence.
6. Innovating Technological Innovation.

---

**Weak Signals for Strategic Intelligence**

Humbert Lesca, Pierre Mendès France University, Grenoble and Nicolas Lesca, Claude Bernard University, Lyon, France

The concept of a "weak signal" is at the heart of the proposed methods. After presenting examples of this concept, the authors provide original and validated answers to questions of feasibility: How to recognize a weak signal? How to exploit it? Numerous applications are presented.

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## BUSINESS AND MANAGEMENT

**Backlist Titles**

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<td>Business Intelligence</td>
<td>Corine Cohen, International University of Monaco</td>
<td>9781848211148</td>
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<td>304</td>
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<td>Sustainable Development in the USA</td>
<td>Jean-Marc Zaninetti, University of Orléans, France</td>
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<td>Edited by Chantal Ammi, INT Evry, France</td>
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<td>304</td>
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<td>Risk Management under UCITS III / IV</td>
<td>Christian Szylar, Kinetic Partners LLP, United Kingdom</td>
<td>9781848212107</td>
<td>April 2010</td>
<td>288</td>
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<td>Edited by Imed Boughzala and Jean-Louis Ermine, Institut National des Télécommunications, Evry, France</td>
<td>9781905209033</td>
<td>March 2006</td>
<td>296</td>
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<td>Edited by Patrick Corsi, KINNSYS, Brussels, Belgium et al.</td>
<td>October 2006</td>
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<td>November 2008</td>
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Scientific Committee

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Scientific and Technical Topics
(non-exhaustive list)

Biological Engineering
Catalysis and Reaction Engineering
Electrochemical Processes
Energy and Environmental Engineering
Interface and Particle Interaction Engineering
Microprocesses
Multiphysics Modeling
New Technologies
Polymers
Product Engineering
Systems Design and Engineering
Thermodynamics and Molecular Computations
Transport Processes

Forthcoming Titles

Biosystems Engineering by Dussap Gilles, Legrand Jack, Marc Ivan, Molina Carole, Albasi Claire
Environmental Impact of Polymers by Hamaide Thierry, Deterre Rémi, Feller Jean-François
New Approach in the Process Industries by Dal Pont Jean-Pierre, Azzaro-Pantel Catherine
Pharmaceutical Engineering
  by Biscans Béatrice, Teychené Sébastien, Saleh Kashayar, Aimar Pierre, de Rick Alain

Forthcoming Sets

Biosystems Engineering coordinated by Béatrice Biscans and Gilles Dussap
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Mohamed Naaim, Irstea Grenoble, France
François Nicot, Irstea Grenoble, France

Scientific and Technical Topics
(non-exhaustive list)

Geomaterials
(soils, rocks, concretes)
Geomechanics
Geotechnical Engineering
Hydrology
Natural Disasters (Analysis, Modeling and Mitigation)
Roads and Pavement Engineering
Soil and Human Activities Interaction
Soil and Rock Engineering
Soil and Structures Interaction
Soil Pollution (Processes and Modeling)
Structural Engineering

Discrete Element Modeling
Finite Element Modeling
Multi-physics Modeling
Multi-scale Approaches

Advanced Experimental Techniques
Bifurcation
Cohesive Materials
Failure Mechanics
Granular and Porous Materials
Instability
Multiphase and Reactive Flow in
Porous Materials
Unsaturated Materials

Forthcoming Titles and Sets
Forthcoming Titles

Design of Protection Works Against Torrent Floods by Tacnet Jean-Marc, Queffelean Yann, Deymier Christian, Carladous Simon
Dynamics of Habitat-forest Interface Zones by Jappiot Marielle, Long-Fournel Marlène
Fracture and Instability by Nicot François et al.
Fresh Concrete Rheology by Roussel Nicolas
Geomechanics of Landslides by di Prisco Claudio
Hydraulic Fracturing by Pijaudier-Cabot Gilles
Innovation and Environment by Mercier-Laurent Eunika
Low Environmental Impact Concrete by Loukili Ahmed
Mechanics of Snow Avalanches by Naaim Mohamed
Structures Design and Degradation Mechanisms in Coastal Environment by Ait-Mokhtar Karim, Millet Olivier

Forthcoming Sets

- Discrete Granular Mechanics coordinated by Félix Darve
- Natural Disasters coordinated by François Nicot
Equilibrium and Transfer in Porous Media

by Jean-François Daïan, Laboratoire d’Étude des Transferts en Hydrologie et Environnement, Grenoble, France

A porous medium is composed of a solid matrix and its geometrical complement: the pore space. This pore space can be occupied by one or more fluids.

The understanding of transport phenomena in porous media is a challenging intellectual task. This series provides a detailed analysis of the aspects required for the understanding of many experimental techniques in the field of porous media transport phenomena.

It is aimed at students or engineers who may not be looking specifically to become theoreticians in porous media, but wish to integrate knowledge of porous media with their previous scientific culture, or who may have encountered them when dealing with a technological problem.

While avoiding the details of the more mathematical and abstract developments of the theories of macroscopization, the author gives as accurate and rigorous an idea as possible of the methods used to establish the major laws of macroscopic behavior in porous media.

He also illustrates the constitutive laws and equations by demonstrating some of their classical applications.

The priority is to put the constitutive laws in concrete circumstances without going into technical detail.

---

**Equilibrium and Transfer in Porous Media**

**Volume 1**

Equilibrium States

March 2014 • 240 pages • USD 115.00

ISBN: 9781848216754 • Title co-published with Wiley

This first volume in the three-volume series focuses on fluids in equilibrium in the pore space; interfaces, the equilibrium of solutions and freezing in porous media; and gives experimental investigations of capillary behavior and porometry, and sorption and porometry.

**Contents**

1. Fluids in Equilibrium in the Pore Space: Capillary Behavior.
2. Interfaces, Equilibrium of Solutions and Freezing in Porous Media: Thermodynamic Aspects.

**Equilibrium and Transfer in Porous Media**

**Volume 2**

Transfer Laws

March 2014 • 240 pages • USD 115.00

ISBN: 9781848216761 • Title co-published with Wiley

This second volume in the three-volume series focuses on transport and transfer from homogeneous phases to porous media, and isothermal transport in the pore space.

**Contents**

2. Isothermal Transport in the Pore Space.

**Equilibrium and Transfer in Porous Media**

**Volume 3**

Applications, Isothermal Transport and Coupled Transfers

March 2014 • 336 pages • USD 145.00

ISBN: 9781848216778 • Title co-published with Wiley

This third volume in the three-volume series focuses on the applications of isothermal transport and coupled transfers in porous media.

**Contents**

1. Isothermal Transport in Porous Media: Applications.
Using plant material as raw materials for construction is a relatively recent and original topic of research. This book presents an overview of the current knowledge on the material properties and environmental impact of construction materials made from plant particles, which are renewable, recyclable and easily available. It focuses on particles and as well on fibers issued from hemp plant, as well as discussing hemp concretes.

Contents

1. Environmental, Economic and Social Context of Agro-Concretes.
2. Characterization of Plant-Based Aggregates.
4. Formulation and Implementation.
5. Mechanical Behavior.
This book analyses the problem of the erosion of geomaterials, focusing on the mechanical/physical aspect. The chapters oscillate between a phenomenological outlook that is well grounded in experiments, and an approach that can offer a modeling framework.

Contents

1. Introduction to the Process of Internal Erosion in Hydraulic Structures: Embankment Dams and Dikes.
4. Contact Erosion between Two Soils.
5. Concentrated Leak Erosion.
8. Two-Phase Modeling of Bedload Transport.
10. Sediment Transport and Morphodynamics in Nearshore Areas.

Physical Properties of Concrete and Concrete Constituents

Jean-Pierre Ollivier, INSA Toulouse, Jean-Michel Torrenti, ENPC and Myriam Carcassés, University of Toulouse, France

March 2012 • 352 pages • USD 147.00
ISBN: 9781848213302 • Title co-published with Wiley

Topics covered by this title include the characterization of granular materials, the concepts of porosity and specific surface area, and the transport properties (diffusion and permeation) of concrete. Some of these topics are already covered in other general books dedicated to granular or porous materials. The objective here is to bring them together in one book by adapting them for use by concrete specialists.

Applications in the form of exercises are offered at the end of each chapter.

Contents

1. Description of Granular Materials, Definitions.
2. Granulometry.
5. Voids in Concrete.
7. Permeability.

Seismic Vulnerability of Structures

Edited by Philippe Guéguen, Joseph Fourier University, Grenoble, France

February 2013 • 368 pages • USD 145.00
ISBN: 9781848215245 • Title co-published with Wiley

This book is focused on the seismic vulnerability assessment methods, applied to existing buildings, describing several behaviors and new approaches for assessment on a large scale (urban area).

Contents

6. Approach Based on the Risk Used in Switzerland.
Construction Reliability

SAFETY, VARIABILITY AND SUSTAINABILITY

Edited by Julien Baroth, Grenoble University, Denys Breyssse, Bordeaux 1 University and Franck Schoefs, Nantes University, France

June 2011 • 368 pages • USD 132.00
ISBN: 9781848212305 • Title co-published with Wiley

This multi-authors title proposes a summary of methods, both well-known and new, and apply them in various domains: dams, geotechnical study, structures from nuclear or civil engineering, etc.

Contents

Part 1. Qualitative Methods for Evaluating the Reliability of Civil Engineering Structures
3. Application to a Hydraulic Civil Engineering Project.
Part 2. Heterogeneity and Variability of Materials: Consequences for Safety and Reliability
4. Uncertainties in Geotechnical Data.
Part 3. Metamodels for Structural Reliability
Part 4. Methods for Structural Reliability over Time
9. Data Aggregation and Unification.
10. Time-Variant Reliability Problems.
Part 5. Reliability-based Maintenance Optimization
15. Practical Aspects: Industrial Implementation and Limitations in a Multi-criteria Context.

Rockfall Engineering

Edited by Stéphane Lambert and François Nicot, CEMAGREF, Grenoble, France

August 2011 • 464 pages • USD 195.00
ISBN: 9781848212565 • Title co-published with Wiley

Rockfall Engineering is an up-to-date, international picture of the state of the art in rockfall engineering.

Contents

5. Methods for Predicting Rockfall Trajectories and Run-out Zones.
7. Rockfall Hazard Zoning for Land Use Planning.

Damage Mechanics of Cementitious Materials and Structures

Edited by Gilles Pijaudier-Cabot and Frédéric Dufour

The contents emphasize multiscale and coupled approaches toward the serviceability and the safety of concrete structures.

Contents

1. Bottom-Up: From Atoms to Concrete Structures.
5. Macro and Mesoscale Models to Predict Concrete Failure and Size Effects.
9. Measuring Earthquake Damages to a High Strength Concrete Structure.

ICWIM 6

PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON WEIGH-IN-MOTION

Edited by Bernard Jacob, Anne-Marie McDonnell, Franziska Schmidt and Cunagin Wiley

July 2012 • 560 pages • USD 245.00
ISBN: 9781848214156 • Title co-published with Wiley

The proceedings of this conference provides access to current research and best practices, in an international forum for WIM technology, standards, research, policy and applications.

Contents

1. WIM Algorithms, Technology and Testing.
2. WIM for Enforcement.
3. WIM Standard, Calibration, Data Quality and Management.
5. Application of WIM to Bridges.
6. Application of WIM to Pavements.

Contents of other books are also listed in the image.
## Plasticity of Crystalline Materials

Edited by Ioan R. Ionescu, Patrick Franciosi, Salima Bouvier and Oana Cazacu

The present book provides an overview of recent developments of interest for the specific problem of plasticity of crystalline materials.

### Contents

1. Design, Rheology and Casting of Self-Compacting Concretes.  
2. Early Age Behavior.  
3. Mechanical Properties and Delayed Deformations.  
4. Durability of Self-Compacting Concrete.  
5. High Temperature Behavior of Self-Compacting Concretes.

## Self-Compacting Concrete

Edited by Ahmed Loukili, Institute for Research in Civil and Mechanical Engineering (GeM), Nantes University, France

Self-Compacting Concrete (SCC) is a relatively new building material. Nowadays, it is progressively changing the method of concrete placement on building sites. However, the successful use of SCC requires a good understanding of the behavior of this material, which is far different from traditional concrete.

### Contents

1. Design, Rheology and Casting of Self-Compacting Concretes.  
2. Early Age Behavior.  
3. Mechanical Properties and Delayed Deformations.  
4. Durability of Self-Compacting Concrete.  
5. High Temperature Behavior of Self-Compacting Concretes.

## Multiscale Geomechanics

Edited by Pierre-Yves Hicher, Ecole Centrale de Nantes, France

The first part of the book examines the behavior of soils at the level of their different constituents and at the level of their interaction. The second part deals with soil mechanics from the vantage point of the construction project.

### Contents

1. Jean Biarez: His Life and Work.  
2. From Particle to Material Behavior: the Paths Chartered by Jean Biarez.  
5. Models by Jean Biarez for the Behavior of Clean Sands and Remolded Clays at Large Strains.  
6. The Concept of Effective Stress in Unsaturated Soils.  

## Formulation

Edited by Anne-Marie Pensé-Lhéritier, Ecole de Biologie Industrielle, Cergy, France

This book deals with the formulation of industrial products. Its field of application ranges from the food-processing industry to the elastomer industry, showing that the principles of development always follow the same methodology.

### Contents

Part 1. General Information  
1. Introduction.  
2. Formulation in Major Organic Chemistry Industries.  
3. Solutions.  
4. Dispersions.  
5. Formulation of Emulsions.  

Part 2. Concept and Application  
1. Dosage Form and Pharmaceutical Development.  
2. Formulation of Cosmetic Products.  
3. Formulation of Food Products.  
4. Formulation of Elastomers.

## Self-Compacting Concrete

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2. Early Age Behavior.  
3. Mechanical Properties and Delayed Deformations.  
4. Durability of Self-Compacting Concrete.  
5. High Temperature Behavior of Self-Compacting Concretes.

## Multiscale Geomechanics

Edited by Pierre-Yves Hicher, Ecole Centrale de Nantes, France

The first part of the book examines the behavior of soils at the level of their different constituents and at the level of their interaction. The second part deals with soil mechanics from the vantage point of the construction project.

### Contents

1. Jean Biarez: His Life and Work.  
2. From Particle to Material Behavior: the Paths Chartered by Jean Biarez.  
5. Models by Jean Biarez for the Behavior of Clean Sands and Remolded Clays at Large Strains.  
6. The Concept of Effective Stress in Unsaturated Soils.  
This book provides an in-depth discussion of the aspects in the field of construction using organic materials.

Contents

Part 1. Problems Regarding Organic Materials and Sustainable Development
1. Organic materials used in Construction at the Dawn of the Third Millennium.
2. Sustainable Development Issues Regarding Organic Materials used in Civil Engineering.
3. Health Risks of Organic Materials used in Construction: What is the Situation Today?

Part 2. Organic Polymers as Building Materials
5. Organic Polymers.
6. Formulation of Plastics.
7. Ageing and Durability of Organic Polymers.

Part 3. Manufactured Products
12. Elastomers and Rubbers used in Civil Engineering.

15. Wood.

Part 5. Organic Binder-based Materials
16. Bitumen, Road Construction and Sustainable Development.
17. Industrial Mortars and Repairing Concrete Products.
19. Discrete Models Built-in into Cement Matrices
22. Adhesive Bonding, a Method for Construction.
23. Strengthening Concrete Structures by Externally Bonded Composite Materials.
24. Durability of FRP Strengthened Concrete Specimens under Accelerated Ageing.
27. Specific Contributions of Viscous Behavior Materials in Construction.
28. Organics in Construction – How Far?
29. Thoughts on the Futurology in Research and Development of Innovative Materials.
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<th>Title</th>
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<th>ISBN</th>
<th>Year</th>
<th>Pages</th>
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<td>Designing and Building with UHPFRC</td>
<td>Edited by François Toutlemonde, IFSTTAR, Paris and Jacques Resplendino, Direction Inter-départementale des Routes Méditerranée Marseille, France</td>
<td>9781848212718 • January 2011 • 848 pages • USD 310.00</td>
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<tr>
<td>Mechanics of Unsaturated Geomaterials</td>
<td>Edited by Lyesse Laloui, Swiss Federal Institute of Technology, Lausanne, Switzerland</td>
<td>9781848212664 • June 2010 • 400 pages • USD 165.00</td>
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<td>Soil Mechanics</td>
<td>Roberto Nova, Milan University of Technology, Italy</td>
<td>9781848211025 • June 2010 • 416 pages • USD 210.00</td>
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<td>Micromechanics of Failure in Granular Geomaterials</td>
<td>Edited by François Nicot, CEMAGREF, Grenoble, France and Richard Wan, University of Calgary, Alberta, Canada</td>
<td>9781848211285 • November 2009 • 368 pages • USD 165.00</td>
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<td>Environmental Geomechanics</td>
<td>Edited by Bernard Schrefler, University of Padua, Italy and Pierre Delage, Ecole Nationale des Ponts et Chaussées, Paris, France</td>
<td>978184821667 • June 2010 • 544 pages • USD 215.00</td>
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<td>Advances in Computed Tomography for Geomaterials • GeoX2010</td>
<td>Edited by Khalid A. Alshibli, Louisiana State University and Allen H. Reed, Naval Research Laboratory, Stennis Space Center, USA</td>
<td>9781848211797 • February 2010 • 448 pages • USD 230.00</td>
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<td>Mechanical Behavior of Concrete</td>
<td>Edited by Jean-Michel Torrenti, Ecole Nationale des Ponts et Chaussées, Jean-Marie Reynouard, INSA de Lyon and Gilles Pijaudier-Cabot, University of Pau and Pays de l'Adour, France</td>
<td>9781848211780 • March 2010 • 432 pages • USD 215.00</td>
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<td>Dynamic Behavior of Concrete and Seismic Engineering</td>
<td>Edited by Jacky Mazars, INPG, Grenoble and Alain Millard, CEA Saclay, France</td>
<td>9781848210714 • March 2009 • 400 pages • USD 180.00</td>
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<td>Seismic Engineering</td>
<td>Jacques Betbeder-Matibet</td>
<td>9781848210264 • February 2008 • 992 pages • USD 385.00</td>
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<td>Thermo-hydromechanical and Chemical Coupling in Geomaterials and Applications</td>
<td>Proceedings of the 3rd International Symposium GeoProc’2008 Edited by Jian-Fu Shao and Nicolas Burlion, Polytech-Lille, France</td>
<td>9781848210431 • May 2008 • 736 pages • USD 310.00</td>
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<td>Homogenization of Coupled Phenomena in Heterogenous Media</td>
<td>Jean-Louis Auriault and Christian Geindreau, Joseph Fourier University, Grenoble and Claude Boutin, ENTPE Lyon, France</td>
<td>9781905209507 • September 2005 • 656 pages • USD 250.00</td>
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<td>Constitutive Modeling of Soils and Rocks</td>
<td>Edited by Pierre-Yves Hicher, Ecole Centrale de Nantes and Jian-Fu Shao, University of Science and Technology, Lille, France</td>
<td>9781848210202 • April 2008 • 456 pages • USD 250.00</td>
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<td>Micromechanics of Granular Materials</td>
<td>Edited by Bernard Cambou, Ecole Centrale de Lyon, Michel Jean, LMA, Marseille and Farhang Radjai, University of Montpellier 2, France</td>
<td>9781848210752 • May 2009 • 368 pages • USD 160.00</td>
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<td>Multiscale Modeling of Heterogenous Materials</td>
<td>From Microstructure to Macro-scale Properties Edited by Oana Cazacu, University of Florida, Shalimar, FL, USA</td>
<td>9781848210479 • August 2008 • 368 pages • USD 165.00</td>
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Advances in X-ray Tomography for Geomaterials
Edited by Jacques Desrues, Gioacchino Viggiani and Pierre Bé suede, Grenoble, France
9781905209606 • September 2006 • 456 pages • USD 275.00

Microtunneling and Horizontal Drilling
RECOMMENDATIONS
French Society for Trenchless Technology (FSTT)
9781905209002 • February 2006 • 344 pages • USD 215.00

Organic Materials in Civil Engineering
Yves Mouton, Conservatoire National des Arts et Métiers, Paris, France
9781905209118 • May 2006 • 356 pages • USD 200.00

International Conference on Heavy Vehicles • HVParis2008
ICWIM5
Edited by Bernard Jacob, Eugene O’Brien, Alan O’Connor and Mohamed Bouteldja
9781848210592 • May 2008 • 616 pages • USD 250.00

HVTT10
Edited by Bernard Jacob, Paul Nordengen, Alan O’Connor and Mohamed Bouteldja
9781848210585 • May 2008 • 608 pages • USD 250.00
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## Scientific and Technical Topics

*(non-exhaustive list)*

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<td>Knowledge Engineering</td>
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<td>Data Mining</td>
<td>Knowledge Representations</td>
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## Forthcoming Titles

- Automatic Document Summarization by Torres-Moreno Juan-Manuel
- Comparable Corpora and Computer-assisted Translation by Delpech Estelle Maryline
- Design of the Learning Organization by Ben Chouikha Mona
- Deterministic and Non-deterministic Mechanisms by Vidal-Naquet Guy
- French Sign Language (LSF) by Braffort Annelies
- Games with a Purpose (GWAPS) by Lafourcade Mathieu, Joubert Alain, Le Brun Nathalie
- Lexical Data Acquisition using Games by Lafourcade Mathieu, Joubert Alain
- Logical Modeling of Biological Systems by Farinas del Cerro Luis, Inoue Katsumi
- Named Entities for Computational Linguistics by Nouvel Damien, Ehrmann Maud, Rosset Sophie
- Transfer and Management of Knowledge by Machado Carolina, Davim J. Paulo

## Forthcoming Sets

- Parsing coordinated by Joseph Mariani, Patrick Paroubek
Knowledge management (KM) is the process of finding, distributing, and using knowledge about an organization effectively in a multi-disciplined approach. Information Systems for Knowledge Management brings together leading authors in this field to discuss implementing KM through networks and information technology. Individual chapters cover various topics in the field, including assessing community maturity from a KM perspective; social networks; sociocultural KM in computer-supported collaborative learning; argumentation-based rough set theory and KM; using tacit knowledge in collaborative decision-making; information management in microblogs; KM systems in the legal domain; core ontologies; a multicriteria decision-making approach for business process evaluation; and a collaborative approach for knowledge codification, knowledge engineering methods and knowledge transfer.

Contents
1. Assessing the Community Maturity from a Knowledge Management Perspective.
2. Social Networks: Leveraging User Social Data to Empower Collective Intelligence.
3. Sociocultural Knowledge Management toward the Adaptation of a CSCL Environment.
4. An Argumentation-Based Rough Set Theory for Knowledge Management.
6 Relevant Information Management in Microblogs.
7. A Legal Knowledge Management System Based on Core Ontology.
10. A Collaborative Approach for Optimizing Continuity between Knowledge Codification with Knowledge Engineering Methods and Knowledge Transfer.

This book presents a theory of consciousness which is unique and sustainable in nature, based on physiological and cognitive-linguistic principles controlled by a number of socio-psycho-economic factors. In order to anchor this theory, which draws upon various disciplines, the author presents a number of different theories, all of which have been abundantly studied by scientists from both a theoretical and experimental standpoint, including models of social organization, ego theories, theories of the motivational system in psychology, theories of the motivational system in neurosciences, language modeling and computational modeling of motivation.

The theory presented in this book is based on the hypothesis that an individual’s main activities are developed by self-motivation, managed as an informational need. This is described in chapters covering self-motivation on a day-to-day basis, the notion of need, the hypothesis and control of cognitive self-motivation and a model of self-motivation which associates language and physiology. The subject of knowledge extraction is also covered, including the impact of self-motivation on written information, non-transversal and transversal text-mining techniques and the fields of interest of text mining.

Contents
2. Self-motivation on a Daily Basis.
3. The Notion of Need.
4. The Models of Social Organization.
5. Self Theories.
6. Theories of Motivation in Psychology.
7. Theories of Motivation in Neurosciences.
8. Language Modeling.
12. Impact of Self-Motivation on Written Information.
15. Fields of Interest for Text Mining.
Decision-making has evolved recently thanks to the introduction of information and communication technologies in many organizations, which has led to new kinds of decision-making processes, called "collaborative decision-making", at the organizational and cognitive levels.

This book looks at the development of the decision-making process in organizations. Decision-aiding and its paradigm of problem solving are defined, showing how decision-makers now need to work in a cooperative way.

Definitions of cooperation and associated concepts such as collaboration and coordination are given and a framework of cooperative decision support systems is presented, including intelligent DSS, cooperative knowledge-based systems, workflow, group support systems, collaborative engineering, integrating with a collaborative decision-making model in part or being part of global projects.

Several models and experimental studies are also included showing that these new processes have to be supported by new types of tools, several of which are described in order to calculate or simulate solutions or global solutions for decision-making modification.

Definitions and new trends for these models are given, along with types of systems.

Contents

3. The Need to Cooperate.
Qualitative reasoning besides its numerous applications (planning, robotics, natural language understanding, GIS, location-aware information systems), has many connections to theoretical fields such as algebra and topology. This book provides an introduction to the main directions of present day research (including less discussed aspects such as fuzzy reasoning or connections to model theory) with an emphasis on algebraic, topological and geometric aspects.

Contents
1. Allen’s Calculus.
2. Polynomial Subclasses of Allen’s Algebra.
4. Binary Qualitative Formalisms.
5. Qualitative Formalisms of Arity Greater than 2.
7. Fuzzy Reasoning.
8. The Geometrical Approach and Conceptual Spaces.
9. Weak Representations.
12. Complexity of Constraint Languages.
15. Conclusion and Prospects.

Competitive Intelligence 2.0
ORGANIZATION, INNOVATION AND TERRITORY
Edited by Luc Quoniam, University Paris 8, France

This book considers the implications of the changing paradigm for competitive, economic and territorial intelligence applied to innovation, value creation and enhancement of territories. Competitive intelligence is therefore in the “2.0” and its values: perpetual beta, user-generated content, social relations, etc., horizontality, a renewed legitimacy.

Contents
Part 1. Organization
3. Sustainable Development 2.0: Seeking for “The Creation of Shared Values”.
Part 2. Innovation
7. Competitive Intelligence 2.0 Tools.
10. Innovation, Serendipity 2.0, Filing Patents from Biomedical Literature Exploration.
12. Information Property and Liability in the 2.0?
Part 3. Territory
13. Territory and Organizational Reputation 2.0.
14. Triple Helix and Territorial Intelligence 2.0.
15. Regional Development 2.0.
16. Government Strategies of Territorial Intelligence 2.0: Support to SMEs-TPE.
17. University: Catalyst for the Implementation of Competitive Intelligence 2.0 in Africa (Case Study of Nigeria).

Emotion-oriented Systems
Edited by Catherine Pelachaud, CNRS, Telecom ParisTech, France

Emotion-oriented Systems covers various domains of research in emotion-oriented systems. It aims to highlight the importance of basing the computational model on theoretical foundations and on natural data.

Contents
Part 1. Foundations
2. Emotion and Brain.
Part 2. Non-Verbal Behavior
5. Acoustic Recognition of Emotions.
7. Perception and Recognition of Emotions.
Part 3. Functions
8. Role of Emotions in Human-Machine Interaction.
Part 4. Applications
10. Music And Emotions.
11. The Literary Sentiments in Interactive Narration.
12. Design of Emotions or How Digital Softens Us.

The Semantic Sphere 1
COMPUTATION, COGNITION AND INFORMATION ECONOMY
Pierre Lévy, University of Ottawa, Canada

This book contains a philosophical justification and scientific explanation of a computable metalanguage called Information Economy Meta Language (IEML).

Contents
1. General Introduction.
Part 1. The Philosophy of Information
6. The Information Economy.
Part 2. Modeling Cognition
7. Introduction to the Scientific Knowledge of the Mind.
8. The Computer Science Perspective: Toward a Reflexive Intelligence.
9. General Presentation of the IEML Semantic Sphere.
Semi-Supervised and Unsupervised Machine Learning

Novel Strategies
Amparo Albalate and Wolfgang Minker, University of Ulm, Institute of Information Technology, Germany

9781848212039 • December 2010 • 256 pages • USD 100.00

Digital Cognitive Technologies

Epistemology and Knowledge Society
Edited by Bernard Reber, CNRS-Paris Descartes University, and Claire Brossaud, Maison des Sciences de l’Homme, Paris, France

9781848210738 • April 2010 • 448 pages • USD 190.00

Sequential Decision-making Problems

Representation and Solution
Cédric Pralet, Gérard Verfaillie, ONERA and Thomas Schiex, INRA Toulouse, France

9781848211742 • November 2009 • 352 pages • USD 165.00

From Speech Physiology to Linguistic Phonetics
Alain Marchal, CNRS, University of Provence, France

9781848211131 • June 2009 • 240 pages • USD 110.00

Distance and E-learning in Transition

Learning Innovation, Technology and Social Challenges
Edited by András Szücs, Alan Tait, Martine Vidal and Ulrich Bernath, EDEN, Hungary

9781848211322 • June 2009 • 896 pages • USD 325.00

Decision-making Process

Concepts and Methods
Edited by Denis Bouyssou, University Paris 9, Didier Dubois and Henri Prade, Paul Sabatier University, Toulouse, France and Marc Pirlot, Polytech Mons, Belgium

9781848211162 • May 2009 • 912 pages • USD 215.00

Spoken Language Processing
Edited by Joseph Mariani, LIMSI-CNRS, Paris-Sud University, France

9781848210318 • December 2008 • 504 pages • USD 220.00

ISTE catalog May 2014

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Scientific and Technical Topics
(non-exhaustive list)

Agent-oriented Programming
Artificial Intelligence
Computational Biology
Computer Security and Formal Verification
Constraint Programming
Data Management
High Performance Computing
Image Processing
Knowledge Engineering
Multimedia
Object Technologies
Operations Research
Programming Languages
Software Engineering
Theoretical Computer Science

Forthcoming Titles and Sets
Forthcoming Titles

Abstract Domains in Constraint Programming by Pelleau Marie
Advanced Graph Theory and Combinatorics by Rigo Michel
Artificial Intelligence for Building Energy Analysis by Magoules Frédéric, Zhao Hai-Xiang
B Method by Boulanger Jean-Louis
Certifiable Software Applications by Boulanger Jean-Louis
ControlBuild Implementation by Boulanger Jean-Louis
Data Quality in Practices by Berti-Equille Laure
Data Validation by Boulanger Jean-Louis
Floating-point Algorithms and Formal Proofs by Boldo Sylvie, Melquiond Guillaume
Formal Languages, Automata and Numeration Systems by Rigo Michel
Formal Methods Applied to Complex Systems by Boulanger Jean-Louis
Formal Methods Applied to Industrial Complex Systems by Boulanger Jean-Louis
Graph-related Optimization and Decision Theory by Krichen Saoussen, Chaouachi Jouhaina
Intensive Calculation for Engineering by Magoules Frédéric
Mathematical Programming Solver based on Local Search by Gardi Frédéric, Benoist Thierry, Darlay Julien, Estellon Bertrand, Megel Romain
Microsoft PRISM by Nassar Tawfik
Mined Individuals in Large Networks by Prieur Christophe
Musical Rhetoric by Saint-Dizier Patrick
Parallel Computing by Magoules Frédéric, Roux François-Xavier, Houzeaux Guillaume
Performance Evaluation by Simulation and Analysis with Applications to Computer Networks by Chen Ken
Rapid Prototyping Software for Avionics Systems by Larrieu Nicolas, Varet Antoine
Safety of Software-based Systems by Boulanger Jean-Louis
SCADE / Language and Applications by Boulanger Jean-Louis, Fornari François-Xavier, Camus Jean-Louis, Dion Bernard
Scheduling of Large-scale Virtualized Infrastructures by Quesnel Flavien
Visual Inspection Technology in the Hard Disc Drive Industry by Muneesawang Paisarn, Yammen Suchart

Forthcoming Sets

- Constraint Programming coordinated by Narendra Jussien and Håkan Kjellerstrand
Over the past 20 years, software architectures have significantly contributed to the development of complex and distributed systems. Nowadays, it is recognized that one of the critical problems in the design and development of any complex software system is its architecture, i.e. the organization of its architectural elements. Software Architecture 1 presents the software architecture paradigms based on objects, components, services and models, as well as the various architectural techniques and methods, the analysis of architectural qualities, models of representation of architectural templates and styles, their formalization, validation and testing and finally the engineering approach in which these consistent and autonomous elements can be tackled.

**Contents**

1. Object-Oriented, Component-Based, Agent-Oriented and Service-Oriented Paradigms in Software Architectures.
2. Reference Architectures.
5. Software Architecture for Product Lines.

This book presents the software architecture paradigms based on objects, components, services and models, as well as the various architectural techniques and methods, the analysis of architectural qualities, models of representation of architectural templates and styles, their formalization, validation and testing and finally the engineering approach in which these consistent and autonomous elements can be tackled.

**Contents**

1. Metamodeling in Software Architectures.
3. Software Architectures and Multiple Variability.
5. Software Architectures and Multiagent Systems.

Time-Predictable Architectures is concerned with building computers that can be used to design embedded real-time systems. Real-time embedded software requires increasing higher performances, which leads the authors to consider processors that implement advanced mechanisms such as pipelining, out-of-order execution, branch prediction, cache memories, multithreading, multicores, architectures, etc. The authors investigate the time-predictability of such schemes. This book mainly deals with hard real-time systems where it is expected that no failure occurs during the time that the system is effective (often referred to as the time of the mission in reference to aeronautics and space systems).

**Contents**

4. Memory Hierarchy.
5. Multicores.
6. Example Architectures.
The distributed constraint satisfaction problem has such properties. The process is more adequate to model and solve such kinds of problems. Therefore, a distributed model allowing a decentralized solving distribution is mainly due to privacy and/or security requirements. Geographically distributed among physical distributed agents. This distributed nature. In this type of application, the knowledge about several applications in multi-agent coordination that are of a constraint satisfaction problem paradigm. However, there are several applications in multi-agent coordination that are of a distributed nature. In this type of application, the knowledge about the problem, that is, variables and constraints, may be logically or geographically distributed among physical distributed agents. This distribution is mainly due to privacy and/or security requirements. Therefore, a distributed model allowing a decentralized solving process is more adequate to model and solve such kinds of problem. The distributed constraint satisfaction problem has such properties.

## Contents

1. Introduction.  
   Part 1. Optimization and Artificial Evolution  
Part 2. Applications to Air Traffic Control  
5. Air Traffic Control.  
6. Contributions to Airspace Sectorization.  
7. Contribution to Traffic Assignment.  
9. Conclusion and Future Perspectives.

## Algorithms and Ordering Heuristics for Distributed Constraint Satisfaction Problems

Mohamed Wahbi, Ecole des Mines de Nantes, France  
June 2013 • 176 pages • USD 75.00  
ISBN: 9781848215948 • Title co-published with Wiley

A wide variety of problems in artificial intelligence are solved using the constraint satisfaction problem paradigm. However, there are several applications in multi-agent coordination that are of a distributed nature. In this type of application, the knowledge about the problem, that is, variables and constraints, may be logically or geographically distributed among physical distributed agents. This distribution is mainly due to privacy and/or security requirements. Therefore, a distributed model allowing a decentralized solving process is more adequate to model and solve such kinds of problem. The distributed constraint satisfaction problem has such properties.

## Contents

Part 1. Background on Centralized and Distributed Constraint Reasoning  
1. Constraint Satisfaction Problems.  
2. Distributed Constraint Satisfaction Problems.  
Part 2. Synchronous Search Algorithms for DisCSPs  
3. Nogood Based Asynchronous Forward Checking (AFC-ng).  
4. Asynchronous Forward Checking Tree (AFC-tree).  
Part 3. Asynchronous Search Algorithms and Ordering Heuristics for DisCSPs  
6. Corrigendum to “Min-domain Retroactive Ordering for Asynchronous Backtracking”.  
Part 4. DisChoco 2.0: A Platform for Distributed Constraint Reasoning  
8. DisChoco 2.0.  
9. Conclusion.
The goals of LMF are to provide a common model for the creation and use of lexical resources, to manage the exchange of data between and among these resources, and to enable the merging of a large number of individual electronic resources to form extensive global electronic resources.

The LMF specification is now a success and numerous lexicon managers currently use LMF in different languages and contexts.

Contents

1. LMF – Historical Context and Perspectives.
2. Model Description.
3. LMF and the Data Category Registry: Principles and Application.
6. LMF for Arabic.
7. LMF for a Selection of African Languages.
8. LMF and its Implementation in Some Asian Languages.
14. LMF as a Foundation for Servicized Lexical Resources.
15. Creating a Serialization of LMF: The Experience of the RELISH Project.

The Inverse Method

PARAMETRIC VERIFICATION OF REAL-TIME EMBEDDED SYSTEMS
Etienne André, University Paris 13 and Romain Soulat, ENS Cachan, France

This book introduces state-of-the-art verification techniques for real-time embedded systems, based on the inverse method for parametric timed automata.

Contents

1. Parametric Timed Automata.
2. The Inverse Method for Parametric Timed Automata.
3. The Inverse Method in Practice: Application to Case Studies.
5. Parameter Synthesis for Hybrid Automata.
6. Application to the Robustness Analysis of Scheduling Problems.
7. Conclusion and Perspectives.
In the design of embedded systems, memory allocation and data assignment are among the main challenges that electronic designers have to face. A state of the art of optimization techniques for memory management and data assignment is presented in this book.

**Content**

2. Unconstrained Memory Allocation Problem.
3. Memory Allocation Problem with Constraint on the Number of Memory Banks.
4. General Memory Allocation Problem.
5. Dynamic Memory Allocation Problem.
7. General Conclusions and Future Work.
This book is based on the experience of people who are currently involved in the creation and evaluation of safety critical system software.

**Contents**

1. SPARK – A Language and Tool-Set for High-Integrity Software Development.
4. Polyspace®.
5. Escher Verification Studio Perfect Developer and Escher C Verifier.
8. Conclusion.

**Model-Driven and Software Product Line Engineering**

Hugo Arboleda, ICESI University, Cali, Colombia and Jean-Claude Royer, Ecole des Mines de Nantes, France

Many approaches to creating Software Product Lines have emerged that are based on Model-Driven Engineering. This book introduces both Software Product Lines and Model-Driven Engineering, which have separate success stories in industry, and focuses on the practical combination of them. It describes the challenges and benefits of merging these two software development trends and provides the reader with a novel approach and practical mechanisms to improve software development productivity.

The book is aimed at engineers and students who wish to understand and apply software product lines and model-driven engineering in their activities today. The concepts and methods are illustrated with two product line examples: the classic smart-home systems and a collection manager information system.

**Contents**

1. Introduction.
3. Model-Driven Engineering.
7. A Second Comprehensive Application Example.
8. Further Reading.
9. Conclusion.

**Assembly Language Programming**

ARM Cortex-M3

Vincent Mahout, LAAS-INSA, France

ARM designs the cores of microcontrollers which equip most “embedded systems” based on 32-bit processors. Cortex-M3 is one of these designs, recently developed by ARM with microcontroller applications in mind. This book explains the basics of programming in an assembly language, while being based on the architecture of Cortex-M3 in detail and developing many examples.

**Contents**

2. The Core of Cortex-M3.
3. The Proper Use of Assembly Directives.
4. Operands of Instructions.
5. Instruction Set.
6. Algorithmic and Data Structures.
7. Internal Modularity.
Appendix A. Instruction Set – Alphabetic List.
Appendix B. The SysTick Timer.
Appendix C. Example of a “Bootstrap” File.
Appendix D. The GNU Assembler.
This book describes the graph partitioning problem by presenting both methodological and applied chapters. There are three parts to the book: the first part presents graph partitioning for numerical applications, the second part presents the optimization view of graph partitioning, and the third part presents other aspects of graph partitioning.

Including new test graphs and test data, this is the first book that really focuses on the graph partitioning optimization problem both theoretically and with its main applications.

Contents

1. General Introduction to Graph Partitioning.
   Part 1. Graph Partitioning for Numerical Analysis
   2. Hypergraph Partitioning.
   3. Parallelization of Graph Partitioning.
   Part 2. Optimization Methods for Graph Partitioning
   5. Local Metaheuristics and Graph Partitioning.
   6. Population Based Metaheuristics, Fusion-Fission and Graph Partitioning Optimization.
   7. Partitioning Mobile Networks into Tariff Zones.
   8. Air Traffic Control Graph Partitioning Application.
   Part 3. Other Approaches to Graph Partitioning
   9. Application of Graph Partitioning to Image Segmentation.
   10. Distances in Graph Partitioning.
   11. Deletion of Disjoint or Overlapping Communities in Networks.

This book focuses on constraint satisfaction problems related to tree partitioning problems enriched by several additional constraints that restrict the possible partitions topology.

Contents

Part 1. Constraint Programming and Foundations of Graph Theory
   1. Introduction to Constraint Programming.
   2. Graph Theory and Constraint Programming.
   3. Tree Graph Partitioning.
   Part 2. Characterization of Tree-based Graph Partitioning Constraints
   4. Tree Constraints in Undirected Graphs.
   5. Tree Constraints in Directed Graphs.
   6. Additional Constraints Linked to Graph Partitioning.
   7. The Case of Disjoint Paths.
   8. Implementation of a Tree Constraint.
   Part 3. Implementation: Task Planning
   10. Advanced Model in Constraint Programming.
   11. Conclusion.
   12. Perspectives and Criticisms.
COMPUTER ENGINEERING

Distributed Systems
DESIGN AND ALGORITHMS
Edited by Serge Haddad, ENS Cachan, Fabrice Kordon, UPMC, Paris, Laurent Pautet, Telecom ParisTech and Laure Petrucci, University Paris 13, France
June 2011 • 336 pages • USD 147.00
ISBN: 9781848212503 • Title co-published with Wiley

Contents
1. Introduction.
Part 1. Large Scale Peer-to-Peer Distributed Systems
2. Introduction to Large-Scale Peer-to-Peer Distributed Systems.
3. Design Principles of Large-Scale Distributed System.
4. Peer-to-Peer Storage.
5. Large-Scale Peer-to-Peer Game Applications.
Part 2. Distributed, Embedded and Real-Time Systems
6. Introduction to Distributed Embedded and Real-Time Systems.
7. Scheduling in Distributed Real-Time Systems.
Part 3. Security in Distributed Systems

Computing Networks
FROM CLUSTER TO CLOUD COMPUTING
Pascale Vicat-Blanc, Sébastien Soudan and Romaric Guillier, LATISS, Lyon and Brice Goglin, INRIA, Bordeaux, France
May 2011 • 272 pages • USD 96.00
ISBN: 9781848212862 • Title co-published with Wiley

This book gives the key points to help network designers, distributed-application developers and users to better understand the technologies, specifics, constraints and benefits of these different infrastructures' communication systems.

Contents
1. From Multiprocessor Computers to Clouds.
5. The Challenge of Throughput and Distance.
7. Optical Technology and Grids.
8. Bandwidth on Demand.

Models and Analysis in Distributed Systems
Edited by Serge Haddad, Fabrice Kordon, Laurent Pautet, and Laure Petrucci
June 2011 • 368 pages • USD 147.00
ISBN: 9781848213142 • Title co-published with Wiley

This book describes the state of the art of the formal methods for the analysis of distributed systems.

Contents
1. Introduction.
Part 1. Formal Models for Distributed Systems
2. Introduction to Formal Models.
5. Architecture Description Languages.
Part 2. Verification Techniques for Distributed Systems
6. Introduction to Verification.
8. Verification of Infinite-State Systems.
9. Verification of Timed Systems.
10. Distributed Control.

Constraint Programming in Music
Edited by Charlotte Truchet, University of Nantes and Gérard Assayag, IRCAM-CNRS, France
May 2011 • 256 pages • USD 96.00
ISBN: 9781848212886 • Title co-published with Wiley

Constraint Programming (CP) is a declarative programming paradigm with many academics and industrial applications (from the n-queens to planning, vehicle routing, etc.). This book is a state of the art with contributions both from scientists and musicians.

Contents
1. Modeling Temporal Constraints for a System of Interactive Scores.
3. Constraints for an Unfolding Time.
4. Global Constraints in Orchestration.
5. Using Gecode to Solve Musical Constraint Problems.
8. OMClouds, a Library for Musical Constraints.

Fundamentals of Software Testing
Bernard Homès, Consultant, France
December 2011 • 384 pages • USD 147.00
ISBN: 9781848213241 • Title co-published with Wiley

The fundamental aspects of testing are approached, as is testing in the lifecycles from Waterfall to Agile and iterative lifecycles.

Contents
2. Testing Throughout the Software Life Cycle.
4. Test Design Techniques (FL 4.0).
5. Test Management (FL 5.0).
7. Mock Exam.
8. Templates and Models.
9. Answers to the Questions.
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<th>Editors/Authors</th>
<th>ISBN</th>
<th>Year</th>
<th>Pages</th>
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<td>Artificial Ants</td>
<td>Edited by Nicolas Monmarché, University of Tours, Frédéric Guinand, University of Le Havre and Patrick Siarry, University Paris 12, France</td>
<td>9781848211940</td>
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<td>Christine Solnon, University Lyon 1, France</td>
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<td>256</td>
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Trends in Constraint Programming
Edited by Frédéric Benhamou, University of Nantes, Narendra Jussien, Ecole des Mines, Nantes, France, and Barry O’Sullivan, University College Cork, Ireland

Probabilistic Combinatorial Optimization on Graphs
Cécile Murat and Vangelis Th. Paschos, University Paris-Dauphine, France

From MDD Concepts to Experiments and Illustrations
Edited by Jean-Philippe Babau, INSA Lyon, Joël Champeau, ENSIETA, Brest and Sébastien Gérard, CEA, France

Model Driven Engineering for Distributed Real-time Embedded Systems
Edited by Sébastien Gérard, CEA, Jean-Philippe Babau, INSA Lyon and Joël Champeau, ENSIETA, France

A to Z of Sudoku
THE SCIENCE OF CONSTRAINT PROGRAMMING BEHIND SUDOKU…
Narendra Jussien, Ecole des Mines, Nantes, France

Software Specification Methods
AN OVERVIEW USING A CASE STUDY
Edited by Henri Habrias, University of Nantes, France and Marc Frappier, University of Sherbrooke, Canada

Interoperability for Enterprise Software and Applications 2006
Edited by Hervé Panetto, University Henri Poincaré Nancy I, Research Centre for Automatic Control, Nacer Boudjlida, University Henri Poincaré Nancy, France

Interoperability of Enterprise Software and Applications 2005
Edited by Hervé Panetto, University Henri Poincaré Nancy I
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(non-exhaustive list)

Adaptive and Learning Systems
Applications of Control
Control Design
Control Engineering
Control Theory
Discrete Events and Hybrid Systems
Distributed Parameter Systems
Enterprise Information Technology
Fault Detection
Inverse Manufacturing
Large Scale Complex Systems
Linear and Non-Linear Control
Systems
Logistics and Supply Chains
Networked Systems
Operations Management
Optimal Control
Production Engineering
Project Management
Robust Control
Services and Products Engineering
Stochastic Systems
Supervision and Fault Tolerant Systems
Systems Modeling and Identification
Waste Management

Forthcoming Titles

CENELEC 50128 and IEC 62279 Standards by Boulanger Jean-Louis
Designing Human-machine Cooperation Systems by Millot Patrick
Discrete Time Switched Linear Systems by Daafouz Jamal, Millerioux Gilles
Diversity and Fractional Differentiation for System Dynamics by Oustaloup Alain
Haptic Feedback Teleoperation of Optical Tweezers by Ni Zhenjiang et al.
Integrating Systems of Systems Engineering and System Safety by Hakola Katri
Interface Management by Davies Paul
Model Based Systems Engineering by Micouin Patrice
Modeling Approaches and Simulation Optimization of Supply Chain Management by Riaou Fouad
Optimization in Engineering Sciences by Borne Pierre et al.
Risk Management in Life Critical Systems by Millot Patrick
Supply Chain Performance and Evaluation Models by Estampe Dominique
Urban Logistics by Delaître Loïc

ISTE catalog May 2014
In Introduction to Sustainable Transports, Bernard Favre presents the fundamental issues concerning the future of clean transport systems. Discussing technological innovations, transport infrastructure, and human and social factors, this book encourages the reader to view transport systems in terms of their overall structure, emphasizing the potential conflict between individual and collective objectives, and short- and long-term ones.

This book presents the elements in context and puts forward tools. However, it also warns against reading the subject of sustainable transport in too linear a fashion. Interactions of cause and effect, the interlocking of the domains and disciplines concerned, the consideration of distance and time scales, the diversity of geographical and cultural territories — everything demonstrates the complexity of the possible answer — or answers.

Contents

1. The Fundamentals of Sustainable Transport.
4. Can We Organize Sustainable Mobility?

Appendix. LUTB Transport and Mobility Systems.

This book presents a collection of examples illustrating the state of the art and research developments in the machinability of advanced materials. Chapter 1 presents the concept of machinability. Chapter 2 covers milling burr formation and avoidance. Chapter 3 contains information on the machinability of titanium and its alloys. Chapter 4 is dedicated to the effects of alloying elements on the machinability of near-eutectic Al-Si casting alloys. Chapter 5 covers the machinability of hard materials. Finally, in Chapter 6, an investigation on ductile regime machining of silicon nitride ceramics is presented.

Contents

6. An Investigation of Ductile Regime Machining of Silicon Nitride Ceramics.

An overview of the methods used for risk analysis in a variety of industrial sectors, with a particular focus on the consideration of human aspects, this book provides a definition of all the fundamental notions associated with risks and risk management, as well as clearly placing the discipline of risk analysis within the broader context of risk management processes.

The author begins by presenting a certain number of basic concepts, followed by the general principle of risk analysis. He then moves on to examine the ISO31000 standard, which provides a specification for the implementation of a risk management approach. The ability to represent the information we use is crucial, so the representation of knowledge, covering both information concerning the risk occurrence mechanism and details of the system under scrutiny, is also considered. The different analysis methods are then presented, firstly for the identification of risks, then for their analysis in terms of cause and effect, and finally for the implementation of safety measures.

Concrete examples are given throughout the book and the methodology and method can be applied to various fields (industry, health, organization, technical systems).

Contents

Part 1. General Concepts and Principles
1. Introduction.
2. Basic Notions.

Part 2. Knowledge Representation

Part 3. Risk Analysis Method
10. Deviation Analysis Using the HAZOP Method.
12. Fault Tree Analysis.
13. Event Tree and Bow-Tie Diagram Analysis.
15. Barrier Analysis and Layer of Protection Analysis.

Part 4. Appendices
Appendix 2. Causal Tree Analysis.
Appendix 4. Useful Notions in Reliability Theory.
Appendix 5. Data Sources for Reliability.
Appendix 8. XRisk Software.
In the field of aeronautical dynamics, this book offers readers a design tool which enables them to solve the different problems that can occur during the planning stage of a private project. The authors present a system for the modeling, design and calculation of the flying qualities of airplanes and drones, with a complete mathematical model by Matlab/Simulink.

Contents
1. 0D Analytical Modeling of the Airplane Motions.
3. Organization of the Auto-Pilot.

Nonlinear Physical Systems
SPECTRAL ANALYSIS, STABILITY AND BIFURCATIONS
Edited by Oleg N. Kirillov, Helmholtz-Zentrum Dresden-Rossendorf, Germany and Dmitry E. Pelinovsky, McMaster University, Canada
November 2013 • 448 pages • USD 180.00
ISBN: 9781848214200 • Title co-published with Wiley

Bringing together 18 chapters written by leading experts in dynamical systems, operator theory, partial differential equations, and solid and fluid mechanics, this book presents state-of-the-art approaches to a wide spectrum of new and challenging stability problems.

Contents
2. WKBJ Solutions Near an Unstable Equilibrium and Applications.
5. Tunneling, Librations and Normal Forms in a Quantum Double Well with a Magnetic Field.
9. Index Theorems for Polynomial Pencils.
12. Continuum Hamiltonian Hopf Bifurcation I.
13. Continuum Hamiltonian Hopf Bifurcation II.
15. Accurate Estimates for the Exponential Decay of Semigroups with Non-Self-Adjoint Generators.

Modeling of Complex Systems
APPLICATION TO AERONAUTICAL DYNAMICS
Emmanuel Grunn and Anh-Tuan Pham, ESTACA, Paris, France
October 2013 • 128 pages • USD 70.00
ISBN: 9781848214484 • Title co-published with Wiley

This book discusses management and engineering innovation with particular emphasis on human resource management (HRM) and production engineering.

Contents
1. We the Engineers and Them the Managers.
5. Struggling for Survival and Success: Can Brazil’s Defense Industry Help Foster Innovation?

Zonotopes
FROM GUARANTEED STATE-ESTIMATION TO CONTROL
Vu Tuan Hieu Le, IRSEEM/ESIGELEC, Cristina Stobia, Supélec, France, Teodoro Alamo and Eduardo F. Camacho, University of Seville, Spain and Didier Dumur, Supélec, France.
October 2013 • 176 pages • USD 85.00
ISBN: 9781848215894 • Title co-published with Wiley

This title focuses on two significant problems in the field of automatic control, in particular state estimation and robust Model Predictive Control under input and state constraints, bounded disturbances and measurement noises.

The authors build upon previous results concerning zonotopic set-membership state estimation and output feedback tube-based Model Predictive Control. Various existing zonotopic set-membership estimation methods are investigated and their advantages and drawbacks are discussed, making this book suitable both for researchers working in automatic control and industrial partners interested in applying the proposed techniques to real systems.

Contents
1. Uncertainty Representation Based on Set Theory.
2. Several Approaches on Zonotopic Guaranteed Set-Membership Estimation.
4. Tube Model Predictive Control Based on Zonotopic Set-Membership Estimation.

Management and Engineering Innovation
Edited by Carolina Machado, University of Minho and J. Paulo Davim, University of Aveiro, Portugal
May 2013 • 272 pages • USD 115.00
ISBN: 9781848215542 • Title co-published with Wiley

 contents | 39 |
Command-control for Real-time Systems
Mohammed Chadli, University of Picardy Jules Verne, Amiens and Hervé Coppier, ESIEE Amiens, France
April 2013 • 384 pages • USD 145.00
ISBN: 9781848214188 • Title co-published with Wiley

This book presents the calculation of correction for industrial systems as well as the possibility of coordinating with the current public transport system and the authors clearly illustrate this coordination within the framework of an intelligent transport system.
Each chapter of this title can be broken down into an approach for solving a transport problem in 3 stages, i.e. modeling the problem, creating optimization algorithms and validating the solutions.

Contents
1. Dynamic Car-pooling.
4. Solving the Problem of Dynamic Routes by Particle Swarm.
5. Optimization of Traffic at a Railway Junction: Scheduling Approaches Based on Timed Petri Nets.

Metaheuristic Optimization for the Design of Automatic Control Laws
Guillaume Sandou, Supélec, Gif Sur Yvette, France
August 2013 • 144 pages • USD 70.00
ISBN: 9781848215900 • Title co-published with Wiley

This book presents a new trend in Automatic Control with the use of metaheuristic algorithms. These kinds of algorithm can optimize any criterion and constraint, and therefore do not need such simplifications and reformulations.

Contents
1. Introduction and Motivations.
2. Symbolic Regression.
3. PID Design Using Particle Swarm Optimization.
4. Tuning and Optimization of H-infinity Control Laws.
5. Predictive Control of Hybrid Systems.

Driving Simulation
Hichem Arioui and Lamri Nehaoua, University of Evry-Val-d’Essonne, France
October 2013 • 160 pages • USD 80.00
ISBN: 9781848214675 • Title co-published with Wiley

The authors present a state of the art on safety systems and assistance for driving both motor vehicles and their two-wheeled counterparts. The main components constituting a driving simulator are described, followed by a classification of robotic architectures.
The aim of the book is to highlight the different perspectives between motor vehicles and motorcycles in order to identify relevant indicators that will help in the choosing of the mechanical architecture of the motorcycle simulator and its appropriate controls.

Contents
1. Driving Simulation.
3. Dynamics of Two-Wheeled Vehicles.

Reverse Engineering in Control Design
Daniel Alazard, Aeronautics and Space Institute (ISAE), Toulouse, France
February 2013 • 192 pages • USD 95.00
ISBN: 9781848215238 • Title co-published with Wiley

This title proposes practical approaches to building a standard H-infinity problem taking into account an initial controller. Such approaches allow us to mix various control objectives and to initialize procedures for a fixed-structure controller design.

Contents
1. Observer-based Realization of a Given Controller.
2. Cross Standard Form and Reverse Engineering.
This book describes the potentialities of metaheuristics for solving production scheduling problems and the relationship between these two fields.

The first part of the book presents eight applications of metaheuristics for solving various mono-objective scheduling problems.

The second part is itself split into two, the first section being devoted to five multi-objective problems to which metaheuristics are adapted, while the second tackles various transportation problems related to the organization of production systems.

Many real-world applications are presented by the authors, making this an invaluable resource for researchers and students in engineering, economics, mathematics and computer science.

Contents

7. Models and Methods in Graph Coloring for Various Production Problems.
8. Mathematical Programming and Heuristics for Scheduling Problems with Early and Tardy Penalties.
15. Combination of a Metaheuristic and a Simulation Model for the Scheduling of Resource-Constrained Transport Activities.
17. Metaheuristics for Job Shop Scheduling with Transportation.
**Hybrid Systems with Constraints**
Jamal Daafouz, University of Lorraine, Sophie Tarbouriech, LAAS CNRS, Toulouse and Mario Sigalotti, INRIA Palaiseau, France

Control theory is the main subject of this title, in particular analysis and control design for hybrid dynamic systems.

This book is dedicated mainly to hybrid systems with constraints; taking constraints into account in a dynamic system description has always been a critical issue in control. New tools are provided here for stability analysis and control design for hybrid systems with operating constraints and performance specifications.

**Contents**
4. Stabilization of Persistently Excited Linear Systems.
5. Hybrid Coordination of Flow Networks.
7. Exponential Stability for Hybrid Systems with Saturations.
8. Reference Mirroring for Control with Impacts.

---

**Loop-shaping Robust Control**
Philippe Feyel, Sagem Defense and Security, Safran group, France

This book gives an introduction to the loop-shaping approach before going on to show how it is possible to fully integrate this approach for the calculus of robust and performant controllers using pre-existing techniques already proven in industry, such as H∞ synthesis.

**Contents**
1. The Loop-shaping Approach.
2. Loop-shaping H-infinity Synthesis.
3. Two Degrees-of-Freedom Controllers.
4. Extensions and Optimizations.

---

**Competitive Quality Strategies**
Pierre Maillard, Consultant, France

This book presents new methodological principles that help leaders of businesses of all sizes to use, in the most effective way, the quality of their valuable production to enhance their competitiveness.

The concepts and models of principles of actions presented result from over 20 years of observation by the author of the way in which companies of all sizes and in all sectors attempt to use specific mechanisms of quality production in exchanges with their stakeholders, to give rise to long-lasting competitive factors.

The author has drawn up practical guides that are general enough for any company to be able to better understand and strengthen (often implicit) approaches to create new competitive edges, based on their employees’ culture of quality.

The new tools presented in this book, which have been tested in several companies, provide an answer to the need to boost growth in industrialized countries.

**Contents**
2. The Definition of a Competitive Quality Tactic.
5. Selling a Competitive Quality Tactic.

---

**Set-theoretic Fault-tolerant Control in Multisensor Systems**
Florin Stoican, IEEE, Romania and Sorin Olaru, Supélec, Gif-sur-Yvette, France

The authors propose a systematic analysis of the set theoretic elements and devise approaches which exploit advanced elements within the field.

**Contents**
2. Fault Detection and Isolation in Multisensor Systems.
5. Related Problems and Applications.

---

**Sustainable Supply Chain Management**
Joëlle Morana, University of Lyon, France

This book presents each economic, environmental and societal aspect of SuSCM. By considering each of these dimensions separately, the primary objective is to facilitate the implementation of the elements that make it up.

**Contents**
1. The Economic Aspect of SuSCM.
2. The Environmental Aspect of SuSCM.
3. The Social/Societal Aspect of SuSCM.
4. Sustainable Supply Chain Management Balanced Scorecard.
This book provides the latest models, methods and guidelines for networked enterprises to enhance their competitiveness and move towards innovative high performance and agile industrial systems.

Contents

1. Mass Customization as an Enabler of Network Resilience.
5. Performance Management.
10. Assessment of the Impact of Missing Delivery Reliability.
15. Performance Measurement.
17. Extended Business Processes Execution.
18. Standardization in IT-Based Procurement in Non-hierarchical Networks.

Multiple Models Approach in Automation

TAKAGI-SUGENO FUZZY SYSTEMS
Mohammed Chadli, University of Picardy Jules Verne, Amiens and Pierre Borne, Ecole Centrale de Lille, France
November 2012 • 208 pages • USD 95.00
ISBN: 9781848214125 • Title co-published with Wiley

This book concentrates on the analysis of the stability and synthesis of control laws and observations for multiple models. The authors’ approach is essentially based on Lyapunov's second method and LMI formulation. Uncertain multiple models with unknown inputs are studied and quadratic and non-quadratic Lyapunov functions are also considered.

Contents

1. Multiple Model Representation.
2. Stability of Continuous Multiple Models.
3. Multiple Model State Estimation.
4. Stabilization of Multiple Models.
5. Robust Stabilization of Multiple Models.

Vehicle Dynamics Estimation using Kalman Filtering

Moustapha Doumiati, Ali Charara, Alessandro Victorino and Daniel Lechner
November 2012 • 272 pages • USD 125.00
ISBN: 9781848213661 • Title co-published with Wiley

This book presents several model-based estimation methods which involve information from current potential-integrable sensors. Improving vehicle control and stabilization is possible when vehicle dynamic variables are known. The fundamental problem is that some essential variables related to tire/road friction are difficult to measure because of technical and economical reasons. Therefore, these data must be estimated.

It is against this background, that this book’s objective is to develop estimators in order to estimate the vehicle’s load transfer, the sideslip angle, and the vertical and lateral tire/road forces using a roll model. The proposed estimation processes are based on the state observer (Kalman filtering) theory and the dynamic response of a vehicle instrumented with standard sensors. These estimators are able to work in real time in normal and critical driving situations. Performances are tested using an experimental car in real driving situations. This is exactly the focus of this book, providing students, technicians and engineers from the automobile field with a theoretical basis and some practical algorithms useful for estimating vehicle dynamics in real-time during vehicle motion.

Contents

1. Modeling of Tire and Vehicle Dynamics.
2. Estimation Methods Based on Kalman Filtering.
Optimization of Logistics

Alice Yalaoui, Hicham Chehade, Farouk Yalaoui and Lionel Amodeo, University of Technology of Troyes, France

This book summarizes the evaluation and optimization methods used to solve the most frequent logistic systems optimization problems and techniques. In particular, the authors also emphasize some recent scientific developments, as well as presenting some industrial applications and some solved instances from real-life cases.

Performance evaluation tools (Petri nets, the Markov process, discrete event simulation, etc.) and optimization techniques (branch-and-bound, dynamic programming, genetic algorithms, ant colony optimization, etc.) are presented first.

New optimization methods are presented to solve systems design problems, layout problems and buffer-sizing optimization. Forecasting methods, inventory optimization, packing problems, lot-sizing quality management and scheduling are presented with examples in the final chapters.

Contents
2. Optimization.
3. Design and Layout.
4. Tactical Optimization.
5. Scheduling.
The objective of this book is to supply an educational tool for engineering schools, as well as a management tool for the efficient implementation of the reverse logistics function. It brings together the knowledge acquired by the scientific community. Even if reverse logistics has been the subject of several books over the past few years, very few theories have been developed and the subject is far from being exhausted. This book proposes generic concepts and processes that can be adapted to all businesses producing goods and services and which aim to integrate reverse logistics. These processes will enable us to shed light on their complexity and to take into account all the important variables.

Contents
1. Logistics Challenge.
2. Reverse Logistics Engineering.
3. Ecodesign.
4. Value Loops.

Mechatronics has today a significant and increasing impact on engineering with the design, development and operation of engineering systems.

Contents
1. Mechatronics Systems Based on CAD/CAM.
2. Modeling and Control of Ionic Polymer-Metal Composite Actuators for Mechatronics Applications.
4. Robust Control of Atomic Force Microscopy.
5. Automated Identification.
6. An Active Orthosis for Gait Rehabilitation.
7. Intelligent Assistive Knee Exoskeleton.

This book presents a collection of examples illustrating the state of the art and research developments to lasers in manufacturing.

Contents
2. Lasers in Metal Forming Applications.
3. Laser Forming of Metal Foams.
5. Laser Cutting a Small Diameter Hole: Thermal Stress Analysis.
This book presents correct-by-design control techniques for switching systems, using different methods of stability analysis. Switching systems are increasingly used in the electronics and mechanical industry, e.g., for power electronics and the automotive industry. This is due to their flexibility and simplicity for controlling accurately industrial mechanisms. By adopting appropriate control rules, we can steer a switching system to a region centered at a desired equilibrium point while avoiding "unsafe" regions of parameter saturation.

The authors explain various correct-by-design methods for control synthesis, using different methods of stability and invariance analysis. They also provide several applications of these methods to industrial examples of power electronics.

Contents

2. Sampled Switched Systems.
5. Application to Multilevel Converters.
6. Other Issues: Reachability, Sensitivity, Robustness and Nonlinearity.

After reviewing some definitions on systems of systems engineering, the book focuses on concrete applications and offers a survey of the activities and techniques that allow engineering of complex systems and systems of systems.

Contents

Part 1. Engineering Large-Scale Complex Systems and Emergency Situation Management
1. Engineering Large-scale Complex Systems.

Part 2. Case Study: Antarctica Life Support Facility
3. Introduction to the Antarctica Life Support Facility Case Study.
4. Finding the Right Problem.
5. Who Can Solve the Problem?
6. Solving the Problem.
7. Solving the Problem Completely, in a Coherent and Optimal Manner.
8. Anticipating Integration, Verification and Validation.
9. Conclusion to the "Antarctica Life Support Facility" Case Study.

The book is designed in a didactic way, illustrated with real world examples, so that it can be understood by non-specialists, but can also prove very valuable for M&S experts who want to expand their view of the field.

Contents

3. Credibility in Modeling and Simulation.
7. Distributed Simulation.
8. The Battle Lab Concept.
9. Conclusion: What Return on Investment Can We Expect from Simulation.
Competitive Quality Strategies • IWEI 2011
Edited by Martin Zelm, M. van Sinderen, Guy Doumeingts and Pontus Johnson
June 2011 • 288 pages • USD 127.00
ISBN: 9781848213173 • Title co-published with Wiley


Contents
1. Enterprise 2.0, using the Internet 2.0 Technologies in the Enterprise Management.
3. Advanced Results in MDI / SOA Innovation.
4. Standards Ensuring Enterprise Interoperability and Collaboration, the State of Art and the Perspectives.

Advanced Mobility and Transport Engineering
Edited by Slim Hammadi, Ecole Centrale de Lille, France and Mekki Ksouri, Tunis El Manar University, Tunisia
May 2012 • 272 pages • USD 125.00
ISBN: 9781848213777 • Title co-published with Wiley

The goal of this book is to design and develop methodologies in order to realize a MIS tool which can ensure permanent multimodal information availability before and during travel, considering passengers’ mobility.

The authors propose methods and tools that help transport network customers to formulate their requests when they connect to their favorite information systems through PC, laptop, cell phone, Portable Digital Assistant (PDA), etc. The MIS must automatically identify the websites concerning the customer’s services. These sites can, in fact, represent transport services, cultural services, tourist services, etc. The system should then be able to collect the necessary travel information from these sites in order to construct and propose the most convenient information according to the user’s requests.

Contents
1. Agent-oriented Road Traffic Simulation.
3. Inter-vehicle Services and Communication.

Human-Computer Interactions in Transport
Edited by Christophe Kolski, University of Valenciennes, France
June 2011 • 400 pages • USD 147.00
ISBN: 9781848212794 • Title co-published with Wiley

Discussing the richness and complexity of the field of transport, the central idea of this book is to examine how an individual can utilize interactive systems, either during the preparation of a trip or during the trip itself, all in the context of mobility.

Contents
5. From Human-machine Interaction to Cooperation: Towards the Integrated Copilot.
6. ICT and New Human-machine Interactions for Trucks and Buses of the Future: e-Truck and e-Bus Perspectives.
11. Transport: a Fertile Ground for the Plasticity of User Interfaces.

Wood Machining
Edited by J. Paulo Davim, University of Aveiro, Portugal
June 2011 • 288 pages • USD 96.00
ISBN: 97818482131593 • Title co-published with Wiley

This book provides some fundamentals and recent research advances on machining wood and wood products.

Contents
1. Machining of Wood and Wood Composites.
2. Wood and Wood-based Panel Machining Quality.
3. Reducing Tool Wear by Cryogenic Treatment and Cooling with Refrigerated Air when Processing Medium Density Fiberboard.
4. Wearing Mechanisms Contributing to Reduced Tool Life after Wood and Secondary Wood Products Machining.
5. Monitoring Surface Quality on Molding and Sawing Processes for Solid Wood and Wood Panels.
Product Lifecycle Management
GEOMETRIC VARIATIONS
Edited by Max Giordano, University of Savoy, Luc Mathieu, Paris-Sud University and François Villeneuve, University of Grenoble, France
9781848212763 • September 2010 • 576 pages • USD 215.00

Geometric Tolerancing of Products
Edited by François Villeneuve, University of Grenoble and Luc Mathieu, Paris-Sud University, France
9781848211186 • May 2010 • 400 pages • USD 160.00

CEISIE’2009
Edited by Bing Wu, Dublin Institute of Technology, Ireland and Jean-Paul Bourières, IMS, University Bordeaux 1, France
9781848211346 • March 2010 • 320 pages • USD 165.00

Supply Chain Performance
COLLABORATION, ALIGNMENT AND COORDINATION
Edited by Valérie Botta-Genoulaz and Jean-Pierre Campagne, INSA Lyon, Daniel Llerena, Grenoble University and Claude Pellegrin, Lyon University, France
9781848212190 • June 2010 • 400 pages • USD 165.00

Sustainable Manufacturing
Edited by J. Paulo Davim, University of Aveiro, Portugal
9781848212121 • April 2010 • 256 pages • USD 107.00

Flexibility and Robustness in Scheduling
Edited by Jean-Charles Billaut, University of Tours, Aziz Moukrim, University of Technology of Compiègne and Eric Sanlaville, University of Clermont-Ferrand, France
9781848210547 • November 2008 • 352 pages • USD 215.00

Petri Nets
FUNDAMENTAL MODELS, VERIFICATION AND APPLICATIONS
Edited by Michel Diaz, LAAS-CNRS, Toulouse, France
9781848210790 • June 2009 • 624 pages • USD 325.00

Intelligent Machining
MODELING AND OPTIMIZATION OF THE MACHINING PROCESSES AND SYSTEMS
Edited by Tugrul Özel, Rutgers University, USA and J. Paulo Davim, University of Aveiro, Portugal
9781848211292 • May 2009 • 288 pages • USD 140.00

Linear Systems
Henri Bourlès, CNAM, France and Godfrey K. C. Kwan
9781848211629 • June 2010 • 592 pages • USD 165.00

Bioprocess Control
Edited by Denis Dochain, KU Leuven, Belgium
9781848210257 • June 2008 • 248 pages • USD 180.00

Analysis and Control of Linear Systems
Edited by Philippe de Larminat, IRCCyN, Nantes, France
9781905209354 • January 2007 • 560 pages • USD 300.00

Resource-Constrained Project Scheduling
MODELS, ALGORITHMS, EXTENSIONS AND APPLICATIONS
Edited by Christian Artigues, LAAS-CNRS, Toulouse, Sophie Demaille, Ecole des Mines de Nantes and Emmanuel Néron, Polytech Tours, France
9781848210349 • February 2008 • 320 pages • USD 160.00

Production Scheduling
Edited by Pierre Lopez and François Roubellat, LAAS-CNRS, Toulouse, France
9781848210172 • April 2008 • 392 pages • USD 215.00

Fault Trees
Nikolaos Limnios, Univeristy of Technology of Compiègne, France
9781905209309 • January 2007 • 224 pages • USD 125.00

Simulation For Supply Chain Management
Edited by Caroline Thierry, University of Toulouse, André Thomas, ENSTIB, Nancy University and Gérard Bel, French Aerospace Lab., France
9781848210905 • June 2008 • 360 pages • USD 160.00

Control of Continuous Linear Systems
Kaddour Najim, INP Toulouse, France
9781905209125 • April 2006 • 352 pages • USD 160.00

Taming Heterogeneity and Complexity of Embedded Control
Edited by Françoise Lamnabhi-Lagarrigue et al., LSS, Supélec, France
9781905209651 • February 2007 • 752 pages • USD 435.00
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Scientific and Technical Topics
(non-exhaustive list)

SIGNAL PROCESSING
Automatic Signal Recognition
Digital Signal Processing Algorithms
Hardware Solid-state Implementation
Linear and Non-linear Digital Signal Processing
Radar Signal Processing
Signal Processing for Navigation-Location
Signal Processing for Telecommunications

IMAGE PROCESSING
Computer Vision and Perception
Computer-generated Imagery and Virtual Reality
Image Processing, Analysis and Transmission
Medical and Satellite Imagery, Industrial Applications
Video and Multimedia

Forthcoming Titles
Digital Signal and Image Processing using Matlab 1 & 2 – 2nd edition by Blanchet Gérard and Charbit Maurice
Dynamic Cardiac and Thoracic Imaging by Clarysse Patrick
Electromagnetic Imaging using Synthetic Aperture Radar by Ferro-Famil Laurent
Inverse Methods Applied to DSP by Giovannelli Jean-François and Idier Jérôme
Mathematical Foundations of Image Processing and Analysis V1 & 2 by Pinoli Jean-Charles
Multiresolution and Wavelets by Denis Florence, Laligant Olivier, Meriaudeau Fabrice and Truchetet Frédéric
Non-linear Methods in Digital Signal Processing by Castanié Francis
Non-linear Digital Encoders for Data Communications by Vladeanu Calin and El Assad Safwan
Probability Theory for Signal Processing by Sintes Christophe and Pastor Dominique
Quaternion Fourier Transforms for Signal and Image Processing by Sangwine Steve, Ell Todd and Le Bihan Nicolas
Recent Advances in Digital Spectral Analysis by Castanié Francis
Tracking with Particle Filter for High-dimensional Observation and State Spaces by Dubuisson Séverine
Wavelet Denoising by Ouahabi Abdeldjalil

Forthcoming Sets

- Image Processing and Mathematical Modeling coordinated by Henri Maître

ISTE catalog May 2014
**Time–Frequency Domain for Segmentation and Classification of Non-stationary Signals**

*The Stockwell Transform Applied on Bio-signals and Electric Signals*

Ali Moukadem, Djaffar Ould Abdeslam and Alain Dieterlen, University of Haute Alsace, France

February 2014 • 160 pages • USD 70.00
ISBN: 9781848216136 • Title co-published with Wiley

The authors of this book present here original methods and algorithms for extracting information from non-stationary signals such as heart sounds and power electric signals. The methods proposed focus on the time–frequency (TF) domain, most notably on the Stockwell transform for the feature extraction process and the identification of signatures.

The advanced signal processing tools and techniques presented in this book and the originality of the authors' contributions will prove very useful for those involved in engineering and research in the field of signal processing, as well as for professionals in industry and healthcare.

**Contents**

1. The Need for Time–Frequency Analysis.
3. Segmentation and Classification of Heart Sounds Based on the S-Transform.
5. FPGA Implementation of the Adaline.

**Medical Imaging Based on Magnetic Fields and Ultrasounds**

Edited by Hervé Fanet, CEA-LETI, France

February 2014 • 288 pages • USD 145.00
ISBN: 9781848215023 • Title co-published with Wiley

The importance of medical imaging for diagnostics is strongly increasing. It is now necessary to have a good knowledge of the different physical principles possible.

This book provides an overview of the progress made in the different domains of imaging from various angles. It describes the principles and types of equipment used in medical imaging.

Chapter 1 focuses on medical ultrasound imaging, exploring the physical principles of ultrasound waves and the key performances of ultrasound systems used for medical diagnosis. A significant part of the chapter presents recent innovations in response to the challenges of imaging within the human body in real time.

Chapter 2 is concerned with magnetic resonance imaging (MRI). It presents the fundamentals of MRI, its instrumentation in a hospital setting, an analysis of image properties, imaging sequences and modes of reconstruction, and finally, the applications of MRI, its uses and its evolution in the biomedical field.

This book offers a rare global approach to the subject of medical imaging to all scientists and engineers working in hospitals or in the medical imaging industry.

**Contents**

1. Ultrasound Medical Imaging.

**Signal Integrity**

*From High Speed to Radiofrequency Applications*

Fabien Ndagijimana, University Joseph Fourier, Grenoble, France

May 2014 • 176 pages • USD 95.00
ISBN: 9781848215504 • Title co-published with Wiley

Presenting the concepts necessary for the design and testing of radiofrequency and high-speed circuits, this book explores signal and propagation theory for various circuit levels, from the chip to the PCB. The co-existence of high-speed wideband signals, radiofrequency signals and supply circuits is developed in order to provide design rules for engineers and Masters-level students – it can also serve as basic training for technicians or engineers wishing to approach the design of high-speed circuits, or mixed digital and radiofrequency systems.

**Contents**

1. Degradation of Rise Time in Interconnects.
2. Electromagnetic Modeling of Interconnects.
3. Controlled Impedance Interconnects.
5. The S-Parameters Testing Technique.
6. Time-Domain Reflectometry Analysis.
Cluster or co-cluster analyses are important tools in a variety of scientific areas. The introduction of this book presents a state of the art of already well-established, as well as more recent methods of co-clustering. The authors mainly deal with the two-mode partitioning under different approaches, but pay particular attention to a probabilistic approach.

Chapter 1 concerns clustering in general and the model-based clustering in particular. The authors briefly review the classical clustering methods and focus on the mixture model. They present and discuss the use of different mixtures adapted to different types of data. The algorithms used are described and related works with different classical methods are presented and commented upon. This chapter is useful in tackling the problem of co-clustering under the mixture approach.

Chapter 2 is devoted to the latent block model proposed in the mixture approach. The authors discuss this model in detail, the appropriated latent block mixture models. Variants of these models and algorithms are presented and illustrated using examples.

Chapter 4 focuses on contingency data. Mutual information, phi-squared and model-based co-clustering are studied. Models, algorithms and connections among different approaches are described and illustrated.

Chapter 5 presents the case of continuous data. In the same way, the different approaches used in the previous chapters are extended to this situation.

**Contents**

1. Cluster Analysis.
2. Model-Based Co-Clustering.
3. Co-Clustering of Binary and Categorical Data.
4. Co-Clustering of Contingency Tables.
5. Co-Clustering of Continuous Data.
**MRI Techniques**

Vincent Perrin, Poissy, France

This book allows readers with the basics of physics and mathematics within the field MRI to easily immerse themselves in techniques that are not familiar to them. Pragmatic in approach, moving between the physics underlying the techniques being studied and the clinical examination of images, it will also be of interest to radiologists looking to define protocols or make better use of the images obtained.

**Contents**

1. Flow.
2. Diffusion.
3. Perfusion.
4. Functional MRI.

This book is published by Wiley.

September 2013 • 240 pages • USD 95.00
ISBN: 9781848215030 • Title co-published with Wiley

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**3D Video**

**From Capture to Diffusion**

Edited by Laurent Lucas, Céline Loscos and Yannick Remion, University of Reims Champagne Ardenne, France

This book guides the reader through the production process of 3D videos; from acquisition, through data treatment and representation, to 3D diffusion. Several types of camera systems are considered (multiscopic or multiview) which lead to different acquisition, modeling and storage-rendering solutions.

**Contents**

Part 1. 3D Acquisition of Scenes
1. Foundation.
4. Shooting and Viewing Geometries in 3DTV.
Part 2. Description/Reconstruction of 3D Scenes
7. Multi- and Stereoscopic Matching, Depth and Disparity.
8. 3D Scene Reconstruction and Structuring.
Part 3. Standards and Compression of 3D Video
10. Multiview Video Coding (MVC).
11. 3D Mesh Compression.
Part 4. Rendering and 3D Display
14. HD 3DTV and Autostereoscopy.
15. Augmented and/or Mixed Reality.
17. 2D–3D Conversion.
Part 5. Implementation and Outlets
18. 3D Model Retrieval.
19. 3D HDR Images and Videos: Acquisition and Restitution.
20. 3D Visualization for Life Sciences.
21. 3D Reconstruction of Sport Scenes.

This book is published by Wiley.

October 2013 • 480 pages • USD 130.00
ISBN: 9781848215078 • Title co-published with Wiley

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**Multi-factor Models and Signal Processing Techniques**

**Application to Quantitative Finance**

Serge Darolles, University of Paris-Dauphine, Patrick Duvaut, Telecom ParisTech and Emmanuelle Jay, QAMLab SAS, Paris, France

With recent outbreaks of multiple large-scale financial crises, amplified by interconnected risk sources, a new paradigm of fund management has emerged. This new paradigm leverages "embedded" quantitative processes and methods to provide more transparent, adaptive, reliable and easily implemented "risk assessment-based" practices.

This book surveys the most widely used factor models employed within the field of financial asset pricing. Through the concrete application of evaluating risks in the hedge fund industry, the authors demonstrate that signal processing techniques are an interesting alternative to the selection of factors (both fundamentals and statistical factors) and can provide more efficient estimation procedures, based on lq regularized Kalman filtering for instance.

With numerous illustrative examples from stock markets, this book meets the needs of both finance practitioners and graduate students in science, econometrics and finance.

**Contents**

Foreword, Rama Cont.
1. Factor Models and General Definition.
2. Factor Selection.
3. Least Squares Estimation (LSE) and Kalman Filtering (KF) for Factor Modeling: A Geometrical Perspective.
4. A Regularized Kalman Filter (rgKF) for Spiky Data.
Appendix: Some Probability Densities.

This book is published by Wiley.

July 2013 • 192 pages • USD 105.00
ISBN: 9781848214194 • Title co-published with Wiley

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**Blind Identification and Separation of Complex-valued Signals**

Eric Moreau, University of Toulon, France and Tülay Adali, University of Maryland, Baltimore County, USA

The authors of this book consider the blind identification and source separation problem in the complex-domain, where the available statistical properties are richer and include non-circularity of the sources-underlying components.

They define identifiability conditions and present state-of-the-art algorithms that are based on algebraic methods as well as iterative algorithms based on maximum likelihood theory.

**Contents**

1. Mathematical Preliminaries.
2. Estimation by Joint Diagonalization.
3. Maximum Likelihood ICA.

This book is published by Wiley.

September 2013 • 112 pages • USD 55.00
ISBN: 9781848214590 • Title co-published with Wiley
PtNLMS adaptive filtering algorithms estimate an unknown impulse response by adaptively giving gains proportionate to an estimate of the impulse response and the current measured error.

Contents
1. Introduction to PtNLMS Algorithms.
2. PtNLMS Analysis Techniques.
7. Computational Complexity for PtNLMS Algorithms.

Digital Color Imaging
Edited by Christine Fernandez-Maloigne, University of Poitiers, Frédérique Robert-Inacio, IM2NP and ISEN, Toulon and Ludovic Macaire, Lille 1 University, France

This collective work identifies the latest developments in the field of the automatic processing and analysis of digital color images. For researchers and students, it represents a critical state of the art on the scientific issues raised by the various steps constituting the chain of color image processing. It covers a wide range of topics related to computational color imaging, including color filtering and segmentation, color texture characterization, color invariant for object recognition, color and motion analysis, as well as color image and video indexing and retrieval.

Contents
3. Anisotropic Diffusion PDEs for Regularization of Multichannel Images: Formalisms and Applications.
4. Linear Prediction in Spaces with Separate Achromatic and Chromatic Information.
5. Region Segmentation.
6. Color Texture Attributes.
7. Photometric Color Invariants for Object Recognition.
8. Color Key Point Detectors and Local Color Descriptors.
9. Motion Estimation in Color Image Sequences.

Signal and Image Processing for Biometrics
Edited by Amine Naït-Ali and Régis Fournier, University Paris-Est Créteil, France

This book discusses numerous signal and image processing techniques that are very often used in biometric applications. In particular, algorithms related to hand feature extraction, speech recognition, 2D/3D face biometrics, video surveillance and other interesting approaches are presented. Moreover, in some chapters, Matlab codes are provided so that readers can easily reproduce some basic simulation results.

Contents
1. Introduction to Biometrics.
2. Introduction to 2D Face Recognition.
5. 3D Face Recognition.
6. Introduction to Iris Biometrics.
8. Introduction to Hand Biometrics.
12. Classification Techniques for Biometrics.
15. Biometrics in Forensics.
Digital Signal and Image Processing

Digital Spectral Analysis

Digital Spectral Analysis provides a single source that offers complete coverage of the spectral analysis domain. This self-contained work includes details on advanced topics that are usually presented in scattered sources throughout the literature. The theoretical principles necessary for the understanding of spectral analysis are discussed in the first four chapters: fundamentals, digital signal processing, estimation in spectral analysis, and time-series models. An entire chapter is devoted to the non-parametric methods most widely used in industry. High resolution methods are detailed in a further four chapters: spectral analysis by stationary time series modeling, minimum variance, and subspace-based estimators.

Contents
Part 1. Tools and Spectral Analysis
1. Fundamentals.
3. Introduction to Estimation Theory with Application in Spectral Analysis.
Part 2. Non-Parametric Methods
7. Minimum Variance.
8. Subspace-Based Estimators and Application to Partially Known Signal Subspaces.
Part 4. Advanced Concepts
10. Introduction to Spectral Analysis of Non-Stationary Random Signals.
13. Particle Filtering and Tracking of Varying Sinusoids.

Photon-based Medical Imagery

The importance of medical imaging for diagnostic is strongly increasing. It is now necessary to have a good knowledge of the different physical possible principles.

Contents
1. Physical Basic Principles: Radiation-matter Interaction, its Consequences on Detection and Medical Imaging.
2. Detectors for Medical Imaging.
4. X-ray Tomography.
7. Optical Imaging.

Stochastic Geometry for Image Analysis

New sensors currently provide very high resolution images. Civilian satellites have achieved resolutions of less than one meter, while microscopy is now in the micro-meters. At these resolutions, geometrical information is crucial for analyzing images. In addition, the stochastic framework has proved to be very efficient for analyzing lower resolution images. These models can be extended by considering the stochastic geometry framework.

The book reviews the different models, based on stochastic geometry, used to address image analysis problems. The authors consider the problems of modeling, optimization and parameter estimation. Practical examples are detailed. Numerous applications, covering remote sensing images, biological and medical imaging, are detailed. The two main frameworks considered in this book are the marked point process approach and random closed sets models.

Contents
1. Introduction.
4. Simulation and Optimization.
5. Parametric Inference for Marked Point Processes in Image Analysis.
6. How to Set Up a Point Process?
8. Structure Extraction.

Tools for Signal Compression

This book presents tools and algorithms required to compress/decompress signals such as speech and music. Part 1 presents the standard tools used in compression systems. It discusses the consistency between these different tools. Part 2 is more concrete in nature and explains how these tools are used in the latest speech and audio coders. Part 3 gives examples of Matlab programs simulating these coders.

Contents
1. Tools for Signal Compression
2. Scalar Quantization.
3. Vector Quantization.
4. Sub-band Transform Coding.
5. Entropy Coding.
7. Audio Coding.
8. Audio Coding: Additional Information.
10. A Speech Coder.
11. A Music Coder.
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<th>Title</th>
<th>Editor(s)</th>
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<th>Date</th>
<th>Pages</th>
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<tr>
<td>Inverse Problems in Vision and 3D Tomography</td>
<td>Ali Mohammad-Djafari, L2S, CNRS, France</td>
<td>9781848211728</td>
<td>December 2009</td>
<td>480</td>
<td>USD 215.00</td>
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<td>Mathematical Morphology</td>
<td>Laurent Najman and Hugues Talbot, ESIEE, France</td>
<td>9781848212152</td>
<td>June 2010</td>
<td>528</td>
<td>USD 210.00</td>
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<td>Discrete Stochastic Processes and Optimal Filtering</td>
<td>Jean-Claude Berthet, ESIEE and Roger Ceschi, ESIEE, Amiens France</td>
<td>9781848211810</td>
<td>December 2009</td>
<td>304</td>
<td>USD 140.00</td>
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<td>Visual Perception Through Video Imagery</td>
<td>Michel Dhome, LASMEA, CNRS Clermont-Ferrand, France</td>
<td>9781848210165</td>
<td>February 2009</td>
<td>312</td>
<td>USD 140.00</td>
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<td>Tomography</td>
<td>Pierre Grangeat, CEA LETI and MINATEC, Grenoble, France</td>
<td>9781848210998</td>
<td>June 2009</td>
<td>464</td>
<td>USD 190.00</td>
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<td>Multivariate Image Processing</td>
<td>Christophe Collet, University of Strasbourg, Jocelyn Chanussot, INPG and Kacem Chehdi, University of Rennes 1, France</td>
<td>9781848211391</td>
<td>November 2009</td>
<td>480</td>
<td>USD 165.00</td>
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<td>Data Analysis</td>
<td>Gérard Govaert, University of Technology of Compiègne, France</td>
<td>9781848210981</td>
<td>June 2009</td>
<td>352</td>
<td>USD 160.00</td>
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<td>Optimization in Signal and Image Processing</td>
<td>Patrick Siarry, University Paris 12, France</td>
<td>9781848210448</td>
<td>June 2009</td>
<td>384</td>
<td>USD 190.00</td>
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<td>Processing of Synthetic Aperture Radar Images</td>
<td>Henri Maitre, TELECOM ParisTech, France</td>
<td>9781848210240</td>
<td>June 2008</td>
<td>408</td>
<td>USD 215.00</td>
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<td>Image Processing</td>
<td>Henri Maitre, TELECOM ParisTech, France</td>
<td>9781848210233</td>
<td>September 2008</td>
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<td>USD 180.00</td>
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<td>Scaling, Fractals and Wavelets</td>
<td>Patrice Abry, CNRS, Paulo Gonçalves, INRIA Rhone-Alpes and Jacques Lévy Véhel, INRIA, France</td>
<td>9781848210721</td>
<td>December 2008</td>
<td>512</td>
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<td>Digital Signal Processing using MATLAB®</td>
<td>André Quinquis, DGA, Brest, France</td>
<td>9781848210110</td>
<td>January 2008</td>
<td>432</td>
<td>USD 215.00</td>
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<td>Digital Signal and Image Processing using MATLAB®</td>
<td>Gérard Blanchet and Maurice Charbit, TELECOM ParisTech, France</td>
<td>9781905209132</td>
<td>May 2006</td>
<td>768</td>
<td>USD 230.00</td>
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<td>Compression of Biomedical Images and Signals</td>
<td>Amine Naït-Ali, University of Paris 12 and Christine Cavarro-Menard, University of Angers, France</td>
<td>9781848210288</td>
<td>May 2008</td>
<td>328</td>
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<td>Time-Frequency Analysis</td>
<td>Franz Hlawatsch, Vienna University of Technology, Austria and François Auger, IUT St-Nazaire, France</td>
<td>9781848210332</td>
<td>August 2008</td>
<td>440</td>
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<td>Bayesian Approach to Inverse Problems</td>
<td>Jérôme Idier, IRCCyN, Nantes, France</td>
<td>9781848210325</td>
<td>April 2008</td>
<td>384</td>
<td>USD 190.00</td>
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<tr>
<td>Information Fusion in Signal and Image Processing</td>
<td>Isabelle Bloch, TELECOM ParisTech, France</td>
<td>9781848210196</td>
<td>January 2008</td>
<td>296</td>
<td>USD 180.00</td>
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<td>Two-dimensional Signal Analysis</td>
<td>René Garello, IT – TELECOM Bretagne, France</td>
<td>9781848210189</td>
<td>April 2008</td>
<td>320</td>
<td>USD 180.00</td>
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<tr>
<td>Modeling, Estimation and Optimal Filtering in Signal Processing</td>
<td>Mohamed Najim, University of Bordeaux I, France</td>
<td>9781848210226</td>
<td>April 2008</td>
<td>416</td>
<td>USD 220.00</td>
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<td>Wavelets and their Applications</td>
<td>Michel Misiti, Yves Misiti, Georges Oppenheim and Jean-Michel Poggi, University of Paris 11, France</td>
<td>9781905209316</td>
<td>May 2007</td>
<td>352</td>
<td>USD 215.00</td>
</tr>
<tr>
<td>Channel Coding in Communication Networks</td>
<td>Alain Glavieux, ENST Bretagne, France</td>
<td>9781905209248</td>
<td>January 2007</td>
<td>440</td>
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<td>Digital Filters Design for Signal and Image Processing</td>
<td>Mohamed Najim, University of Bordeaux I, France</td>
<td>9781905209453</td>
<td>October 2006</td>
<td>392</td>
<td>USD 250.00</td>
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## Scientific Committee

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Hervé Le Treut, UPMC and Institut Pierre-Simon Laplace, Paris, France  
Christine Provost, University Pierre and Marie Curie, Paris, France

## Scientific and Technical Topics  
*(non-exhaustive list)*

<table>
<thead>
<tr>
<th>Topic</th>
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<tr>
<td>Atmosphere</td>
<td>Numerical Modeling</td>
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<td>Environmental Geology</td>
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<td>Natural Hazards</td>
<td>Stratigraphy</td>
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<td>Natural Resources</td>
<td>Tectonics</td>
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## Forthcoming Titles

Infrared Earth’s Atmosphere Observation *by Herbin Hervé and Dubuisson Philippe*
Environmental Hydraulics Series
Edited by Jean-Michel Tanguy,
Ministry of Sustainable Development, France

Volume 1
Physical Processes and Measurement Devices
9781848211537 • October 2010 • 672 pages • USD 215.00

Volume 2
Mathematical Models
9781848211544 • October 2010 • 576 pages • USD 215.00

Volume 3
Numerical Methods
9781848211551 • October 2010 • 416 pages • USD 215.00

Volume 4
Practical Applications in Engineering
E9781848211568 • October 2010 • 432 pages • USD 215.00

Volume 5
Modeling Software
9781848211575 • October 2010 • 304 pages • USD 165.00

Modeling Living Systems
FROM CELL TO ECOSYSTEM
Alain Pavé, Claude Bernard University Lyon 1, France

October 2012 • 640 pages • USD 245.00
ISBN: 9781848214231 • Title co-published with Wiley

Modeling is now one of the most efficient methodologies in life sciences. From practice to theory, this book develops this approach illustrated by many examples; general concepts and the current state of the art are also presented and discussed.

An historical and general introduction informs the reader how mathematics and formal tools are used to solve biological problems at all levels of the organization of life.

The core of this book explains how this is done, based on practical examples coming, for the most part, from the author’s personal experience. In most cases, data are included so that the reader can follow the reasoning process and even reproduce calculus. The final chapter is devoted to essential concepts and current developments.

The main mathematical tools are presented in an appendix to the book and are written in an adapted language readable by scientists, professionals or students, with a basic knowledge of mathematics.

Contents
5. Compartmental Models.
Appendix 1. Differential Equations.
Appendix 2. Recurrence Equations.
Appendix 3. Fitting a Model to Experimental Results.
Appendix 4. Introduction to Stochastic Processes.
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Scientific and Technical Topics
(non-exhaustive list)

- Biodiversity
- Chemical Ecology
- Climate Change
- Ecogeochemistry
- Environment
- Environment and Health
- Environmental Genomics
- Evolution
- Functional Ecology
- Global Ecology
- Human/Environment Interactions
- Sustainable Development
- Sustainable Interactions
- Symbiosis
- Territorial Ecology
- Theoretical Ecology

Forthcoming Titles

- Adaptation to Extremes by Blanc Stéphane et al.
- Anthropology of Water Relationships by Euzen Agathe
- Chemical Communication in Interspecific Mutualism by Proffit Magali, Schatz B, Hossaert Martine
- Ecological Engineering by Dutoit Thierry
- Ethnobiology: Ecological and Evolutionary Approach by McKey Doyle
- Evolutionary Radiations in the Fossil Record: Events of Increased Biodiversity by Neige Pascal
- Global Ecology by Euzen Agathe
- Global Changes and Biodiversity by Bellard Céline, Courchamp Franck
- Intricate Biocultural Interactions beyond Nature and Culture: People and Figs by Aumeeruddy-Thomas Yildiz, Hossaert-McKey Martine
- Invasive Ants by Bertelsmeier Cleo, Courchamp Franck
- Mineral Interaction by Rebuffat Sylvie, Guyot François
- Overexploitation by Courchamp Franck et al.
- Scientific Ecology by Courchamp Franck et al.
- The Southern Ocean: Biodiversity and Evolution by David Bruno, Saucède Thomas
- Waterfalls by Haghe Jean-Paul

ISTE catalog May 2014

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Scientific and Technical Topics
(non-exhaustive list)

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<th>AC Transmission Grids</th>
<th>Distribution Systems</th>
<th>Permanent Magnets</th>
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<td>Apparatus Insulation</td>
<td>Electric and Magnetic Materials</td>
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<td>Control of Electric Machines</td>
<td>Electromagnetic Theory</td>
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<td>Engineering Management</td>
<td>Power Technology</td>
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<td>DC Transmission Grids</td>
<td>High Voltage Technologies</td>
<td>SmartGrids</td>
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<td>Design of Electric Machines</td>
<td>MicroGrids</td>
<td>SuperGrids</td>
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Forthcoming Titles

Composite Membranes for Advanced Applications in DMFC and PEMFC by Compañ Moreno Vicente, Mollá Romano Sergio and Balado Andreu Andrio
Concentrated Solar Power Generation by Baghzouz Yahia et al.
Eddy Currents by Salon Sheppard, Chari MVK, Ergene Lale
Electric and Hybrid Vehicle Systems by Bouquin David et al.
Electric Energy Regulations by Meda Maurice, Janes Julien
High Tc Superconductivity for Power Grids by Tixador Pascal et al.
HVDC Lines by Allaïs A, Nguefeu S
Positive-energy Building by Quénard Daniel
Power Systems and Restructuring – 2nd edition by Hadjsaïd Nouredine, Sabonnadière Jean-Claude
Solid State Lighting Technologies for Indoor Lighting by Zissis Georges, Buso David, Cachoncinlle Christophe

Forthcoming Sets

- Power Electronics and Power Systems coordinated by Jean-Claude Sabonnadière and Nouredine Hadjsaïd
- Advanced Smartgrids coordinated by Jean-Claude Sabonnadière and Nouredine Hadjsaïd
**ELECTRICAL ENGINEERING**

**Electrochemical Components**
Marie-Cécile Pera, IUT Belfort Montbéliard, Daniel Hissel and Hamid Gualous, University of Franche-Comte and Christophe Turpin, GNRs-LAPLACE, Toulouse, France

July 2013 • 336 pages • USD 125.00
ISBN: 9781848214019 • Title co-published with Wiley

After an introductory chapter reviewing the basics of electrochemistry, Chapter 2 is given over to the storage of electricity in the form of hydrogen. Once hydrogen has been made, we have to be able to convert it back into electricity on demand. This can be done with another energy converter: a fuel cell, the subject of Chapter 3. Such a system is unable to deliver significant dynamics in terms of storage and release of electricity and needs to be supplemented with another solution: a detailed study of supercapacitors is provided in Chapter 4. While the storage systems touched upon in the previous three chapters (hydrogen batteries and supercapacitors) both exhibit advantageous characteristics, at present they are still relatively costly. Thus, the days of the electrochemical accumulator by no means appear to be numbered just yet. This will therefore be the topic of Chapter 5. Finally, on the basis of the elements laid down in the previous chapters, Chapter 6 will focus on electrical hybridization of these storage systems, with a view to enhancing the performance (in terms of energy, lifetime, cost, etc.) of the newly formed system.

**Contents**
1. Basic Concepts of Electrochemistry used in Electrical Engineering.
2. Water Electrolyzers.
5. Electrochemical Accumulators.
6. Hybrid Electrical System.

**Dielectric Materials and Electrostatics**
Olivier Gallot-Lavallée, University Joseph Fourier, Grenoble, France

June 2013 • 224 pages • USD 95.00
ISBN: 9781848216044 • Title co-published with Wiley

This book presents the physical foundations of this discipline and the resulting applications. The first part presents a mathematical and intuitive approach to dielectrics. The second part provides readers with the keys to understanding the physics of solid, liquid and gas insulation.

**Contents**
1. Mathematical Examination of Dielectrics.
2. Physical Examination of Dielectrics.

**Lithium Batteries and Other Electrochemical Storage Systems**
Christian Glaize, University of Montpellier, Sylvie Geniès, CEA, Grenoble, France

July 2013 • 384 pages • USD 145.00
ISBN: 9781848214965 • Title co-published with Wiley

This book begins by showing the diversity of applications for secondary batteries and the main characteristics required of them in terms of storage. After a chapter presenting the definitions and measuring methods used in the world of electrochemical storage, and another that gives examples of the applications of batteries, the remainder of this book is given over to describing the batteries developed recently (end of the 20th Century) which are now being commercialized, as well as those with a bright future. The authors also touch upon the increasingly rapid evolution of the technologies, particularly regarding lithium batteries, for which the avenues of research are extremely varied.

**Contents**
Part 1. Storage Requirements Characteristics of Secondary Batteries Examples of Use
1. Breakdown of Storage Requirements.
Part 2. Lithium Batteries
4. Introduction to Lithium Batteries.
5. The Basic Elements in Lithium-ion Batteries: Electrodes, Electrolytes and Collectors.
6. Usual Lithium-ion Batteries.
7. Present and Future Developments Regarding Lithium-ion Batteries.
8. Lithium-Metal Polymer Batteries.
10. Lithium-Air Batteries.
11. Lithium Resources.
Part 3. Other Types of Batteries
12. Other Types of Batteries.

**Integrated Design by Optimization of Electrical Energy Systems**
Edited by Xavier Roboam, Paul Sabatier University, Toulouse, France

June 2012 • 320 pages • USD 145.00
ISBN: 9781848213890 • Title co-published with Wiley

The aim of this book is to summarize design methodologies based in particular on a systemic viewpoint, by considering the system as a whole.

**Contents**
Systemic Design Methodologies for Electrical Energy Systems

Edited by Xavier Roboam, Paul Sabatier
University, Toulouse, France
October 2012 • 400 pages • USD 165.00
ISBN: 9781848213883 • Title co-published with Wiley

This book proposes systemic design methodologies applied to electrical energy systems, in particular analysis and system management, modeling and sizing tools.

It includes 8 chapters: after an introduction to the systemic approach (history, basics & fundamental issues, index terms) for designing energy systems, this title presents two different graphical formalisms especially dedicated to multidisciplinary devices modeling, synthesis and analysis: Bond Graph and COG/EMR.

Contents

1. Introduction to Systemic Design.
2. The Bond Graph Formalism for an Energetic and Dynamic Approach of the Analysis and Synthesis of Multiphysical Systems.
3. Graphic Formalisms for the Control of Multi-Physical Energetic Systems: COG and EMR.
5. Quality and Stability of Embedded Power DC Networks.

Electrothermics

Edited by Javad Fouladgar, University of Nantes, France
March 2012 • 304 pages • USD 147.00
ISBN: 9781848212428 • Title co-published with Wiley

This book concerns the analysis and design of induction heating of poor electrical conduction materials.

Some innovating applications such as inductive plasma installation or transformers, thermo inductive non-destructive testing and carbon-reinforced composite materials heating are studied. Analytical, semi-analytical and numerical models are combined to obtain the best modeling technique for each case. Each model has been tested with experimental results and validated. The principal aspects of a computational package to solve these kinds of coupled problems are described.

Contents

1. Thermal and Electromagnetic Coupling.
3. Design Methodology of a Very Low-Frequency Plasma Transformer.
5. Induction Heating of Composite Materials.

SmartGrids

Edited by Nouredine Hadjsaïd and Jean-Claude Sabonnadière, Grenoble INP, France
April 2012 • 384 pages • USD 145.00
ISBN: 9781848212819 • Title co-published with Wiley

This book describes future electricity networks that will enable all energy services to become sustainable.

Contents

1. SmartGrids: Motivation, Stakes and Perspectives.
2. From the SmartGrid to the Smart Customer: the Paradigm Shift.
5. The Distribution System Operator at the Heart of the SmartGrid Revolution.
8. Integration of Vehicles with Rechargeable Batteries into Distribution Networks.
9. How Information and Communication Technologies will Shape SmartGrids.
12. The Regulation of SmartGrids.

Lead and Nickel Electrochemical Batteries

Christian Glaize, University of Montpellier, Sylvie Geniès, CEA, Grenoble, France
March 2012 • 320 pages • USD 147.00
ISBN: 9781848213760 • Title co-published with Wiley

This book shows that it is not possible to consider a family of batteries as having fixed, applicable properties and characteristics whatever the application and the technology used in their manufacture. For this reason, the authors have chosen to present the fundamental electrochemical and chemical phenomena involved in as simple and as clear a way as possible.

Contents

Part 1. Universal Characteristics of Batteries
1. Definitions and Methods of Measurement.
2. Lead–Acid Batteries.
3. Internal Composition and Types of Lead–Acid Batteries.
4. Lead Batteries: Main Characteristics.
5. Manufacturing Starting, Lighting and Ignition Batteries.

Part 2. Lead–Acid Batteries
1. The Operation of Lead–Acid Batteries.
2. Internal Composition and Types of Lead–Acid Batteries.
3. Lead Batteries: Main Characteristics.
7. Other Nickel-Based Batteries.

Part 3. Introduction to Nickel-Based Batteries
1. Nickel–Cadmium Batteries.
3. Other Nickel-Based Batteries.

Part 4. Integration of the Decentralized Production into the Electrical Network.
1. Nickel Batteries: Main Characteristics.
4. Other Nickel-Based Batteries.
8. Other Nickel-Based Batteries.
This book describes the wide variety of new technologies and concepts of non-standard antenna systems and how they open the way to a wide range of applications, from personal security and communications to multifunction radars and towed sonars, or satellite navigation systems, with space-time diversity on transmit and receive.

Contents

Part 1. Emerging Concepts
1. Joint Diversity and Beamforming for Downlink Communications.
2. Acoustic Antennas for Biomedical and Industrial Ultrasonic Imaging.
3. Space-time Exploration for Airborne Radars.
Part 2. Technologies
5. From a Molecule to an Electro-optic Antenna.
7. Dual Frequency Millimeter Feed.
10. High Impedance Surface Close to a Radiating Dipole.
Part 3. Detection/Localization
14. Airborne High Precision Location of Radiating Sources.
Part 4. Ultra-wideband

Non-conventional Electrical Machines
Edited by Abderrazak Rezoug, Henri Poincaré University, Nancy and Mohammed-El-Hadi Zaim, Polytech'Nantes, France
November 2011 • 288 pages • USD 147.00
ISBN: 9781848213005 • Title co-published with Wiley

Following a chapter devoted to basic theoretical tools and material properties, this book is devoted to three families of rotating machines defined through their functions (slow speeds and high speed) or through materials (superconductors).

Contents

1. Theoretical Tools and Materials for Electric Machines.
2. Low-speed Teeth Coupling Machines.
3. High-speed Electric Machines.
4. Superconducting Machines.

Electrical Distribution Networks
Edited by Nouredine Hadjsaïd and Jean-Claude Sabonnadière, Grenoble INP, France
May 2011 • 512 pages • USD 197.00
ISBN: 9781848212459 • Title co-published with Wiley

This book describes the fundamental aspects of the new paradigm of distribution grids under the context of restructuring. It emphasizes the incorporation of renewable energy sources in the distribution grid and the needs of an evolution towards smartgrids.

Contents

1. The Electrical Distribution Network: From Heritage to Innovation.
2. Characteristics of Distribution Networks.
5. Impacts of Distributed Generation on the Electrical Network.
7. Voltage Control in Distribution Systems with Dispersed Generation.
8. Grid Integration of Wind Turbine Systems and their Ancillary Services Participation.

Power Electronic Converters
Edited by Eric Monmasson, SATIE, Cergy-Pontoise University, France
March 2011 • 576 pages • USD 195.00
ISBN: 9781848211957 • Title co-published with Wiley

This book covers in detail the main pulse width modulation strategies and current control techniques for controlling power electronic controllers.

Contents

2. Space Vector Modulation Strategies.
3. Overmodulation of Three-phase Voltage Inverters.
5. Delta-Sigma Modulation.
8. Multilevel Voltage Source Inverters.
9. PWM Strategies for Multilevel Converters.
10. PI Current Control of a Synchronous Motor.
13. Hybrid Current Controller with Large Bandwidth and Fixed Switching Frequency.
Classical synchronous motors are the most effective device to drive industrial production systems and robots with precision and rapidity. However, numerous applications require efficient controls in non-conventional situations.

Contents
3. Synchronous Machines in Degraded Mode.
5. Vectorial Modeling and Control of Multiphase Machines with Non-salient Poles Supplied by an Inverter.
6. Hybrid Excitation Synchronous Machines.
7. Advanced Control of the Linear Synchronous Motor.
8. Control of Piezoelectric Actuators.

An asynchronous motor is used in industry nowadays where variation speed and reliability are required and the integration of the electromagnetic converter in industrial environments is increasing. Previously this type of motor operated at fixed speed, but recently it has been integrated more and more in processes at variable speed.

This book provides a survey of the techniques used to detect the faults occurring in electrical drives: electrical, thermal and mechanical faults of the electrical machine, faults of the static converter and faults of the energy storage unit.

Diagnosis of faults occurring in electrical drives is an essential part of a global monitoring system used to improve reliability and serviceability. This diagnosis is performed with a large variety of techniques: parameter estimation, state observation, Kalman filtering, spectral analysis, neural networks, fuzzy logic, artificial intelligence, etc. Particular emphasis in this book is put on the modeling of the electrical machine in faulty situations.

Contents
1. Faults in Electrical Machines and their Diagnosis.
4. Induction Machine Diagnosis using Observers.
7. Electrical and Mechanical Faults Diagnosis of Induction Machines using Signal Analysis.

An asynchroneous motor is used in industry nowadays where variation speed and reliability are required and the integration of the electromagnetic converter in industrial environments is increasing. Previously this type of motor operated at fixed speed, but recently it has been integrated more and more in processes at variable speed. This handbook deals with the asynchronous machine in its close environment. It describes the various aspects of the motor itself, its control and analyzes the diagnosis aspect.

Contents
2. Analog, Numerical Control.
3. Models of Asynchronous Machines.
4. Speed Variation.
5. Tools of Fuzzy Logic.
6. Diagnostics and Signals Pointing to a Change.

This book presents a detailed state of art of PEM fuel cell modeling, with very detailed physical phenomena equations in different physical domains. Examples and a fully coupled multi-physical 1.2 kW PEMFC model are given help the reader better understand how to use the equations.

Contents
1. General Introduction.
2. PEMFC Structure.
3. Why Model a Fuel Cell?
4. How Can a Fuel Cell be Modeled?
5. Literature Models Synthesis.
Part 2. Modeling of the Proton Exchange Membrane Fuel Cell
7. Stack-Level Modeling.
Part 3. 1D Dynamic Model of a Nexa Fuel Cell Stack
12. Model Experimental Validation.
Energy Storage
Edited by Yves Brunet, Grenoble INP, France
9781848211834 • November 2010 • 272 pages • USD 93.00

Dielectric Materials for Electrical Engineering
Edited by Juan Martinez-Vega, Paul Sabatier University, Toulouse, France
9781848211650 • February 2010 • 608 pages • USD 215.00

Electrical Actuators
IDENTIFICATION AND OBSERVATION
Edited by Bernard de Fornel, ENSEEIHT, Toulouse and Jean-Paul Louis, ENS Cachan, France
9781848210967 • April 2010 • 496 pages • USD 190.00

Electric Drives
DESIGN METHODOLOGY
Marcel Jufer, Emeritus Professor at EPFL, Switzerland
9781848212176 • June 2010 • 240 pages • USD 125.00

Rotating Electrical Machines
René Le Doeuff, University of Nantes and Mohamed-El Hadi Zaïm, Polytech’Nantes, Saint-Nazaire, France
9781848211695 • June 2010 • 304 pages • USD 125.00

Automotive Electricity
ELECTRIC DRIVES
Edited by Joseph Beretta, PSA Peugeot Citroën, France
9781848210950 • February 2010 • 336 pages • USD 145.00

Low Emission Power Generation Technologies and Energy Management
Edited by Jean-Claude Sabonnadière, Grenoble INP, France
9781848211360 • October 2009 • 480 pages • USD 180.00

Power Systems and Restructuring
Nouredine Hadjsaïd and Jean-Claude Sabonnadière, Grenoble INP, France
9781848211209 • September 2009 • 704 pages • USD 250.00

Renewable Energy Technologies
Edited by Jean-Claude Sabonnadière, Grenoble INP, France
9781848211353 • June 2009 • 512 pages • USD 180.00

LEDs for Lighting Applications
Edited by Patrick Mottier, CEA-LETI, Grenoble, France
9781848211452 • May 2009 • 296 pages • USD 135.00

The Finite Element Method for Electromagnetic Modeling
Edited by Gérard Meunier, G2Elab-INPG, Grenoble, France
9781848210301 • August 2008 • 624 pages • USD 280.00

Control Methods for Electrical Machines
Edited by René Husson, INPL-ENSEM, Nancy, France
9781848210936 • April 2009 • 400 pages • USD 165.00

Electric Power Systems
Edited by Michel Crappe, Faculté Polytechnique, Mons, Belgium
9781848210080 • March 2008 • 392 pages • USD 220.00

Protection of Electrical Networks
Christophe Prévé, AREVA, Mâcon, France
9781905209064 • June 2006 • 512 pages • USD 220.00
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Scientific and Technical Topics
(non-exhaustive list)

Analog Electronics
Circuit Theory and Design
Components and Devices
Digital Electronics
Displays
Electronic Materials
Embedded Systems
Imaging Systems and Technology
Intelligent Systems and Agents
Organic Electronics
Photonics and Lasers
Power Electronics
Sensors, Instrumentation and Measurement

Forthcoming Titles

Applications using MEMS by Girard Olivier
Biomimetic Optical Devices by Fendler Manuel
Electromechanical Nanosystems by Duraffourg Laurent, Hentz Sébastien, Arcamone Julien
Energy Harvesting with NEMS by Montes Laurent, Ardila Rodriguez Gustavo Adolfo
Microwave Properties of Graphene by Plaçais Bernard, Betz Andreas
Non-volatile Memories by Lacaze Pierre-Camille, Lacroix Jean-Claude
OLED Microdisplays by Templier François
Organic Electronics by Wantz Guillaume
Reversible Calculation for Ultra-low Power by Fanet Hervé
Wide Band Gap Semiconductor Nanowires for Optical Devices, in 2 volumes by Consonni Vincent, Feuillet Guy
Electromagnetic Compatibility in Power Electronics
François Costa, Cyrille Gautier and Bertrand Revol, ENS Cachan and Eric Laboure, Supélec, Gif-sur-Yvette, France

The increasing demand for electrical energy in ground and air transport is leading to the extensive use of equipment based on power electronics. Progress in power semiconductors, the technology at the heart of these devices, has enabled us to greatly increase their energy density with an excellent yield. However, the wide dissemination of these technologies, and the rise in the frequency and speed of the switching of semiconductors is leading to a significant increase in the electromagnetic pollution that they produce.

The phenomena of electromagnetic compatibility in power electronics are discussed and illustrated by the authors of this book using concrete cases from industrial applications. Starting with the concept of a switching cell, the emission of electromagnetic disturbances is explained, modeled, and then the approach is generalized for more complex systems.

Finally, specific means for the reduction of parasitic phenomena are given, more particularly aspects related to power electronics, filtering and shielding.

Contents
1. Phenomena of Perturbation in Electrical Systems.
2. Fundamental Principles.

December 2013 • 288 pages • USD 145.00
ISBN: 9781848215045 • Title co-published with Wiley
Ferroelectric Dielectrics Integrated on Silicon
Edited by Emmanuel Defaÿ, CEA LETI Minatec, Grenoble, France

This book describes up-to-date technology applied to high-K materials for More Than Moore applications, i.e. microsystems applied to microelectronics core technologies.

Contents
1. The Thermodynamic Approach.
2. Stress Effect on Thin Films.
3. Deposition and Patterning Technologies.
5. Physicochemical and Electrical Characterization.
7. Leakage Currents in PZT Capacitors.
8. Integrated Capacitors.
10. Ferroelectric Tunable Capacitors.
12. Integration of Multiferroic BiFeO3 Thin Films into Modern Microelectronics.

Electromagnetism
MAXWELL EQUATIONS WAVE PROPAGATION AND EMISSION
Tamer Bécherrawy, Consultant, France

This book deals with electromagnetic theory and its applications at the level of a senior-level undergraduate course for science and engineering. The basic concepts and mathematical analysis are clearly developed and the important applications are analyzed. Each chapter contains numerous problems ranging in difficulty from simple applications to challenging. The answers for the problems are given at the end of the book. Some chapters which open doors to more advanced topics, such as wave theory, special relativity, emission of radiation by charges and antennas, are included.

Contents
1. Prologue.
2. Electrostatics in Vacuum.
3. Conductors and Currents.
4. Dielectrics.
5. Special Techniques and Approximation Methods.
7. Magnetism in Matter.
8. Induction.
11. Reflection, Interference, Diffraction and Diffusion.
13. Special Relativity and Electrodynamics.
14. Motion of Charged Particles in an Electromagnetic Field.
15. Emission of Radiation.

Chemistry in Microelectronics
Edited by Yannick Le Tiec, CEA-LETI, France

Microelectronics is a complex world where many sciences need to collaborate to create nano-objects: we need expertise in electronics, microelectronics, physics, optics and mechanics also crossing into chemistry, electrochemistry, as well as biology, biochemistry, and medicine.

Chemistry is involved in many fields from materials, chemicals, from gas to liquids or salts, the basics of reactions, and equilibrium to optimized cleaning of surfaces, and selective etching of specific layers, with a daily focus on decreasing the size of the transistors.

Contents
2. Chemistry in Interconnects.
3. The Chemistry of Wet Surface Preparation: Cleaning, Etching and Drying.
4. The Use and Management of Chemical Fluids in Microelectronics.

Numerical Analysis in Electromagnetics • THE TLM METHOD
Pierre Saguet, Grenoble INP, France

This book gives a broad overview of the TLM (Transmission Line Matrix) method, which is one of the “time-domain numerical methods”. These methods are reputed for their significant reliance on computer resources.

Application examples are included in the last two chapters of the book, enabling the reader to draw conclusions regarding the performance of the implemented techniques and, at the same time, to validate them.

Contents
1. Basis of the TLM Method: the 2D TLM Method.
2. 3D Nodes.
4. The TLM Method in Matrix Form and the Z Transform.
   Appendix A. Development of Maxwell’s Equations using the Z Transform with a Variable Mesh.
   Appendix B. Treatment of Plasma using the Z Transform for the TLM Method.
Electromagnetic Reverberation Chambers
Philiippe Besnier, IETR/INSA, Rennes and Bernard Démoulin, IEMN, Lille, France
August 2011 • 432 pages • USD 197.00
ISBN: 9781848212930 • Title co-published with Wiley

Dedicated to a complete presentation on all aspects of reverberation chambers, this book provides the physical principles behind these test systems in a very progressive manner. The detailed panorama of parameters governing the operation of electromagnetic reverberation chambers details various applications such as radiated immunity, emissivity, and shielding efficiency experiments.

In addition, the reader is provided with the elements of electromagnetic theory and statistics required to take full advantage of the basic operational rules of reverberation chambers, including calibration procedures. Comparisons with other testing systems (TEM cells, anechoic chambers) are also discussed.

Contents
2. Main Physical Features of Electromagnetic Cavities.
4. Impact of the Physical and Technological Parameters of a Reverberation Chamber.
5. Radiated Immunity Tests in a Reverberation Chamber.

Silicon Technologies
ION IMPLANTATION AND THERMAL TREATMENT
Edited by Annie Baudrant, CEA-LETI, Grenoble, France
May 2011 • 368 pages • USD 147.00
ISBN: 9781848213312 • Title co-published with Wiley

The main purpose of this book is to remind new engineers in silicon foundry of the fundamental physical and chemical rules in major front end silicon treatments: oxidation, epitaxy, ion implantation and impurities diffusion, as well as giving a survey of the equipment used in IC foundries.

Contents
1. Oxidation of Silicon and Silicon Carbide.
2. Ion Implantation.
4. Epitaxial Heterostructures Constraints Si/Si1-x Gex.

Integration of Ferroelectric and Piezoelectric Thin Films
CONCEPTS AND APPLICATIONS FOR MICROSYSTEMS
Edited by Emmanuel Defayé, CEA–LETI Minatec, Grenoble, France
February 2011 • 432 pages • USD 205.00
ISBN: 9781848212398 • Title co-published with Wiley

This book contains all the necessary knowledge to enable a complete understanding of how piezoelectric and ferroelectric thin films work, providing the key to integrating them into microsystems. Topics covered include: deposition methods, contamination, key processes, and characterization. The basic concepts are detailed within a framework of thermodynamics: ferro-para phase transition, strain-stress relations, dielectric formalism, piezoelectricity, electrostriction and acoustics. An extended part of this book is dedicated to state-of-the-art applications in all fields of microsystems.

Contents
1. Dielectricity, Piezoelectricity, Pyroelectricity and Ferroelectricity.
3. Ferroelectric-paraelectric Phase Transition Thermodynamic Modeling.
4. Mechanical Formalism.
5. Dielectric Formalism.
6. Piezoelectric Formalism.
7. Acoustic Formalism.
8. Electrostrictive Formalism.
10. Piezoelectric Resonators and Filters.
11. High Overtone Bulk Acoustic Resonator (HBAR).
12. Electrostrictive Resonators.
13. Thin Film Piezoelectric Transducers.

Microwave Photonic Links
COMPONENTS AND CIRCUITS
Christian Rumelhard, Catherine Algani and Anne-Laure Billabert, CNAM, France
February 2011 • 432 pages • USD 205.00
ISBN: 9781848212268 • Title co-published with Wiley

This book presents electrical system models for the different elements of a photonic microwave link such as lasers, external modulators, optical fibers, photodiodes and phototransistors. It also describes an original methodology for the evaluation of the performances of a microwave photonic link, based on the previously developed electrical models. This can be easily incorporated into commercially available circuit simulation software, enabling the reader to simulate the complete photonic link.

Contents
1. General Points.
2. Generation and Modulation of Light.
3. Optical Fibers and Amplifiers.
4. Photodetectors.
5. Performance of Microwave Photonic Links.
6. Complement to Microwave Photonic Link Performances.
7. Electronic Amplifiers in Microwave Photonic Links.
8. Simulation and Measurement of Microwave Photonic Links.
## Backlist Titles

**Lithography**  
Edited by Stefan Landis, CEA-LETI-Minatec, Grenoble, France  
9781848212022 • November 2010 • 416 pages • USD 155.00

**Physics and Operation of Silicon Devices in Integrated Circuits**  
Edited by Jacques Gautier, CEA-LETI-Minatec, Grenoble, France  
9781848211636 • September 2009 • 400 pages • USD 165.00

**VHF / UHF Filters and Multicouplers**  
APPLICATIONS OF AIR RESONATORS  
Bernard Piette, Consultant Engineer, France  
9781848211735 • January 2010 • 320 pages • USD 165.00

**Silicon Non-Volatile Memories**  
PATHS OF INNOVATION  
Barbara de Salvo, CEA-LETI, France  
9781848211056 • August 2009 • 256 pages • USD 155.00

**Passive RF Integrated Circuits**  
MODELING, CHARACTERIZATION AND MEASUREMENT  
Edited by Pierre Saguet, Ecole Nationale Supérieure d'Electronique de Grenoble, France.  
9781848211759 • October 2009 • 288 pages • USD 140.00

**Solid-State Physics for Electronics**  
André Moliton, University of Limoges, France  
9781848210622 • June 2009 • 416 pages • USD 220.00

**Chemical and Biological Microsensors**  
APPLICATIONS IN LIQUID MEDIA  
Edited by Pierre Fabry and Jacques Fouletier, Grenoble University, France  
9781848211421 • December 2009 • 352 pages • USD 165.00

**Optoelectronic Sensors**  
Edited by Didier Decoster and Joseph Harari, Polytech’Lille, France  
9781848210783 • May 2009 • 288 pages • USD 115.00

**Power Electronics Semiconductor Devices**  
Edited by Robert Perret, Grenoble INP, France  
9781848210646 • March 2009 • 576 pages • USD 220.00

**Electromagnetism and Interconnections**  
ADVANCED MATHEMATICAL TOOLS FOR COMPUTER-AIDED SIMULATION  
Stéphane Charruau, University of Bordeaux I, France  
9781848211070 • December 2008 • 312 pages • USD 160.00
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Scientific and Technical Topics
(non-exhaustive list)

Bio-Energies, Biofuels
Cogeneration, Heat Production, Coldness Production
Embedded Systems, Power Integration, Micro Batteries, Piezoelectricity, Nanotechnologies and Microsystems for Energy
Energy Demand, Energy Scenarios, Regulations and Energy-Environment Policies
Energy Efficiency, Combustion, Propulsion, Electric and Hybrid Vehicles
Energy Management in Buildings, Positive Energy Buildings, Smart-Cities
Energy Recovery, Thermoelectricity
Energy Storage, Batteries, Supercapacities, Hydrogen, Fuel Cells
Energy Transport, Energy Networks, SmartGrids
Fossil Energies, Geological Resources, Geothermal Energy, Strategic Metals
Nuclear Energy
Renewable Energy
Solar Energy Conversion, Photovoltaics, Concentrating Solar Energy, Solar Thermal
Wind Energy, Ocean Energies

Forthcoming Titles and Sets
Forthcoming Titles

Automatic Real-time Implementation (Modeling, Control and Observers) by Essounbouli Najib
Carbon-based or Pseudocapacitive Materials Supercapacitors  
by Brousse Thierry, Favier Frédéric, Simon Patrice
Electrochemical Energy Storage by Tarascon Jean-Marie, Simon Patrice
Electrochemical Treatment of Glycerol by Coutanceau C
Electrodes Formulation / Fabrication and Architectures / Properties / Performance Relationships  
by Lestriez Bernard, Morcrette Mathieu
Energy Storage in Electric Power Grids  
by Robyns Benoît, François Bruno, Delille Gauthier, Saudemont Christophe
Energy Storage in Transportation and Buildings by Robyns Benoît, Saudemont Christophe, Merdassi Asma,  
Hissel Daniel, Roboam Xavier, Sareni Bruno, Pouget Julien, François Bruno
Inorganic Batteries: 2D Thin Systems to 3D Massive Batteries by Viallet Virginie, Dollé Mickael, Bouchet Renaud
Intelligence in Energy by Kayakutlu Gülgü, Mercier-Laurent Eunika
Luminescence Based Techniques for Photovoltaic Devices by Lombez L
Materials for the Understanding of Mechanisms for More Efficient Li-ion Battery Electrodes  
by Monconduit Laure, Croguennec Laurence, Dedryvère Rémi
Multi-scale Modeling of Batteries and Supercapacitors  
by Franco Alejandro, Salanne Mathieu, Doublet Marie-Liesse
Multifunctional Electrodes Combining Conversion and Energy Storage for Photo-rechargeable Batteries  
by Laberty-Robert Christel, Sauvage Frédéric
Nanothermics by Rossi Carole
New chemistries: beyond Li-ion by Tarascon Jean-Marie, Barboux Philippe, Palacin Rosa
Operando, In-situ and Ex-situ by Ménétrier Michel, Masquelier Christian, Stievano Lorenzo
Organic Redox Materials for Electrochemical Storage: Recent Developments and Prospects  
by Leprêtre Jean-Claude, Poizot Philippe, Dolhem Franck
Solar Energies / Principles and Applications by Bézian Jean-Jacques
Solar Thermal Electricity from Concentrating Solar Systems by Flamant G, Ferrière A, Caliot C
Thermal Energy Storage by Py Xavier

Forthcoming Sets

- Batteries / Electrochemical Storage coordinated by Patrice Simon, Jean-Marie Tarascon
- Concentrated Solar Energy Conversion coordinated by Alain Dollet

ISTE catalog May 2014
Solar Energy at Urban Scale
Edited by Benoît Beckers,
University of Technology of Compiègne, France

May 2012 • 384 pages • USD 165.00
ISBN: 9781848213562 • Title co-published with Wiley

This book collects the points of view of 18 specialists from around the world and proposes a multi-disciplinary and systematic approach concerning specialties as different as meteorology, geography, architecture and urban engineering systems, all surrounding the essential problem of solar radiation.

Contents
2. Territorial and Urban Measurements.
7. Evapotranspiration.
12. Dense Cities in the Tropical Zone.

Energy Geostructures
INNOVATION IN UNDERGROUND ENGINEERING
Lyesse Laloui and Alice Di Donna, Swiss Federal Institute of Technology (EPFL), Lausanne, Switzerland

August 2013 • 320 pages • USD 145.00
ISBN: 9781848215726 • Title co-published with Wiley

Energy geostructures provides a sound basis in the challenging area of energy geostructures.

The objective of this book is to supply the reader with an exhaustive overview on the most up-to-date and available knowledge of these structures. It details the procedures that are currently being applied in the regions where geostructures are being implemented.

Contents
Part 1. Physical Modeling of Energy Piles at Different Scales
1. Soil Response under Thermomechanical Conditions Imposed by Energy Geotextures.
2. Full-scale In Situ Testing of Energy Piles.
Part 3. Engineering Practice

Electricity Production from Renewable Energies
Benoît Robyns, Arnaud Davigny, Antoine Henneton, Jonathan Sprouten, Ecole des Hautes Etudes d’Ingénieur, Lille and Bruno François, Ecole Centrale de Lille, France

February 2012 • 336 pages • USD 127.00
ISBN: 9781848213906 • Title co-published with Wiley

Systems of electricity generation from renewable energy resources of small to medium powers are presented. The basic electrical concepts necessary for understanding the operating characteristics of these energy converters are introduced, and the constraints and problems of integration in the electrical networks of those means of production are discussed.

Contents
1. Decentralized Electricity Production from Renewable Energy.
3. Wind Power.
5. Thermal Power Generation.
6. Integration of the Decentralized Production into the Electrical Network.
FLUID MECHANICS

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Scientific and Technical Topics
(non-exhaustive list)

Aero-/Hydro-Acoustic Waves
Boundary Layer Control
Complex Fluids
Compressible Flows
Convection
Drops and Bubbles
Flow Control
Fluid–Structure Interactions
Fluid Dynamics
Free Shear Layers
Free-Surface Flows
Geophysical and Geological Flows
Heat and Mass Transfer
Instability
Interfacial Flows
Low-Reynolds-number Flows
Micro-/Nano-Fluid Dynamics
Multiphase and Particle-laden Flows
Non-Newtonian Flows
Nonlinear Dynamical Systems
Optimization
Phase Change
Pipe Flows
Plasma
Rarefied Gas Flow
Reacting Flows
Turbulent Flows
Vortex Flows

Forthcoming Titles

Coherent Structures in Parietal Turbulent Flows by Tardu Sedat
Discrete Mechanics by Caltagirone Jean-Paul
Transport and Coherent Structures in Wall Turbulence by Tardu Sedat
Wall Turbulence Control by Tardu Sedat
Numerous industrial systems or natural environments involve multiphase flows with heat and mass transfer. The authors present the physical modeling of these flows, in a unified way, which can include various physical aspects and several levels of complexity. This title is devoted to the description of the mathematical bases of how to incorporate adequate physical ingredients in agreement with known experimental facts and how to make the model evolve according to the required complexity.

**Contents**

Part 1. Approach and General Equations
2. Instant Equations for a Piecewise Continuous Medium.
3. Description of a “Mean Multiphase Medium”.
4. Equations for the Mean Continuous Medium.

5. The Modeling of Interphase Exchanges.
7. Modeling the Mean Gas–Liquid Interface Area per Unit Volume.
8. “Large Eddy Simulation” Style Models.
11. Some Experimental Results Pertaining to Multiphase Flow Properties That Are Still Little Understood.

Part 3. From Fluidized Beds to Granular Media
12. Fluidized Beds.
15. Modeling the Kinetic Cauchy Stress Tensor.

Part 4. Studying Fluctuations and Probability Densities
17. Temperature Fluctuations in Condensed Phases.
18. Study of the PDF for Velocity Fluctuations and Sizes of Parcels.

This book develops concepts and a methodology for a rational description of the organization of three-dimensional flows considering, in particular, the case where the flow is the place of separations. The descriptive analysis based on the critical point theory of Poincaré develops conventional but rather unfamiliar considerations from aerodynamicists, who face the understanding of complex flows including multiple separation lines and vortices.

**Contents**

1. Skin Friction Lines Pattern and Critical Points.
2. Separation Streamsurfaces and Vortex Structures.
4. Vortex Wake of Wings and Slender Bodies.
5. Separation Induced by an Obstacle or a Blunt Body.
6. Reconsideration of the Two-Dimensional Separation.
7. Concluding Remarks.

This book relates fluid flows to chemical reactions. It focuses on the establishment of consistent systems of equations with their boundary conditions and interfaces, which allow us to model and deal with complex situations.

**Contents**

1. Simple Fluids.
2. Reactive Mixtures.
3. Interfaces and Lines.
Appendix: Tensors, Curvilinear Coordinates, Geometry and Kinematics of Interfaces and Lines.
Additional Aspects of Thermostatics.
Tables for Calculating Flows of Ideal Gas.
Extended Irreversible Thermodynamics.
Rational Thermodynamics.
Torsors and Distributors in Solid Mechanics.
Virtual Powers in a Medium with a Single Constituent.
**Laser Metrology in Fluid Mechanics**

Granulometry, Temperature and Concentration Measurements

Edited by Alain Boutier, AFVL, French Association of Laser Velocimetry, France

December 2012 • 352 pages • USD 170.00

ISBN: 9781848213982 • Title co-published with Wiley

This book presents the various techniques of laser velocimetry, as well as their specific qualities: local measurements or in plane maps, mean or instantaneous values, 3D measurements. Flow seeding with particles is described with currently used products, as well as the appropriate aerosol generators. Post-processing of data allows us to extract synthetic information from measurements and to perform comparisons with results issued from CFD codes. The principles and characteristics of the different available techniques, all based on the scattering of light by tiny particles embedded in the flow, are described in detail showing how they deliver different information, either locally or in a map, mean values and turbulence characteristics.

**Contents**

2. Classification of Laser Velocimetry Techniques.
3. Laser Doppler Velocimetry.
4. Optical Barrier Velocimetry.
5. Doppler Global Velocimetry.
6. Particle Image Velocimetry.
7. Seeding in Laser Velocimetry.
8. Post-Processing of LDV Data.

**Laser Velocimetry in Fluid Mechanics**

Edited by Alain Boutier, AFVL, French Association of Laser Velocimetry, France

October 2012 • 432 pages • USD 170.00

ISBN: 9781848213975 • Title co-published with Wiley

The principles and characteristics of the different techniques available in laser velocimetry are described in detail in this book. Velocity, temperature and concentration measurements by spectroscopic techniques based on light scattered by molecules are achieved by different techniques: laser-induced fluorescence, coherent anti-Stokes Raman scattering using lasers and parametric sources, and absorption spectroscopy by tunable laser diodes, which are generally better suited for high velocity flows. The size determination of particles by optical means, a technique mainly applied in two-phase flows, is the subject of another chapter, along with a description of the principles of light scattering.

For each technique the basic principles are given, as well as optical devices and data processing. A final chapter reminds the reader of the main safety precautions to be taken when using powerful lasers.

**Contents**

1. Basics on Light Scattering by Particles.
2. Optical Particle Characterization.
3. Laser-Induced Fluorescence.
5. Nonlinear Optical Sources and Techniques for Optical Diagnostic.

**Statistical Approach to Wall Turbulence**

Sedat Tardu, Grenoble University, France

June 2011 • 336 pages • USD 147.00

ISBN: 9781848212626 • Title co-published with Wiley

A lot of inspired work by experimenters, theoreticians, engineers and mathematicians has been accomplished over recent decades on wall turbulence and Statistical Approach to Wall Turbulence provides an updated and integrated view on the progress made in this area. The book covers the different physical aspects of wall turbulence, beginning with classical phenomenological aspects before advancing to recent research in the effects of the Reynolds numbers, near wall coherent structures, and wall turbulent transport process.

**Contents**

1. Basic Concepts.
4. Reynolds Number-Based Effects.

**Fluid Mechanics for Chemical Engineering**

Mathieu Mory, University of Pau and Pays de l’Adour, France

February 2011 • 448 pages • USD 205.00

ISBN: 9781848212817 • Title co-published with Wiley

With numerous original illustrations, this title provides a new and easily accessible presentation of the subject of fluid mechanics for the most important application areas in chemical engineering.

**Contents**

Part 1. Elements in Fluid Mechanics
1. Local Equations of Fluid Mechanics.
3. Dimensional Analysis.
5. Pumps.
7. Notion of Rheometry.
10. Micromixing and Macromixing.
Part 3. Mechanical Separation
13. Physical Description of a Particulate Medium Dispersed within a Fluid.
15. Particles within the Gravity Field.
17. Centrifugal Separation.
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<th>Pages</th>
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<tr>
<td>Handbook of Compressible Aerodynamics</td>
<td>Jean Délery, ONERA, France</td>
<td>9781848211414</td>
<td>June 2010</td>
<td>768 pages</td>
<td>USD 210.00</td>
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<td>Fundamentals of Fluid Mechanics and Transport Phenomena</td>
<td>Jean-Laurent Peube, University of Poitiers, France</td>
<td>9781848210653</td>
<td>September 2008</td>
<td>512 pages</td>
<td>USD 290.00</td>
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<td>Modeling and Simulation of Turbulent Flows</td>
<td>Roland Schiestel, Institut de Recherche sur les Phénomènes Hors Équilibre (IRPHE), Marseille, France</td>
<td>9781848210011</td>
<td>January 2008</td>
<td>752 pages</td>
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<td>Convective Heat Transfer</td>
<td>Michel Favre-Marinet, Grenoble Institute of Technology and Sedat Tardu, Joseph Fourier University, Grenoble, France</td>
<td>9781848211193</td>
<td>June 2009</td>
<td>400 pages</td>
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<td>Microfluidics</td>
<td>Edited by Stéphane Colin, University of Toulouse, France</td>
<td>9781848210974</td>
<td>May 2010</td>
<td>464 pages</td>
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<td>Edited by Mhamed Souli, University of Lille, France and David J. Benson, University of California, San Diego, USA</td>
<td>9781848211315</td>
<td>January 2010</td>
<td>320 pages</td>
<td>USD 140.00</td>
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<td>Wave Propagation in Fluids</td>
<td>Vincent Guinot, University of Montpellier, France</td>
<td>9781848212138</td>
<td>September 2010</td>
<td>560 pages</td>
<td>USD 215.00</td>
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Paul R. Singh, University of California, Davis, CA, USA

Scientific and Technical Topics
(non-exhaustive list)

Bio-based Materials
Design and Processing of Food and Functional Products
Dispersions and Emulsions
Food Structure, Microstructure and Nanostructure
Food and Packaging Materials Interaction
Food Process Engineering
Hygienic Processing and Cleaning
Modeling and Control of Food Processes
Novel Foods and Ingredients
Packaging
Physical Properties of Foods
Reaction Kinetics in Food Processing and Packaging
Thermal and Preservation Processing
Traceability
Waste Treatments

Forthcoming Sets

- Modeling and Control of Food Processes coordinated by Jack Legrand and Gilles Trystram
GEOGRAPHICAL INFORMATION SYSTEMS
AND TERRITORIAL INTELLIGENCE

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Stephan Winter, University of Melbourne, Australia

Scientific and Technical Topics
(non-exhaustive list)

Acquisition (GPS, Lidar, etc.)
Cartography
Data Bases and Architectures
Data Quality, Uncertainty
Geo-Processing
Geo-web Services
Geography
Geovisualization
Geovisualization
Indoor Navigation and Positioning
Information Retrieval
LBS and Sensors
LBS Chaining and Interoperability
Location Aware Profiling
Mapping
Mobile Information Systems
Mobility, Accessibility
Ontology
Open GeoData
Sensor Databases
Space-time Simulation
Spatial Analysis
Spatial Pattern
Spatial Perception and Cognition
Spatial Reasoning
Spatio-temporal Modeling
Web GIS Architecture

Forthcoming Titles

Agent-Based Spatial Simulation with NetLogo by Banos Arnaud, Lang Christophe and Marilleau Nicolas
Digital Cartography by Plantin Jean-Christophe
3D Modeling of Buildings by Héno Raphaële and Chandelier Laure
Galileo European Satellite Navigation System by Zaharia Dragos
Models within Geomatics Applications by Libourel Thérèse
Spatial Data and Econometrics by Dubé Jean and Legros Diègo
Spatio-temporal Approaches by Mathian Hélène and Sanders Lena

ISTE catalog May 2014

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Innovative Software Development in GIS
Edited by Bénédicte Bucher, COGIT-IGN and Florence Le Ber, ENGEES, France

May 2012 • 352 pages • USD 145.00
ISBN: 9781848213647 • Title co-published with Wiley

This book presents recent software design projects, led in teams, which sometimes have different backgrounds, to address these challenges. It analyzes the specificities of these projects in terms of motivation, data models and analysis methods.

Contents
1. Introduction.
   Part 1. Software Presentation
   2. ORBISGIS: Geographical Information System Designed by and for Research.
   4. Spatiotemporal Knowledge Representation in AROM-ST.
   5. GENGHIS: an Environment for the Generation of Spatiotemporal Visualization Interfaces.
   7. GENEXP-LANDSITES: a 2D Agricultural Landscape Generating Piece of Software.
   8. MDWEB: Cataloging and Locating Environmental Resources.
   9. WEBGEN: Web Services to Share Cartographic Generalization Tools.
   Part 2. Summary and Suggestions
   10. Analysis of the Specificities of Software Development in Geomatics Research.

Fractal Geography
André Dauphiné, University of Nice Sophia-Antipolis, France

December 2011 • 272 pages • USD 127.00
ISBN: 9781848213289 • Title co-published with Wiley

This book presents the algorithms best adapted to the phenomena encountered, and proposes case studies illustrating their applications in concrete situations.

Contents
1. A Fractal World.
2. Auto-similar and Self-affine Fractals.
3. From the Fractal Dimension to Multifractal Spectrums.
4. Calculation and Interpretation of Fractal Dimensions.
6. Calculation and Interpretation of Multifractal Spectrums.
7. Geographical Explanation of Fractal Forms and Dynamics.
9. Land-use Planning and Managing a Fractal Environment.

Simulation of Complex Systems in GIS
Patrice Langlois, University of Rouen, France

January 2011 • 328 pages • USD 153.00
ISBN: 9781848212237 • Title co-published with Wiley

This book provides a comprehensive view of the field of geographical modeling by dividing the topic into three parts.

Contents
Part 1. The Structure of the Geographic Space
   2. Space and Geometry.
   5. Time and Dynamics.
Part 2. Modeling Through Cellular Automata
   7. Concept and Formalization of a CA.
Part 3. A General Model of Geographic Agent Systems
   10. A Formal Ontology of Geographic Agent Systems.

Geographical Information and Urban Transport Systems
Edited by Arnaud Banos, CNRS Géographie-Cités, Paris and Thomas Thévenin, University of Burgundy, Dijon, France

May 2011 • 288 pages • USD 127.00
ISBN: 9781848212282 • Title co-published with Wiley

This book attempts to connect three major dimensions: supply on the one hand, demand on the other, as well the negative aspects – the main risks associated with transport systems.

Contents
   3. Defining Intermodal Accessibility.
   4. Characterizing Form and Functioning of Transportation Networks.
   Part 2. Estimating Transport Demand
   6. Visualizing Daily Mobility: Towards Other Modes of Representation.
GIS AND TERRITORIAL INTELLIGENCE

Backlist Titles

(full details can be found on www.iste.co.uk)

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<th>Title</th>
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<th>ISBN</th>
<th>Date</th>
<th>Pages</th>
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<tr>
<td>Thematic Cartography</td>
<td>Colette Cauvin, and Aziz Serradj, Louis Pasteur University of Strasbourg, France and Francisco Escobar, University of Alcala, Spain</td>
<td>9781848211100</td>
<td>April 2010</td>
<td>504 pages</td>
<td>USD 230.00</td>
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<tr>
<td><strong>Volume 1 – Thematic Cartography and Transformations</strong></td>
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<tr>
<td><strong>Volume 2 – Cartography and the Impact of the Quantitative Revolution</strong></td>
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<td><strong>Volume 3 – New Approaches in Thematic Cartography</strong></td>
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<td>Sustainable Geography</td>
<td>Roger Brunet, Consultant, France</td>
<td>9781848211926</td>
<td>November 2010</td>
<td>424 pages</td>
<td>USD 160.00</td>
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<tr>
<td>Modeling Urban Dynamics</td>
<td>Marius Thériault and François des Rosiers, Laval University, Canada.</td>
<td>9781848212688</td>
<td>December 2010</td>
<td>352 pages</td>
<td>USD 100.00</td>
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<tr>
<td>Graphs and Networks</td>
<td>Philippe Mathis, University of Tours, France</td>
<td>9781848210837</td>
<td>April 2010</td>
<td>496 pages</td>
<td>USD 190.00</td>
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<tr>
<td>Advanced Mapping of Environmental Data</td>
<td>Mikhail Kanevski, Institute of Geomatics and Analysis of Risk, University of Lausanne, Switzerland</td>
<td>9781848210608</td>
<td>May 2008</td>
<td>328 pages</td>
<td>USD 165.00</td>
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<tr>
<td>Spatial Interpolation for Climate Data</td>
<td>Hartwig Dobesch, Institute of Meteorology and Geodynamics, Vienna, Austria, Pierre Dumolard, Joseph Fourier University, Grenoble, France and Izabela Dyras, Institute of Meteorology and Water Management, Krakow, Poland</td>
<td>9781905209705</td>
<td>May 2007</td>
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<td>Models in Spatial Analysis</td>
<td>Lena Sanders, CNRS, University of Paris 7, France</td>
<td>9781905209095</td>
<td>May 2007</td>
<td>352 pages</td>
<td>USD 180.00</td>
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<tr>
<td>Geomarketing</td>
<td>Gérard Cliquet, University of Rennes 1, France</td>
<td>9781905209071</td>
<td>February 2006</td>
<td>328 pages</td>
<td>USD 155.00</td>
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<tr>
<td>Fundamentals of Spatial Data Quality</td>
<td>Rodolphe Devillers, Geography Department of Memorial University of Newfoundland, Canada and Robert Jeansoulin, Center of Mathematics and Computer Sciences of University of Provence, France</td>
<td>9781905209569</td>
<td>April 2006</td>
<td>312 pages</td>
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Florence Sèdes, IRIT, Toulouse, France

Scientific and Technical Topics
(non-exhaustive list)

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<td>Internet of Things</td>
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Forthcoming Titles and Sets
Forthcoming Titles

Archive Digitalization and Management by de Pablo Elisabeth, Lemaitre Francis, Stockinger Peter
Chinese Cybersecurity and Defense by Ventre Daniel
Cybercirminality by Freyssinet Eric
Digital Data Access by Chamoux Jean-Paul
Digital Identity Management by Laurent Maryline, Bouzefrane Samia
Digital Librairies by Papy Fabrice, Stockinger Peter, Dinet Jérôme
Document Management at the Heart of Business Processes: authenticate, protect, operate and maintain the information in the digital environment by Ott Florence, Dessolin-Baumann Sylvie
From Big Data to Smart Data by Iafrate Fernando
Hypertext in the Digital Age by Angé Caroline
Information Systems and Knowledge by Arduin Pierre-Emmanuel, Grundstein Michel et Rosenthal-Sabroux Camille
Information Warfare – 2nd edition by Ventre Daniel
IS and Decision by Salles Maryse
IS and Recommendation Systems by Nègre Elsa
Organizations Digital Communication by de Pablo Elisabeth, Papy Fabrice, Stockinger Peter
Recommender Systems by Kembellec Gérald, Chartron Ghislaine, Saleh Imad

Forthcoming Sets

- Digital Libraries and Collections coordinated by Fabrice Papy
- Advanced Information Systems coordinated by Camille Rosenthal-Sabroux
Spanning the approaches offered by philosophy, military intelligence, algorithmics and information science, this book presents the concepts of information and the confidence placed in it, the methods that militaries, the first to be aware of the need, have or should have adopted, tools to help them, and the prospects that they have opened up.

Beyond the military context, the book reveals ways to evaluate information for the good of other fields such as economic intelligence, and, more globally, the informational monitoring by governments and businesses.

**Contents**

1. Information: Philosophical Analysis and Strategic Applications.
2. Epistemic Trust.
3. The Fundamentals of Intelligence.
8. When Reported Information is Second Hand.
10. Conclusion.

---

Cyber Conflict analyzes the processes of information warfare and cyber warfare through historical, operational and strategic perspectives of cyber attack.

**Contents**

2. Cuba: Towards an Active Cyber-defense.
3. French Perspectives on Cyber-conflict.
8. A Slovenian Perspective on Cyber Warfare.
10. Conclusion.

---

Crowdsourcing is a relatively recent phenomenon that only appeared in 2006, but it continues to grow and diversify (crowdfunding, crowdcontrol, etc.). This book aims to review this concept and show how it leads to the creation of value and new business opportunities.

Chapter 1 is based on four examples: the online-banking sector, an informative television channel, the postal sector and the higher education sector. It shows that in the current context, for a company facing challenges, the crowd remains an untapped resource. The next chapter presents crowdsourcing as a new form of externalization and offers definitions of crowdsourcing. In Chapter 3, the authors attempt to explain how a company can create value by means of a crowdsourcing operation. To do this, authors use a model linking types of value, types of crowd, and the means by which these crowds are accessed.

Chapter 4 examines in detail various forms that crowdsourcing may take, by presenting and discussing ten types of crowdsourcing operation. In Chapter 5, the authors imagine and explore the ways in which the dark side of crowdsourcing might be manifested and Chapter 6 offers some insight into the future of crowdsourcing.

**Contents**

2. Crowdsourcing: A New Form of Externalization.
3. Crowdsourcing and Value Creation.
4. Forms of Crowdsourcing.
5. The Dangers of Crowdsourcing.

---

In order to enable general understanding and to foster the implementation of necessary support measures in organizations, this book describes the fundamental and conceptual aspects of cyberspace abuse. These aspects are logically and reasonably discussed in the fields related to cybercrime and cyberwarfare. The book illustrates differences between the two fields, perpetrators’ activities, as well as the methods of investigating and fighting against attacks committed by perpetrators operating in cyberspace.

The first chapter focuses on the understanding of cybercrime, i.e. the perpetrators, their motives and their organizations. Tools for implementing attacks are also briefly mentioned.

The second chapter deals with cyberwarfare and explains the difference between classic cybercrime and operations taking place in the modern inter-connected world. Countries which have an important role in cyberwarfare around the world, and the significant efforts being made to combat cyberwarfare on national and international levels, are mentioned.

**Contents**

1. Cybercrime.
2. Cyberwarfare.
Managing Complexity of Information Systems

Pirmin Lemberger and Médéric Morel, Alcyonix, SQLI's Group Consulting, France

The authors develop the point of view according to which mastering complexity involves two essential steps: first, one should develop a clear understanding of the real nature of complexity within the IS; second, one should identify the primary causes which contribute to its uncontrolled growth and organize these into a logical framework, in order to define efficient countermeasures. Both technical and psychological causes of complexity are to be considered.

Contents
1. Why Simplicity?
2. Complexity, Simplicity and Abstraction.
3. Value or Values?
5. Simplicity Best Practices.
Appendix 1. Digging into Information Theory.
Appendix 2. Two Measures of Code Complexity.
Appendix 3. Why Has SOA Failed So Often?

Audiovisual Archives

Digital Text and Discourse Analysis

Peter Stockinger, Fondation Maison des Sciences de l'Homme, Paris, France

May 2012 • 384 pages • USD 165.00
ISBN: 9781848213937 • Title co-published with Wiley

This book offers a systematic, comprehensive approach to questions regarding audiovisual archives from a theoretical as well as practical point of view.

Contents
Part 1. The Practical, Technical and Theoretical Context
1. Analysis of an Audiovisual Resource.
2. The Audiovisual Semiotic Workshop (ASW) Studio – A Brief Presentation.
3. A Concrete Example of a Model for Describing Audiovisual Content.
4. Model of Description and Task of Analysis.
Part 2. Tasks in Analyzing an Audiovisual Corpus
5. The Analytical Task of "Describing the Knowledge Object".
6. The Analytical Task of "Contextualizing the Domain of Knowledge".
7. The Analytical Task of "Analyzing the Discourse Production around a Subject".
Part 3. Procedures of Description
9. The Procedure of Free Description of an Audiovisual Corpus.
10. The Procedure of Controlled Description of an Audiovisual Corpus.
Part 4. The ASW System of Metalinguistic Resources
11. An Overview of the ASW Metalinguistic Resources.
12. The Meta-lexicon Representing the ASW Universe of Discourse.

Cyberwar and Information Warfare

Edited by Daniel Ventre, CNRS, France

June 2011 • 448 pages • USD 147.00
ISBN: 9781848213043 • Title co-published with Wiley

This book analyzes the processes of information warfare and cyberwarfare through the historical, operational and strategic perspectives of cyberattacks.

Contents
2. War of Meaning, Cyberwar and Democracies.
3. Intelligence, the First Defense? Information Warfare and Strategic Surprise.
5. Operational Aspects of a Cyberattack: Intelligence, Planning and Conduct.
6. Riots in Xinjiang and Chinese Information Warfare.
7. Special Territories.

Textual Information Access

Statistical Models

Edited by Eric Gaussier, Joseph Fourier University, Grenoble and François Yvon, Paris Sud University Orsay, France

April 2012 • 448 pages • USD 175.00
ISBN: 9781848213227 • Title co-published with Wiley

This book presents statistical models that have recently been developed within several research communities to access information contained in text collections.

Contents
Part 1. Information Retrieval
2. Learnable Ranking Models for Automatic Text Summarization and Information Retrieval.
Part 2. Classification and Clustering
3. Logistic Regression and Text Classification.
Part 3. Multilingualism
Part 4. Emerging Applications
8. Information Mining: Methods and Interfaces for Accessing Complex Information.
Today, audiovisual archives and libraries have become very popular especially in the field of collecting, preserving and transmitting cultural heritage.

However, the data from these archives or libraries constitute as such only potential cognitive resources for a given public. They have to undergo more or less significant qualitative transformations in order to become user- or community-relevant intellectual goods.

Contents
   Part 1. The Segmentation and Description Workshops for Audiovisual Corpora
2. The Segmentation Workshop for Audiovisual Resources.
3. Description Workshop for Audiovisual Corpora.
5. Analysis of the Audiovisual Content.
7. Model of an Audiovisual Publication in the form of a Web Portal.
   Part 2. Technological Environment, Development and New Perspectives
8. The ASW Digital Environment.
9. The ASW Studio.

Digital Audiovisual Archives
Edited by Peter Stockinger, Fondation Maison des Sciences de l’Homme, Paris, France

December 2011 • 320 pages • USD 147.00
ISBN: 9781848213388 • Title co-published with Wiley

This book examines from a theoretical, methodological, technical and practical point of view the question of the (creative) exploitation of digital audiovisual archives. It presents a series of concrete examples of creative uses of digital audiovisual corpora for education, research and cultural heritage preservation and valorization.

Contents
Part 1. Analysis, Rewritings and Republications
1. Analyzing an Audiovisual Corpus of a Thousand and One Nights.
2. Analyzing a Corpus of Traditional Bread Making.
3. Republishing Audiovisual Resources.
Part 2. Audiovisual Archives, Knowledge Management and Cultural Heritage
5. An Audiovisual Azerbaijani Cultural Heritage Portal for Educational and Academic Use.
Part 3. Social Networks, Web 2.0 and Mobile Communication
6. Academic Communication via Facebook and Twitter.
8. Uses for Content Aggregators and Community Networks.
9. Tracing Video Usage: The Potential of VDI.
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Scientific and Technical Topics
(non-exhaustive list)

Earth Metrology, Climate and Universe
Electronics and On-board Systems
Fundamental Metrology, References
Imaging Systems, Tomography and Inverse Problems
Innovative Methods and Technologies for Measurement and Sensors Design
Instrumentation and Medical Imaging

Instruments and Methods for Non-destructive Evaluation
Metrology and Instrumentation in Nanosciences
Microsystems, Microsystems and Microfluidics
Modeling, Data and Signal Processing
Sensors Arrays
Structural Health Monitoring, Smart Systems

Forthcoming Titles
Multisensor Data Fusion by Appriou Alain
New Sensors and Processing Chain by Thomas Jean-Hugh and Yaakoubi Nourdin

Forthcoming Sets
● Fiber Optic Sensors coordinated by Frédéric Taillade
Instrumentation and Metrology in Oceanography
Marc Le Menn, French Naval Hydrographic and Oceanographic Service (SHOM), Brest, France

This book details the functioning of sensors and instruments used to assess the useful parameters in oceanography: temperature, conductivity, pressure, sound velocity, current in magnitude and direction, time and position with global positioning systems, height of water and tide, waves, as well as optical and chemical properties like turbidity, dissolved gas (O2, CO2), pH, nutrients and other dissolved elements.

It also describes the different means used to produce measurements at sea (boats, drifting floats, moorings, undersea platforms, gliders, etc.) and techniques under development. The theoretical functioning of each sensor or instrument, as well as different practical aspects of its use, are also discussed.

Contents
1. What We Measure and What We Process.
3. Measurements at Sea.

Chemical Sensors and Biosensors
Edited by René Lalauze, Ecole Nationale Supérieure des Mines, Saint-Etienne, France

This book places a large emphasis on interaction between chemical and biological species, in a gaseous or liquid state, and details mineral and biological materials acting as sensitive elements. The role of electrical, electrochemical, piezoelectric and optical transducers in detection mechanisms are presented through their developments and from a performance point-of-view. Micro-reactors, nanotechnologies and flexible substrates are considered in relation to their role in neural networks.

Contents
1. Chemical and Biological Recognition.
3. Microcantilever Transduction.
4. Piezoelectric Transduction (QCM).
5. Metal Oxide Gas Sensors.
8. Gas Microsensor Technology.
10. Development of Microtechnologies for the Realization of Chemical, Biochemical and/or Biological Microsensors.
12. Microfluidics: Manipulation of Nanovolume Samples.
15. In Vivo Analyses with Electrochemical Microsensors.
17. Biofuel Cells.

Applied Metrology for Manufacturing Engineering
Ammar Grous, CEGEP, Quebec, Canada

Applied Metrology for Manufacturing Engineering takes a different approach from traditional works in this field due to its inclusion of educational features in the text. It is richly illustrated with tutorials and laboratory models, and is therefore highly accessible to all readers, users, and other non-specialists in the fields of design and manufacturing. Chapters can also be read and understood completely independently of each other.

The book focuses on technical, geometric, and dimensional tolerances as well as mechanical testing and quality control. It also provides references and solved examples to help professionals and teachers to adapt their more general approaches or models to specific real-world or teaching cases.

The contents reflect recent developments in ISO and GPS standards and focus on training that goes hand in hand with practical work dealing with measurement and dimensioning.

Contents
2. Fundamentals of Dimensional and Geometrical Tolerances According to ISO, CSA (Canada), and ANSI (USA).
4. Surface Control.
5. Opto-Mechanical Metrology.
6. Control of Surface States.
7. Computer-Aided Metrology CAM.
8. Control of Assembly and Transmission Elements.
10. Overall Summary.
INSTRUMENTATION AND MEASUREMENT

Backlist Titles
(full details can be found on www.iste.co.uk)

Transverse Disciplines in Metrology
PROCEEDINGS OF THE 13TH INTERNATIONAL METROLOGY CONGRESS, 2007 – LILLE, FRANCE
Edited by the French College of Metrology, France
9781848210486 • February 2009 • 832 pages • USD 385.00

Structural Health Monitoring
Edited by Daniel Balageas, ONERA, Châtillon, France, Claus-Peter Fritzen, University of Siegen, Germany and Alfredo Güemes, Polytechnic University, Madrid, Spain
9781905209019 • January 2006 • 496 pages • USD 250.00

Modern Sensors Handbook
Edited by Pavel Ripka, Czech Technical University, Czech Republic and Alois Tipek, Tyndall, Cork, Ireland
9781905209668 • May 2007 • 536 pages • USD 325.00

Metrology in Industry • The Key for Quality
Edited by the French College of Metrology, France
9781905209514 • March 2006 • 272 pages • USD 140.00

Physical Chemistry of Solid-Gas Interfaces
CONCEPTS AND METHODOLOGY FOR GAS SENSOR DEVELOPMENT
René Lalauze, Ecole des Mines, Saint-Etienne, France
9781848210417 • July 2008 • 448 pages • USD 215.00

Fundamentals of Instrumentation and Measurement
Edited by Dominique Placko, ENS Cachan, France
9781905209392 • March 2007 • 576 pages • USD 290.00

Advanced Ultrasonic Methods for Material and Structure Inspection
Edited by Tribikram Kundu, University of Arizona, USA
9781905209699 • January 2007 • 408 pages • USD 215.00
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Scientific and Technical Topics
(non-exhaustive list)

Carbon Materials
Ceramics
Composites
Construction Materials
Corrosion
Electronic Materials
General Materials Science
Geomaterials
Magnetic Materials
Materials Characterization
Materials for Energy Systems

Materials Processing
Metals and Alloys
Optical and Non-Linear Optical Materials
Organic Electronics
Porous Materials
Properties of Materials
Sensor Materials
Soft Matter
Theory, Modeling and Simulation
Thin Films, Surfaces and Interfaces

Forthcoming Titles and Sets
Forthcoming Titles

3D Imaging in Mechanics of Materials by Buffière Jean-Yves, Maire Éric
Behavior and Models in Fast Dynamics by Couque Hervé
Biocomposites by Baley C
Brittle Fracture by François Dominique, Pineau André
Composite Materials Repairs for Reinforced Concrete Structures by Amziane Sofiane, Ferrier E
Creep by Pineau André et al.
Dimensioning of Composites Materials by Caron Jean-François, Ehrlicher Alain
Dimensioning of Glass Structures by Bernard Fabrice
Ductile Fracture by Pardo et Thomas, Besson Jacques, Chaouadi R
Ductile to Brittle Transition by Tanguy Benoit et al.
Dyes and Chomophores in Polymer Science by Lalevée Jacques, Fouassier Jean-Pierre
Fatigue by Doquet Véronique, Pommier Sylvie
Fracture and Aging of Materials by Mazière Matthieu
Heat Transfer in Polymer Composite Materials by Boyard Nicolas
Local Approach to Fracture: Applications by Joly Pierre, Moinereau Dominique
Local Approach to Fracture: Introduction by François Dominique, Pineau André
Mechanical Properties of Glass by Rouxel Tanguy
Mechanics of Dislocation Fields by Fressengeas Claude
Multi-mechanism Modeling of Inelastic Material Behavior by Cailletaud Georges, Taleb Lakhdar, Sai Kacem
Numerical Methods by Besson Jacques, Feyel Frédéric, Lorentz Éric
Statistical Approaches to Unsaturated Capillary Flows in Pores, Joints, Soils and Other Heterogeneous Media by Ababou Rachid
Surface Roughness and Multiphysical Interactions by Zahouani Hassan, Takadoum Jamal, El Mansori Mohamed
Surfaces Roughness and Functional Impact by Bigerelle Maxence
Technical Ceramics by Montavon Ghislain
Timber Engineering by Jorissen André J.M., Fragiacom Masterino

Forthcoming Sets

Local Approach To Fracture coordinated by André Pineau
Extrusion is by far the most important processing and shaping method for thermoplastic polymers, concerning almost all synthetic polymers, as well as elastomers or food materials.

Extrusion is by far the most important processing and shaping method for thermoplastic polymers, concerning almost all synthetic polymers, as well as elastomers or food materials. *Polymer Extrusion* details the two key extrusion procedures: single-screw and twin-screw extrusion. Single-screw extrusion is mainly used to manufacture finished goods or semi-finished products, as such, more than 90 million tons of thermoplastics are processed every year.

Twin-screw extrusion may be divided into two systems: contra-rotating systems used within the context of PVC extrusion, for the manufacture of pipes or profiles; and co-rotating systems, which are currently experiencing a very important development, due to their increased adaptability and flexibility, enabling the manufacture of specific materials (polymer blends, thermoplastic elastomers, filled polymers, nanocomposites).

The authors present the physics of the mechanisms at stake, then propose models of varying complexity in order to describe these mechanisms, before moving forward in the interpretation of results and the control of flow conditions. This book is particularly aimed at engineers and technicians, researchers, and Masters or PhD students of plastics manufacturing.

**Contents**

1. Continuum Mechanics, Rheology and Heat Transfer Overview.
2. Calculation Methods.
5. Profile Extrusion.
6. Production of Films and Sheets.
7. Wire Coating and Cable Insulation.

---

**Mechanical Vibration and Shock Analysis Series**

**Third Edition**

by Christian Lalanne

Christian Lalanne is a Consultant Engineer who previously worked as an expert at the French Atomic Energy Authority and who has specialized in the study of vibration and shock for more than 40 years. He has been associated with the new methods of drafting testing specifications and associated informatic tools.

**volume 1**

Sinusoidal Vibration

**volume 2**

Mechanical Shock

**volume 3**

Random Vibration

**volume 4**

Fatigue Damage

**volume 5**

Specification Development

This fully updated and revised 3rd edition addresses the entire field of mechanical vibration and shock as one of the most important types of load and stress applied to structures, machines and components in the real world.

Invaluable to engineers specializing in civil, mechanical, aeronautical, electrical and transportation engineering, this reference work, in five volumes is a crucial resource for the solution of shock and vibration problems.
Fatigue Limit in Metals
Claude Bathias, University of Paris 10
La Defense, France

Is there a fatigue limit in metals? This question is the main focus of this book. Written by a leading researcher in the field, Claude Bathias presents a thorough and authoritative examination of the coupling between plasticity, crack initiation and heat dissipation for lifetimes that exceed the billion cycle, leading us to question the concept of the fatigue limit, both theoretically and technologically. This is a follow-up to the Fatigue of Materials and Structures series of books previously published in 2011.

Contents
1. Introduction on Very High Cycle Fatigue.
2. Plasticity and Initiation in Gigacycle Fatigue.
3. Heating Dissipation in the Gigacycle Regime.
This series is devoted to the extraction of metals from ores, concentrates (enriched ores), scraps, and other sources and their refining to the state of either liquid metal before casting or to solid metals.

**Volume 1 • Basic Thermodynamics and Kinetics**
March 2011 • 368 pages • USD 153.00
ISBN: 9781848211605 • Title co-published with Wiley

**Contents**
1. Metallurgical Thermochemistry.
2. Oxides, Sulfides, Chlorides and Carbides.
3. Metal Solutions, Slags and Mattes.
4. Aqueous Electrolytic Solutions and Salt Melts.
5. Reaction Kinetics.
7. Particulate Kinetics.

**Volume 2 • Metallurgical Reaction Processes**
March 2011 • 384 pages • USD 153.00
ISBN: 9781848212879 • Title co-published with Wiley

**Contents**
2. Electrometallurgical Extraction Processes.
3. Halide Extraction Processes.
4. Reduction of Metal Oxides.
5. Oxygen Steelmaking.

**Volume 3 • Processing Operations and Routes**
March 2011 • 384 pages • USD 153.00
ISBN: 9781848212923 • Title co-published with Wiley

**Contents**
1. Physical Extraction Operations.
4. Blast Furnaces.
5. Smelting Reduction Operations.
7. Sulfide and Matte Smelting and Converting Operations.
8. Electric Melting and Smelting Furnaces.
10. Extractive Processing Routes.

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**Damage Mechanics in Metal Forming**
Khemais Saanouni, University of Technology of Troyes, France
April 2012 • 544 pages • USD 245.00
ISBN: 9781848213487 • Title co-published with Wiley

This book summarizes the current most effective methods for modeling, simulating, and optimizing metal forming processes, and to present the main features of new, innovative methods currently being developed which will no doubt be the industrial tools of tomorrow.

It discusses damage (or defect) prediction in virtual metal forming, using advanced multiphysical and multiscale fully coupled constitutive equations.

**Contents**
1. Elements of Continuum Mechanics and Thermodynamics.
2. Thermomechanically-Consistent Modeling of the Metals Behavior with Ductile Damage.
4. Application to Virtual Metal Forming.

**X-Rays and Materials**
Edited by Philippe Goudeau, CNRS, Poitiers and René Guinebretière, ENSCI, Limoges, France

This title presents reviews of various aspects of radiation/matter interactions, be these instrumental developments, the application of the study of the interaction of X-rays and materials to a particular scientific field, or specific methodological approaches. The book provides reference summaries for a range of specific subject areas within a pedagogical framework. Each chapter is written by an author who is well known within their field and who has delivered an invited lecture on their subject area as part of the “RX2009 – X-rays and Materials” colloquium that took place in December 2009 in Orsay in France.

**Contents**
4. Dielectric Relaxation and Morphotropic Phases in Nanomaterials.
Oxidative Ageing of Polymers
Jacques Verdu, Arts et Métiers ParisTech, France

This book rehabilitates kinetic modeling in the domain of polymer ageing, where it has been almost abandoned by the research community. Kinetic modeling is a key step for lifetime prediction, a crucial problem in many industrial domains in which needs cannot be satisfied by the common empirical methods.

Contents
1. Methodological Aspects.
2. Aspects Common to All Oxidation Processes.
3. Basic Kinetic Schemes.
4. Oxidation and Oxygen Diffusion.
5. Stabilization.
6. Molecular Mobility and Reactivity.
7. Structural Changes Caused by Oxidation.

Grain Boundaries and Crystalline Plasticity
Edited by Louise Priester, Paris-Sud University, Orsay, France

This title puts forward the fundamental role of grain boundaries in the plasticity of crystalline materials.

To understand this role requires a multi-scale approach to plasticity: starting from the atomic description of a grain boundary and its defects, moving on to the elemental interaction processes between dislocations and grain boundaries, and finally showing how the microscopic phenomena influence the macroscopic behaviors and constitutive laws.

It involves bringing together physical, chemical and mechanical studies. The investigated properties are: deformation at low and high temperature, creep, fatigue and rupture.

Contents
1. Grain Boundary Structures and Defects.
2. Elementary Grain Boundary Deformation Mechanisms.
5. Intergranular Fatigue.

Carbon-based Solids and Materials
Pierre Delhaes, CNRS and University of Bordeaux, France

It is well known that carbon can be found as a solid in various guises, with different forms of bulk phases as well as more molecular forms. The cause of this range of polymorphism is analyzed in the first part of this book.

The second is a comparative review of the main classes of bulk physical properties of carbon materials. This approach emphasizes in particular the electronic behavior of pi-polyaromatic systems organized in plane and curved atomic sheets.

The third part introduces surface and interface characteristics, together with texture and morphology characteristics of these multi-scale carbon materials.

Contents
Part 1. Carbon Phases, Precursors and Parent Compounds
1. A Historical Overview.
2. Polymorphism of Crystalline Phases.
4. Derivative Compounds and Analogs.
5. From Aromatic Precursors to the Graphene Plane.
Part 2. Physical Properties of Solid Carbons
Part 3. Carbon Materials and Uses
11. Surface and Interface Phenomena.
12. Chemical Reactivity and Surface Treatment.
Fatigue of Materials and Structures
Edited by Claude Bathias, CNAM and André Pineau, ENSMP, France

Written by leading researchers in the field, this 3 volume set provides an authoritative, comprehensive and unified treatment of the mechanics and micromechanisms of fatigue in metals, polymers and composites. Each chapter is devoted to one of the major classes of materials or to different types of fatigue damage, thereby providing overall coverage of the field.

Volume 1 deals with crack initiation, crack growth, low-cycle fatigue, gigacycle fatigue, shorts cracks, fatigue micromechanisms and the local approach to fatigue damage, corrosion fatigue, environmental effects and variable amplitude loadings.

Volume 2 deals with fatigue and high temperature, notch effect, polymers and elastomers, probabilistic aspects, and prediction of crack growth.

Volume 3 deals with multiaxial fatigue, thermomechanical fatigue, fretting-fatigue, influence of defects on fatigue life, cumulative damage and damage tolerance.

### Volume 1
**Fundamentals**

**Contents**
1. Introduction to Fatigue: Fundamentals and Methodology.
2. Modeling of Fatigue Strength and Endurance Curve.
3. Fatigue Crack Initiation.
4. Low-cycle Fatigue.
5. Gigacycle Fatigue.
6. Fatigue Crack Growth Laws.
7. Short Crack Propagation.
9. Local Approach to Fatigue Crack Growth.
10. Corrosion Fatigue.
12. Fatigue under Variable Amplitude Loadings.

### Volume 2
**Application to Damage and Design**

**Contents**
1. High Temperature Fatigue.
3. Fatigue of Composite Materials.
4. Fatigue of Polymers and Elastomers.
5. Probabilistic Design of Structures Submitted to Fatigue.

### Volume 3
**Application to Design and Damage**

**Contents**
1. Multiaxial Fatigue.
2. Cumulative Damage.
3. Damage Tolerance Design.
6. Contact Fatigue.
7. Thermal Fatigue.

---

**Fatigue Limit in Metals**
Claude Bathias, University of Paris 10
La Defense, France

Is there a fatigue limit in metals? This question is the main focus of this book. Written by a leading researcher in the field, Claude Bathias presents a thorough and authoritative examination of the coupling between plasticity, crack initiation and heat dissipation for lifetimes that exceed the billion cycle, leading us to question the concept of the fatigue limit, both theoretically and technologically. This is a follow-up to the Fatigue of Materials and Structures series of books previously published in 2011.
<table>
<thead>
<tr>
<th>Title</th>
<th>Editors/Authors</th>
<th>ISBN</th>
<th>Year</th>
<th>Pages</th>
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<tr>
<td>Mechanical Characterization of Materials and Wave Dispersion</td>
<td>Edited by Yvon Chevalier and Jean Tuong Vinh, ISMEP, St. Ouen, France</td>
<td>9781848211933</td>
<td>June 2010</td>
<td>496</td>
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<td>Machining Composite Materials</td>
<td>Edited by J. Paulo Davim, University of Aveiro, Portugal</td>
<td>9781848211704</td>
<td>November 2009</td>
<td>288</td>
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<td>Edited by Iris Alvarez-Armas, CONICET and UNR, Argentina and Suzanne Degallaix-Moreuil, Ecole Centrale de Lille, France</td>
<td>9781848211377</td>
<td>October 2009</td>
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<td>Fatigue Life Analyses of Welded Structures</td>
<td>Tom Lassen, Agder University College, Grimstad, Norway and Naman Recho, University Blaise Pascal, Clermont-Ferrand, France</td>
<td>9781905209545</td>
<td>October 2006</td>
<td>432</td>
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<td>Heat Transfer in Materials Forming Processes</td>
<td>Jean-Luc Battaglia, University of Bordeaux, France</td>
<td>9781848210523</td>
<td>July 2008</td>
<td>376</td>
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<td>Materials with Rheological Properties</td>
<td>Constantin Cristescu, Institute of Railway Studies and Research, Bucharest, Romania</td>
<td>9781848210127</td>
<td>January 2008</td>
<td>304</td>
<td>USD 180.00</td>
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<td>Ceramic Materials</td>
<td>Edited by Philippe Boch, ESPCI, Paris and Jean-Claude Nièpce, University of Burgundy, France</td>
<td>9781905209231</td>
<td>March 2007</td>
<td>592</td>
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<td>Mechanics of Viscoelastic Materials and Wave Dispersion</td>
<td>Edited by Yvon Chevalier and Jean Tuong Vinh, ISMEP, St. Ouen, France</td>
<td>9781848210776</td>
<td>March 2010</td>
<td>672</td>
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<td>Combined Analysis</td>
<td>Daniel Chatteigner, ENSICAEN, France</td>
<td>9781848211988</td>
<td>June 2010</td>
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<td>Metallurgy and Mechanics of Welding Processes and Industrial Applications</td>
<td>Edited by Régis Blondeau, ENSM, St-Etienne, France</td>
<td>9781848210387</td>
<td>October 2008</td>
<td>512</td>
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<td>Vapor Surface Treatments</td>
<td>Edited by Alain Galerie, Grenoble INP, France</td>
<td>9781848211711</td>
<td>November 2009</td>
<td>416</td>
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<td>Plastic Forming Processes</td>
<td>Maurice Reyne, Consultant, France</td>
<td>9781848210660</td>
<td>November 2008</td>
<td>288</td>
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<td>Structural Components</td>
<td>Edited by Dominique François, Ecole Centrale de Paris, France</td>
<td>9781848210158</td>
<td>August 2008</td>
<td>344</td>
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<td>Materials and Surface Engineering in Tribology</td>
<td>Jamal Takadoum, ENSMM, Besançon, France</td>
<td>9781848210677</td>
<td>November 2008</td>
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# Scientific Committee

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## Scientific and Technical Topics

*(non-exhaustive list)*

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<td>Logic and Foundations</td>
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## Forthcoming Titles and Sets

ISTE catalog May 2014  
— 97 —
Forthcoming Titles

Accelerated Lifetime Testing by Bagdonavičus Viljandas, Nikulin Mikhail
Applications of Combinatorial Optimization by Paschos Vangelis Th
Branching Random Walks in Non-homogeneous Environments by Yarovaya Elena
Concepts of Combinatorial Optimization by Paschos Vangelis Th
Contagion Phenomena by Gourieroux Christian, Darolles Serge
Distributions of Goodness-of-Fit Statistics by Martynov Gennady
Finance Mathematics by Mishura Yuliya
Heavy Tail Loss Distributions by Cooke Roger M., Nieboer Daan, Misiewicz Jolanta
Insurance Mathematics by Gatto Riccardo
Integral and Measure by Mackevičius Vigirdas
Maintenance Models by Gaudoin Olivier et al.
Mathematical Basis for Finance by Gushchin Alexander A.
Paradigms of Combinatorial Optimization by Paschos Vangelis Th
PDMP in Reliability by Dufour François et al.
Portfolio Optimization with Different Information Flow by Hillairet Caroline, Jiao Ying
Practical Guide to Risk-Based investing by Jurczenko Emmanuel, Teiletche Jérôme
Probability Theory for Signal Processing by Sintes Christophe, Pastor Dominique
Risk Parity Guide by Jurczenko Emmanuel, Teiletche Jérôme
Statistical inference in Financial and Insurance with R by Brouste Alexandre
Statistical Modeling in Clinical Trials by Anisimov Vladimir, Fedorov Valerii
Stochastic Methods for Life Insurance by Devolder Pierre, Janssen Jacques, Manca Raimondo
Stochastic Methods for Non Life Insurance by Devolder Pierre, Janssen Jacques, Manca Raimondo

Forthcoming Sets

- Mathematical Models and Methods in Reliability coordinated by Nikolaos Limnios, Bo Henry Lindqvist
- Optimization in Insurance and Finance coordinated by Mishura Yuliya and Nikolaos Limnios
- Quantitative Finance coordinated by Patrick Duvaut and Emmanuelle Jay
- Statistical Methods for Seismes coordinated by Nikolaos Limnios, Eleftheria Papadimitriou, George Tsaklidis
- Stochastic Models in Insurance coordinated by Jacques Janssen
This book deals with Markov chains on denumerable state spaces, with particular emphasis on birth and death processes as well as the transient analysis of several queuing systems using uniformization. The theory of denumerable Markov chains is detailed, both in discrete and continuous time. In continuous time, the authors carefully examine the explosion phenomenon and the Kolmogorov equations, and apply these results to birth-and-death processes.

Contents

1. Discrete-Time Markov Chains.
2. Continuous-Time Markov Chains.
4. Uniformization.
5. Queues.

Mathematical Statistics and Stochastic Processes is based on decision theory and asymptotic statistics and contains up-to-date information on the relevant topics of theory of probability, estimation, confidence intervals, non-parametric statistics and robustness, second-order processes in discrete and continuous time and diffusion processes, statistics for discrete and continuous time processes, statistical prediction, and complements in probability.

Contents

Part 1. Mathematical Statistics
1. Introduction to Mathematical Statistics.
5. Point Estimation.
8. Non-Parametric Methods and Robustness.
Part 2. Statistics for Stochastic Processes
10. Weakly Stationary Discrete-Time Processes.
13. Stochastic Integration and Diffusion Processes.
14. ARMA Processes.
15. Prediction.
Part 3. Supplement

This title brings together contributions by specialists in statistical theory as they discuss their applications providing up-to-date developments in methods used in survival analysis, statistical goodness of fit, stochastic processes for system reliability, amongst others. Many of these are related to the work of Professor M. Nikulin in statistics over the past 30 years.

Contents

Part 1. Statistical Models and Methods
1. Unidimensionality, Agreement and Concordance Probability.
2. A Universal Goodness-of-Fit Test Based on Regression Techniques.
7. Within the Sample Comparison of Prediction Performance of Models and Submodels: Application to Alzheimer’s Disease.
10. On Testing Stochastic Dominance by Exceedance, Precedence and Other Distribution-Free Tests, with Applications.
17. Kernel Estimation of Density from Indirect Observation.
19. A Non-Parametric Test for Comparing Treatments with Missing Data and Dependent Censoring.
Part 3. Reliability and Maintenance
23. A New Goodness-of-Fit Test for Shape-Scale Families.
Rasch Models in Health
Edited by Karl Bang Christensen and Svend Kreiner, University of Copenhagen, Denmark and Mounir Mesbah, UPMC, Paris, France

The family of statistical models known as Rasch models started with a simple model for responses to questions in educational tests presented together with a number of related models that the Danish mathematician Georg Rasch referred to as models for measurement. Since the beginning of the 1950s the use of Rasch models has grown and has spread from education to the measurement of health status. This book contains a comprehensive overview of the statistical theory of Rasch models.

Part 1 contains the probabilistic definition of Rasch models, Part 2 describes the estimation of item and person parameters, Part 3 concerns the assessment of the data-model fit of Rasch models, Part 4 contains applications of Rasch models, Part 5 discusses how to develop health-related instruments for Rasch models, and Part 6 describes how to perform Rasch analysis and document results.

Contents

Part 1. Probabilistic Models
1. The Rasch Model for Dichotomous Items.
2. Rasch Models for Ordered Polytomous Items.
Part 2. Inference in the Rasch Model
3. Estimation of Item Parameters.
Part 3. Checking the Rasch Model
5. Item Fit Statistics.
6. Overall Tests of the Rasch Model.
7. Local Dependence.
8. Two Tests of Local Independence.
Part 4. Applying the Rasch Model
11. A Multidimensional Latent Class Rasch Model for the Assessment of the Health-Related Quality of Life.
13. From Measurement to Analysis.
Part 5. Creating, Translating and Improving Rasch Scales
17. Improving Items That Do Not Fit the Rasch Model.
Part 6. Analyzing and Reporting Rasch Models
19. Reporting a Rasch Analysis.

Applied Diffusion Processes from Engineering to Finance
Jacques Janssen, Solvay Business School, Brussels, Oronzio Manca, Seconda Università degli Studi di Napoli, Aversa and Raimondo Manca, La Sapienza University, Rome, Italy

The authors point out the strict inter-relations that exist among the diffusion models used in engineering, finance and insurance. In each of the three fields, the basic diffusion models are presented and their strong similarities are discussed.

Contents

1. Diffusion Phenomena and Models.
4. Problems in Finance.
5. Basic PDE in Finance.
10. Lévy Processes.

Stochastic Methods for Pension Funds
Pierre Devolder, Université catholique de Louvain, Jacques Janssen, Solvay Business School, Brussels, Belgium and Raimondo Manca, La Sapienza University, Rome, Italy

The book presents all the stochastic models that can be used for the study of pension schemes and the management of pension funds. Advanced stochastic tools are used for the construction of the models presented.

Contents

1. Introduction: Pensions in Perspective.
2. Classical Actuarial Theory of Pension Funding.
5. Fair and Market Values and Interest Rate Stochastic Models.
6. Risk Modeling and Solvency for Pension Funds.
7. Optimal Control of a Defined Benefit Pension Scheme.
8. Optimal Control of a Defined Contribution Pension Scheme.
10. Discrete Time Semi-Markov Processes (SMP) and Reward SMP.
Appendix 2. Itô Calculus and Diffusion Processes.
Managerial Logic
Hervé Raynaud, Sigmund Freud Universität, Vienna, Austria in collaboration with Kenneth J. Arrow, Stanford University, USA

This book places the managerial logic in a phenomenological framework and shows how the influence of traditional methods has slowed the effective resolution of these problems.

Contents

Part 1. A Paradoxical Research Field
1. The Initial Problem.
2. Paradoxes.

Part 2. A Central Case: The Majority Method
4. Intuition Can Easily Suggest Errors.
5. Would Transitivity be a Prohibitive Luxury?

Part 3. Axiomatizing Choice Functions
7. An Important Class of Choice Functions.
8. Prudent Choice Functions.
10. Coherent Choice Functions.
11. Rationality and Independence.
12. Monotonic Choice Functions.

Part 4. Multicriterion Ranking Functions
15. Coherent Condorcet Rankings.

Introduction to Stochastic Analysis
INTEGRALS AND DIFFERENTIAL EQUATIONS
Vigirdas Mackevicius, Vilnius University, Lithuania

This is an introduction to stochastic integration and stochastic differential equations including exercises with hints and/or solutions.

Contents

1. Introduction: Basic Notions of Probability Theory.
2. Brownian Motion.
3. Stochastic Models with Brownian Motion and White Noise.
4. Stochastic Integral with Respect to Brownian Motion.
5. Itô’s Formula.
7. Itô Processes.
8. Stratonovich Integral and Equations.
10. Solutions of SDEs as Markov Diffusion Processes.
11. Examples.

Progress in Combinatorial Optimization • ISCO2010
Edited by A. Ridha Mahjoub, LAMSADE, University Paris-Dauphine, France

This book presents recent developments and new trends in Combinatorial Optimization. The topics include, among others, complexity analysis, exact and heuristic methods, cutting-plane techniques, approximations algorithms, computational complexity and network design algorithms.

Combinatorial Optimization is an active research area that has applications in many domains such as communications, network design, VLSI, scheduling, production and computational biology. In recent years, new results and major advances have been seen in many areas including computational complexity, approximation algorithms, cutting-plane-based methods and submodularity function minimization. More efficient and powerful methods have been developed for approaching real-world problems, and new concepts and theoretical results have been introduced. This book presents a collection of chapters surveying some of these advances.

Contents

5. Relax-and-Cut as a Preprocessor and Warm Starter to Branch-and-Cut.
7. On a Time-Dependent Formulation and an Updated Classification of ATSP Formulations.
11. Combinatorial Optimization Methods to Determine the Rank of a Matrix over a Communicative Ring, with Engineering Applications.
12. Robust Routing in Communication Networks.
13. Single Machine Scheduling with a Common Due Date: Total Weighted Tardiness Problems.
15. An Introduction to Exponential Time Exact Algorithms for Solving NP-hard Problems.
16. Moderately Exponential Approximation.
17. Progress in Semidefinite Optimization Techniques for Satisfiability.
19. Using Extended MIP Formulations for a Production/Sequencing and a Production/Distribution Problem.
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Scientific and Technical Topics
(non-exhaustive list)

Beam Mechanics
Bifurcation
Composite Materials
Continuum Damage Mechanics
Continuum Micromechanics
Dynamics
Elasticity
Finite Element Method
Fracture Mechanics
Gradient Mechanics
Homogenization
Mechanics of Materials
Meshfree Methods
Nanomechanics

Non-smooth Systems
Nonlinear Mechanics
Non-local Mechanics
Plasticity
Plate and Shell Modeling
Poromechanics
Probabilistic Mechanics
Rheology
Stability
Structural Mechanics
Thermodynamics
Viscoelasticity
Viscoplasticity

Forthcoming Titles and Sets
Forthcoming Titles

Anisotropic Behavior of Polycrystals by Kondo Djimédo, Abdul-Latif Akrum
Arch Buckling by Bradford M.A.
Asymptotic Methods in Mechanics by Ballard Patrick et al.
Asymptotic Theory for Structures by Marigo Jean-Jacques
Calculation Methods in Transient Dynamics by Combescure Alain et al.
Constrained Motion in Mechanical Systems by Udwadia F.E.
Continuum Mechanics and Linear Elasticity by Coman C
Dimensional Analysis and Similarity Theory in Applied Mechanics and Heat Transfer by Milisavlevich Branko
Dynamic Stiffness Method by Banerjee J.R.
Finite Strain Continuum Mechanics and Stability Problems by Attard M, Kellermann D
Forming and Micro-forming of Small-size Metal Materials by Hug Eric, Keller Clement
Galilean Mechanics and Thermodynamics of Continua by de Saxcé Géry, Vallée Claude
Generalized Beam Theory by Camotim D
Heat Transfers in Polymer Composite Materials by Boyard Nicolas
Homogeneization and Periodic Structures by Sab Karam, Lebée Arthur
Instabilities and Buckling by Combescure Alain et al.
Interface Modeling and Multi-scale Approaches by Cherkaoui Mohammed et al.
Lie Geometry / Mechanical Applications by Lerbet J, Chevalier D
Micromechanics, Continuum Damage Mechanics and Fracture Mechanics by Kondo Djimédo, Dormieux Luc
Multiscale Analysis of Rods Suspensions by Chinesta Francesco et al.
Nanomechanics by Murmu Tony
Non-local Structural Mechanics by Murmu Tony, Adhikari Sondipon, McCarthy Michael
Nonlinear Beam and Cable Mechanics in Engineering Applications by Luongo Angelo, Zulli Daniele
Nonlinear Dynamics Stability by Kounadis A
Structural Stability of Columns, Plates and Shells by Iyengar N.G.R.
Sustainable Masonry by Ciblac Thierry, Morel Jean-Claude
The Rayleigh-Ritz Method for Structural Analysis by Ilanko Sinniah

Forthcoming Sets

- Micromechanics coordinated by Djimédo Kondo
This fully updated and revised 3rd edition addresses the entire field of mechanical vibration and shock as one of the most important types of load and stress applied to structures, machines and components in the real world. Examples include everything from the regular and predictable loads applied to turbines, motors or helicopters by the spinning of their constituent parts to the ability of buildings to withstand damage from wind loads or explosions, and the need for cars to maintain structural integrity in the event of a crash. There are detailed examinations of underlying theory, models developed for specific applications, performance of materials under test conditions and in real-world settings, and case studies and discussions of how the relationships between these affect design for actual products.

Invaluable to engineers specializing in mechanical, aeronautical, civil, electrical and transportation engineering, this reference work, in five volumes is a crucial resource for the solution of shock and vibration problems.

### Sinusoidal Vibration

**Volume 1**

March 2014 • 448 pages • USD 195.00

ISBN: 9781848216440 • Title co-published with Wiley

The relative and absolute response of a mechanical system with a single degree of freedom is considered for an arbitrary excitation, and its transfer function is defined in various forms. The characteristics of sinusoidal vibration are examined in the context both of the real world and of laboratory tests, and for both transient and steady state response of the one-degree-of-freedom system. Viscous damping and then non-linear damping are considered. The various types of swept sine perturbations and their properties are described and, for the one-degree-of-freedom system, the consequence of an inappropriate choice of sweep rate are considered. From the latter, rules governing the choice of suitable sweep rates are then developed.

**Contents**

1. The Need.
2. Basic Mechanics.
4. Impulse and Step Responses.
5. Sinusoidal Vibration.
7. Non-viscous Damping.
8. Swept Sine.

### Mechanical Shock

**Volume 2**

March 2014 • 464 pages • USD 195.00

ISBN: 9781848216457 • Title co-published with Wiley

This volume considers the shock response spectrum, its various definitions, its properties, and the assumptions involved in its calculation. In developing the practical application of these concepts, the shock shapes or profiles most often used with test facilities are presented, together with their characteristics and indications of how to establish test configurations comparable with those in the real-world, measured environment.

Following this analysis is a casestudy of how to meets specifications using standard laboratory equipment, shock machines, electrodynamic exciters driven by a time signal or a response spectrum. Discussion of the limitations, advantages and disadvantages of each method is presented.

**Contents**

1. Shock Analysis.
5. Kinematics of Simple Shocks.
9. Simulation of Pyroshocks.
The vast majority of vibrations encountered in a real-world environment are random in nature. Such vibrations are intrinsically complicated, but this volume describes the process enabling the simplification of the analysis required, and the analysis of the signal in the frequency domain. Power spectrum density is also defined, with the requisite precautions to be taken in its calculation together with the processes (windowing, overlapping) necessary for improved results. A further complementary method, the analysis of statistical properties of the time signal, is described. This enables the distribution law of the maxima of a random Gaussian signal to be determined, and simplifies the calculation of fatigue damage to be made by avoiding the direct counting of peaks.

**Contents**

3. RMS Value of Random Vibration.
7. Statistics of Extreme Values.
10. First Passage at a Given Level of Response of a One-degree-of-freedom Linear System to a Random Vibration.

Fatigue damage in a system with one degree of freedom is one of the two criteria applied when comparing the severity of vibratory environments. The same criterion is also employed for a specification representing the effects produced by the set of vibrations imposed in a real-world environment. In this volume, which is devoted to the calculation of fatigue damage, the author explores the various hypotheses and models used to describe the behavior of material suffering fatigue and the laws of fatigue accumulation. The author also considers the methods of counting response peaks, which are used to establish a histogram when it is not possible to use the probability density of the peaks obtained with a Gaussian signal. The expressions for mean damage and its standard deviation are established and other hypotheses are tested.

**Contents**

2. Accumulation of Fatigue Damage.
4. Fatigue Damage by One-degree-of-freedom Mechanical System.
5. Standard Deviation of Fatigue Damage.
6. Fatigue Damage using other Assumptions for Calculation.
7. Low Cycle Fatigue.

This volume focuses on specification development in accordance with the principle of tailoring. Extreme response and the fatigue damage spectra are defined for each type of stress (sinusoidal vibration, swept sine, shock, random vibration, etc.).

The process for establishing a specification from the life cycle profile of equipment which will be subject to these types of stresses is then detailed. The analysis takes into account the uncertainty factor, designed to cover uncertainties related to the real-world environment and mechanical strength, and the test factor, which takes account of the number of tests performed to demonstrate the resistance of the equipment.

**Contents**

3. Fatigue Damage Spectrum of a Sinusoidal Vibration.
5. Fatigue Damage Spectrum of a Shock.
6. Influence of Calculation: Conditions of E.R.S.s and F.D.S.s
7. Tests and Standards.
8. Uncertainty Factor.
10. Test Factor.
This book contains mathematical preliminaries in which basic definitions of fractional derivatives and spaces are presented. The central part of the book contains various applications in classical mechanics including fields such as: viscoelasticity, heat conduction, wave propagation and variational Hamilton–type principles. Mathematical rigor will be observed in the applications.

The authors provide some problems formulated in the classical setting and some in the distributional setting. The solutions to these problems are presented in analytical form and these solutions are then analyzed numerically. Theorems on the existence of solutions will be presented for all examples discussed. In using various constitutive equations the restrictions following from the second law of thermodynamics will be implemented. Finally, the physical implications of obtained solutions will be discussed in detail.

Contents

Part 1. Mathematical Preliminaries, Definitions and Properties of Fractional Integrals and Derivatives
1. Mathematical Preliminaries.
2. Basic Definitions and Properties of Fractional Integrals and Derivatives.
Part 2. Mechanical Systems
4. Vibrations with Fractional Dissipation.
7. Fractional Heat Conduction Equations.

Mechanics and Uncertainty

Maurice Lemaire, French Institute for Advanced Mechanics, Clermont-Ferrand, France

The aim of this book is to encourage reflection on scientific advances relating to mechanical design in an uncertain context, and to introduce the main tools used by engineers to justify their innovations and demonstrate an acceptable balance between performance, robustness and reliability. It highlights advances in the domain, whilst also identifying areas where conceptual progress still needs to be made.

Contents

1. Understanding Uncertainty.
3. Decision Support under Uncertainty.
Materials and Structures under Shock and Impact
Patrice Bailly, Ecole nationale supérieure d’ingénieurs de Bourges, France

November 2013 • 336 pages • USD 145.00
ISBN: 9781848216518 • Title co-published with Wiley

This book presents a didactic approach starting with the theoretical elements of the mechanics of materials and structures, in order to develop their applications in the cases of shocks and impacts. The latter are studied on a local scale at first. They lead to stresses and strains in the form of waves propagating through the material, this movement then extending to the whole of the structure.

Contents
Part 1. Dynamics of Solids
1. Motion within Solids.
3. Waves and Shocks in a Nonlinear Medium.
Part 2. Dynamic of Structures
7. Explosions and Blasts.
8. Mechanical Response of Beams.
9. Responses of Multiple Degree of Freedom Structures.

Mathematical Models of Beam and Cables
Angelo Luongo and Daniele Zulli, University of L’Aquila, Italy

October 2013 • 384 pages • USD 175.00
ISBN: 9781848216518 • Title co-published with Wiley

The authors of this book present an overview of the broad field of the mechanics of one-dimensional structures. The authors formulate nonlinear models of elastic and visco-elastic one-dimensional continuous structures (beams and cables), and also deal with several models of increasing complexity.

Contents
1. A One-Dimensional Beam Metamodel.
2. Straight Beams.
3. Curved Beams.
4. Internally Constrained Beams.
5. Flexible Cables.
7. Locally-Deformable Thin-Walled Beams.
8. Distortion-Constrained Thin-Walled Beams.

Structural Dynamic Analysis with Generalized Damping Models
Sondipon Adhikari, Swansea University, Wales

These two volumes are the first comprehensive study to cover vibration problems with general non-viscous damping. The author draws on his considerable research experience to produce a text covering: parametric sensitivity of damped systems; identification of viscous damping; identification of non-viscous damping; and some tools for the quantification of damping. The book is written from a vibration theory standpoint, with numerous worked examples which are relevant across a wide range of mechanical, aerospace and structural engineering applications.

Volume 1: Description

Contents
1. Introduction to Damping Models and Analysis Methods.
2. Dynamics of Undamped and Viscously Damped Systems.
5. Linear Systems with General Non-Viscous Damping.

Volume 2: Identification

Contents
2. Identification of Viscous Damping.
3. Identification of Non-viscous Damping.
4. Quantification of Damping.
Fracture Mechanics, in 3 volumes
by Ammar Grous
CEGEP de l'Outaouais, Gatineau, Quebec, Canada

Fracture Mechanics is subdivided into three volumes: the first volume presents the majority of the laws of statistical distributions as well as their specific characteristics. The second volume covers the analysis of adjustment tests suited to correctly validating the justified use of the laws conforming to the behavior of the materials and structures under study. The third volume adds a pragmatic and supportive character to the previous volumes by focusing on case studies using corrected exercises that readers will find extremely useful.

Volume 1 • Analysis of Reliability and Quality Control
December 2012 • 272 pages • USD 95.00
ISBN: 9781848214408 • Title co-published with Wiley

Contents
1. Elements of Analysis of Reliability and Quality Control.
2. Estimates, Testing Adjustments and Testing the Adequacy of Statistical Distributions.

Volume 2 • Applied Reliability
December 2012 • 368 pages • USD 145.00
ISBN: 9781848214415 • Title co-published with Wiley

Contents
1. Fracture Mechanisms by Fatigue.
3. Analysis of the Reliability of Materials and Structures by the Bayesian Approach.
5. Reliability Indices.
6. Fracture Criteria Reliability Methods through an Integral Damage Indicator.
7. Monte Carlo Simulation.

Volume 3 • Applied Quality Control
December 2012 • 288 pages • USD 125.00
ISBN: 9781848214422 • Title co-published with Wiley

Contents
1. Quality Control.
2. Quality Control Case Studies.
3. Case Studies.
Non-smooth Deterministic or Stochastic Discrete Dynamical Systems
APPLICATIONS TO MODELS WITH FRICTION OR IMPACT
Jérôme Bastien, University Lyon 1, Frédéric Bernardin, CETE Lyon and Claude-Henri Lamarque, ENTPE, Vaulx-en-Velin, France
February 2013 • 512 pages • USD 195.00
ISBN: 9781848215252 • Title co-published with Wiley

This book contains theoretical and application-oriented methods to treat models of dynamical systems involving non-smooth nonlinearities.

Contents
1. Some Simple Examples.
2. Theoretical Deterministic Context.
5. Systems with Friction.
7. Applications—Extensions.

Fracture Mechanics and Crack Growth
Naman Recho, Blaise Pascal University Clermont II, France
February 2012 • 512 pages • USD 247.00
ISBN: 9781848213067 • Title co-published with Wiley

Fracture Mechanics and Crack Growth presents recent advances related to the following two topics:
– how mechanical fields close to material or geometrical singularities such as cracks can be determined;
– how failure criteria can be established according to the singularity degrees related to these discontinuities.

Contents
1. Introduction.
   Part 1. Stress Field Analysis Close to the Crack Tip
5. Introduction to the Finite Element Analysis of Cracked Structures.
   Part 2. Crack Growth Criteria
6. Crack Propagation
7. Crack Growth Prediction in Elements of Steel Structures Submitted to Fatigue.

Mechanical Engineering Education
Edited by J. Paulo Davim, University of Aveiro, Portugal
October 2012 • 192 pages • USD 95.00
ISBN: 9781848213814 • Title co-published with Wiley

This title covers mechanical engineering higher education with a particular emphasis on quality assurance and the improvement of academic institutions, mechatronics education and the transfer of knowledge between university and industry.

Contents
1. Quality Assurance in Greek HEIs: Convergence or Divergence with European Models?
2. Mechatronics Education.

Full-Field Measurements and Identification in Solid Mechanics
Edited by Michel Grédiac and François Hild
November 2012 • 496 pages • USD 195.00
ISBN: 9781848212947 • Title co-published with Wiley

This timely book presents cutting-edge developments by experts in the field on the rapidly developing and scientifically challenging area of full-field measurement techniques used in solid mechanics – including photoelasticity, grid methods, deflectometry, holography, speckle interferometry and digital image correlation. The evaluation of strains and the use of the measurements in subsequent parameter identification techniques to determine material properties are also presented.

Contents
1. Basics of Metrology and Introduction to Techniques.
2. Photoelasticity.
5. Elementary Speckle Interferometry.
7. From Displacement to Strain.
8. Introduction to Identification Methods.
11. The Virtual Fields Method.
13. Reciprocity Gap Method.
15. From Microstructure to Constitutive Laws.
This book specifically develops instabilities arising from the rotor–structure coupling, instability of control systems, the self-sustained instabilities associated with the presence of internal damping and instabilities related to the fluid–structure coupling for fixed and rotating structures.

Contents

1. Notions of Instability.

Carbon Nanotubes and Nanosensors
VIBRATIONS, BUCKLING AND BALLISTIC IMPACT

Authors

Isaac Elishakoff, Florida Atlantic University, USA, Demetris Pentaras, The Cyprus University of Technology, Cyprus, Kevin Dujat and Simon Busas, IFMA – French Institute for Advanced Mechanics, France, Claudia Versaci and Giuseppe Muscolino, University of Messina, Italy, Joel Storch, Touro College, USA, Noël Challamel, University of South Brittany, France, Toshiaki Natsuki, Shinshu University, Japan, Yingyan Zhang, University of Western Sydney, Australia, Chien Ming Wang, National University of Singapore, Singapore, Guillaume Ghyselinck, Ecole des Mines d’Alès, France

This title is dedicated to the vibration, buckling and impact behavior of carbon nanotubes (CNTs), along with theory for carbon nanosensors, like the Bubnov-Galerkin and the Petrov-Galerkin methods, the Bresse-Timoshenko and the Donnell shell theory.

Contents

1. Introduction.
2. Fundamental Natural Frequencies of Double-walled Carbon Nanotubes.
4. Exact Solution for Natural Frequencies of Clamped-clamped Double-walled Carbon Nanotubes.
5. Natural Frequencies of Carbon Nanotubes Based on a Consistent Version of Bresse-Timoshenko Theory.
7. Buckling of a Double-walled Carbon Nanotube.
12. Summary and Directions for Future Research.

Mechanics of Solid Interfaces
Edited by Muriel Braccini, CNRS and Michel Dupeux, Joseph Fourier University, Grenoble, France

The various topics discussed here are the mechanical characterization of interfaces, the initiation and growth of cracks along interfaces, the origin and control of interface adhesion, focusing in particular on thin films on substrate systems. It is designed and structured to provide a solid background in the mechanics of heterogeneous materials to help students in materials science, as well as scientists and engineers.

Contents

Part 1. Fundamentals
1. Interfaces: the Physics, Chemistry and Mechanics of Heterogeneous Continua.
2. Structure and Defects of Crystalline Interfaces.
3. Singularities and Interfacial Cracks.
4. Interface Adherence.
5. Controlling Adherence.
7. Shock Mechanics and Interfaces.
8. Thin Films.

An Introduction to Chemical Kinetics
Michel Soustelle, Ecole des Mines, Saint-Etienne, France

This book provides complete coverage of the domain of chemical kinetics.

Contents

Part 1. Basic Concepts of Chemical Kinetics
2. Reaction Mechanisms and Elementary Steps.
4. Kinetic Data Acquisition.
7. Pseudo- and Quasi-steady State Modes.
8. Modes with Rate-determining Steps.
9. Establishment and Resolution of a Reaction Mechanism.
12. The Kinetics of Chain Reactions.
13. Catalysis and Catalyzed Reactions.
15. Kinetics of Non-pseudo-steady State Modes.
Appendix 1. Point Defects and Structure Elements of Solids.
Appendix 2. Notions of Microscopic Thermodynamics.
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<th>Title</th>
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<td>Multidisciplinary Design Optimization in Computational Mechanics</td>
<td>Edited by Piotr Breitkopf and Rajan Filomeno Coelho, UTC, France</td>
<td>9781848211384 • May 2010 • 576 pages • USD 215.00</td>
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<td>X-ray Diffraction by Polycrystalline Materials</td>
<td>René Guinebretière, ENS de Céramiques Industrielles, Limoges, France</td>
<td>9781905209217 • March 2007 • 376 pages • USD 215.00</td>
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<td>Tomasz Krysinski, Eurocopter and François Malburet, ENSAM, Aix-en-Provence, France</td>
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<td>Dynamics of Structures</td>
<td>Patrick Paultre, University of Sherbrooke, Canada</td>
<td>9781848210639 • October 2010 • 816 pages • USD 205.00</td>
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<td>Biotribology</td>
<td>Edited by J. Paulo Davim, University of Aveiro, Portugal</td>
<td>9781848212756 • July 2010 • 224 pages • USD 102.00</td>
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<tr>
<td>Structural Reliability</td>
<td>Maurice Lemaire, French Institute for Advanced Mechanics, Clermont-Ferrand, France</td>
<td>9781848210820 • March 2009 • 512 pages • USD 250.00</td>
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<tr>
<td>Handbook of Heterogenous Kinetics</td>
<td>Michel Soustelle, Ecole des Mines, Saint-Étienne, France</td>
<td>9781848211001 • March 2010 • 960 pages • USD 325.00</td>
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<td>Solid Mechanics using the Finite Element Method</td>
<td>Alain Berlioz, Toulouse University and Philippe Trompette, Consultant, France</td>
<td>9781848211919 • November 2009 • 336 pages • USD 140.00</td>
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<td>Structural Dynamics in Industry</td>
<td>Alain Girard and Nicolas Roy, Intespace, France</td>
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MOLECULAR, GREEN, MEDICAL
AND PHARMACOLOGICAL CHEMISTRY

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Scientific and Technical Topics
(non-exhaustive list)

Chemistry for Sustainable Development
Alternative Solvents
Atom Economy Processes
Chemistry in Water
Chemistry without Solvents and Solutions
Functional Ionic Liquid Mediated Synthesis
Green Solvents
No-waste or Low-waste Chemical Processes

Novel Synthetic Methodologies towards Sustainability
Biomass Conversion

Cascade Reaction or Tandem Reaction or Domino Reaction
Catalytic Processes
(Organocatalysis, Organometallic Catalysis, Photoredox-catalysis)
Chemistry of Natural and Biologically Active Compounds
Click Chemistry
Green Synthesis
Multicomponent Reactions
Photochemistry
Radical Chemistry
Sustainable Development in the Process Industries

Forthcoming Titles

Anticancer Drugs: Navelbine® and Taxotère® by Muriel Le Roux, Françoise Gueritte

Forthcoming Sets

- Ecotoxicology coordinated by André Mariotti
- Green Chemistry and Organo Catalysts coordinated by Géraldine Masson, Max Malacria
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Scientific and Technical Topics
(non-exhaustive list)

Analysis of Nanosystems
Environmental Aspects of Nanotechnology
General Nanotechnology
Nanobiology
Nanobiotechnology
Nanocharacterization
Nanochemistry
Nanoinformatics
Nanomaterials
Nanomedicine
Nanophysics
Nanotechnology Products
Nanotoxicology
Nanosystems
Production of Nanosystems
Safety Aspects of Nanotechnology
Synthesis of Nanosystems

Forthcoming Titles and Sets
Forthcoming Titles

Carbon Nanotubes Growth by Boulanger Pascal et al.
Electrostatic Kinetic Energy Harvesters by Basset Philippe, Blokhin Elena, Galayko Dimitri
Embedded System Security by Tria Assia
Micro, Nano and Optoelectronics Components and Systems by Leray Jean-Luc, Gaillard Rémi
Multilayer Coatings from Nano to Micro by Poulon Angéline
Nano Electro Mechanical Systems by Hentz Sébastien
Nano-thermites by Lafontaine Eric, Comet Marc
Nanostructured Reactive Material by Rossi Carole
Nanotechnologies for Synthetic Super Non-wetting Surfaces by Senez Vincent, Thomy Vincent, Dufour Renaud
Piezoelectric Nanostructures for Energy Applications by Ardila Gustavo, Montes Laurent, Mouis Mireille
Piezoelectric ZnO Nanostructure for Energy Harvesting by Leprince-Wang Yamin
Quantum Transport in Nanodevices by Triozon François, Dollfus Philippe
Swift Ion Beam Analysis in Nanosciences by Jalabert Denis, Vickridge Ian
Transport Simulation in Nanodevices by Triozon François, Dollfus Philippe

Forthcoming Sets

- Biological and Chemical Detection coordinated by Pascal Maigné
- Microgeneration coordinated by Pascal Maigné
- Nanotechnologies for Energy Recovery coordinated by Pascal Maigné
- Textiles Functionalization for Dual Applications coordinated by Pascal Maigné
Beyond CMOS Nanodevices
Edited by Francis Balestra,
INP-Minatec, Grenoble, France
in two volumes
Beyond CMOS Nanodevices focuses on the interest of
nanostructures and nanodevices (nanowires, small slope
switches, 2D layers, nanostructured materials, etc.) for
advanced More than Moore (RF-nanosensors-energy
harvesters, on-chip electronic cooling, etc.) and Beyond-
CMOS logic and memory applications.
These two books provide a detailed review of the most
recent advances in these fields which have gained a
strong momentum for many applications.

Beyond CMOS Nanodevices 1
April 2014 • 528 pages • USD 185.00
ISBN: 9781848216549 • Title co-published with Wiley
Contents
Part 1. Silicon Nanowire Biochemical Sensors
  1. Fabrication of Nanowires.
  2. Functionalization of Si-Based NW FETs for
     DNA Detection.
  4. Integration of Silicon Nanowires with CMOS.
  5. Portable, Integrated Lock-in-Amplifier-Based System for Real-
     Time Impedimetric Measurements on Nanowires Biosensors.
Part 2. New Materials, Devices and Technologies for Energy
Harvesting
Part 3. On-chip Electronic Cooling
  11. Silicon-Based Cooling Elements.
  12. Thermal Isolation through Nanostructuring.
Part 4. New Materials, Devices and Technologies for RF
applications
  13. Substrate Technologies for Silicon-integrated RF and
      mm-wave Passive Devices.
  14. Metal Nanolines and Antennas for RF and mm-wave
      Applications.
  15. Nanostructured Magnetic Materials for High-Frequency
      Applications.

Beyond CMOS Nanodevices 2
April 2014 • 160 pages • USD 90.00
ISBN: 9781848216556 • Title co-published with Wiley
Contents
  3. Graphene and 2D Layer Devices for More
     Moore and More-Than-Moore Applications.

Nanoscale Microwave Engineering
OPTICAL CONTROL OF NANODEVICES
Charlotte Tripon-Canseliet, University Pierre and Marie Curie, Paris, Jean Chazelas, Thales Defence Mission Systems Division, France
February 2014 • 144 pages • USD 70.00
ISBN: 9781848215870 • Title co-published with Wiley
Nanoscale Microwave Engineering targets new trends in microwave
engineering by downscaling components and devices for industrial
purposes such as miniaturization and function densification, in
association with the new approach of activation by a confined optical
remote control.
It covers the fundamental groundwork of the structure, property,
characterization methods and applications of 1D and 2D
nanostructures, along with providing the necessary knowledge of
atomic structure, how it relates to the material band-structure and
how this in turn leads to the amazing properties of these structures.
It thus provides new graduates and post-doctorates with a resource
equipping them with the knowledge to undertake their research. The
purpose of this book is to give readers the elements required to enter
the world of nano-architects for microwave nanosystems.
The first chapter is dedicated to nanotechnology-based materials for
ultrafast microwave applications and their interactions with light,
before moving on to an exploration of EM material characterization
at nanoscale in Chapter 2. The third chapter is devoted to
nanotechnology-based components and devices, reviewing existing
components and a stateoftheart with these technologies (active).
Chapter 4 focuses on the engineering of new optically controlled
microwave functions based on 2D and 1D semiconductor materials.
Finally, the conclusion draws on various perspectives of this new
field of optically controlled low dimensionality materials.

Contents
  1. Nanotechnology-based Materials and their Interaction with
     Light.
  2. Electromagnetic Material Characterization at Nanoscale.
  3. Nanotechnology-based Components and Devices.

NANOSCIENCE AND NANOTECHNOLOGY
**NANOSCIENCE AND NANOTECHNOLOGY**

**Nanotechnologies**
*Concepts, Processing and Applications*
Pierre Camille Lacaze, Paris Diderot University, France

November 2012 • 304 pages • USD 125.00
ISBN: 9781848214385 • Title co-published with Wiley

*Nanotechnologies* details how successive discoveries of new nanocarbon structures along with progress in different microscopy techniques have caused nanomaterials to take on an increasingly important role in electronics, electrochemical energy storage – batteries and fuel cells – and the electrical conversion of solar energy.

**Contents**
3. Nanomaterials in All Their Forms: New Properties Due to the Confinement of Matter.
4. Some Amazing Properties of Nanomaterials and of Their Assembly into Networks.
Part 2. Applications and Societal Implications of Nanotechnology

**Micro-and Nanoelectromechanical Biosensors**
Liviu Nicu and Thierry Leichlé, LAAS-CNRS, Toulouse, France

December 2013 • 144 pages • USD 75.00
ISBN: 9781848214798 • Title co-published with Wiley

The authors of this book shed light upon the field of microelectromechanical system (MEMS) based biosensors and provide a contemporary snapshot of the miniaturized biosensors landscape without neglecting the seminal references or products where needed.

The chapters cover the main transduction methods for biosensing amenable to miniaturization, the different types of bioreceptors and the associated grafting methods that confer biosensitivity to solid surfaces, the technological tools available to achieve the specific and localized biofunctionalization of the sensor surface, and the advantages offered by further device miniaturization from MEMS to nanoelectromechanical (NEMS) biosensors in terms of performances and integration capabilities, along with the associated challenges inherent to the realization of nanoscale biosensors.

**Contents**
1. Transduction Techniques for Miniaturized Biosensors.
2. Bioreceptors and Grafting Methods.
3. Patterning Techniques for the Biofunctionalization of MEMS.
4. From MEMS to NEMS Biosensors.
5. Comparing Performances of Biosensors: Impossible Mission?

**Transmission Electron Microscopy in Micro-nanoelectronics**
Edited by Alain Claverie, CEMES, Toulouse, France

December 2012 • 272 pages • USD 145.00
ISBN: 9781848213678 • Title co-published with Wiley

This book presents in a simple and practical way the new quantitative techniques based on TEM which have recently been invented or developed to address most of the main challenging issues scientists and process engineers have to face to develop or optimize semiconductor layers and devices. After a brief presentation of the underlying theory, each technique is illustrated through examples from the lab or fab.

**Contents**
1. Active Dopant Profiling in the TEM by Off-Axis Electron Holography.
6. Interdiffusion and Chemical Reaction at Interfaces by TEM/EELS.

**Energy Autonomous Micro and Nano Systems**
Edited by Marc Belleville and Cyril Condemine, CEA-LETI, MINATEC, Grenoble, France

June 2012 • 400 pages • USD 165.00
ISBN: 9781848213579 • Title co-published with Wiley

This book details the challenges and latest techniques available to readers who are interested in this field. A major strength of this book is that the first three chapters are application orientated and thus, by setting the landscape, introduce the technical chapters. There is also a good balance between the technical application, covering all the system-related aspects and, within each chapter, details on the physics, materials and technologies associated with electronics.

**Contents**
1. Sensors at the Core of Building Control.
2. Toward Energy Autonomous Medical Implants.
7. Lithium Micro-Batteries.
NANOSCIENCE AND NANOTECHNOLOGY

Backlist Titles
(full details can be found on www.iste.co.uk)

Micro, Nanosystems and Systems on Chips
MODELING, CONTROL AND ESTIMATION
Edited by Alina Voda, Grenoble University, France
9781848211902 • January 2010 • 328 pages • USD 140.00

Nanomaterials and Surface Engineering
Edited by Jamal Takadoum, ENSMM, Besançon, France
9781848211513 • June 2010 • 384 pages • USD 150.00

An Introduction to Nanoscience and Nanotechnology
Alain Nouailhat, CNRS, Paris, France
9781848210073 • January 2008 • 240 pages • USD 110.00

Nano and Micromachining
Edited by J. Paulo Davim, University of Aveiro, Portugal and Mark J. Jackson, Purdue University, USA
9781848211032 • November 2008 • 224 pages • USD 110.00

Nanoscale CMOS
INNOVATIVE MATERIALS, MODELING AND CHARACTERIZATION
Edited by Francis Balestra, INP-Minatec, Grenoble, France
9781848211803 • June 2010 • 672 pages • USD 245.00

The Wigner Monte-Carlo Method for Nanoelectronic Devices
PARTICLE DESCRIPTION OF QUANTUM TRANSPORT AND DECOHERENCE
Damien Querlioz and Philippe Dollfus, University of Paris-Sud, Orsay, France
9781848211506 • April 2010 • 272 pages • USD 110.00

Electron Transport in Nanostructures and Mesoscopic Devices
Thierry Ouisse, ENSPG, Grenoble, France
9781848210509 • June 2008 • 400 pages • USD 210.00

Nanophotonics
Edited by Hervé Rigneault, Fresnel Institute, Jean-Michel Lourtioz, French network on nanophotonics, Claude Delalande, Former Director of the Laboratoire Pierre Aigrain and Juan Ariel Levenson, Center of Nanosciences of the Paris-Region, France
9781905209286 • June 2006 • 328 pages • USD 165.00
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Scientific and Technical Topics
(non-exhaustive list)

Cloud Networks
Content Delivery Networks
The Digital Firm
Energy Saving in Networks
Home Networks
Internet of Things
Management and Control Systems
Mobile Internet
Mobile Networks

Network Architecture
Network Coding
Network Security
Network Virtualization
Software Defined Networking
Ubiquitous Networks
Use in Networks
Voice and Video over IP
Wireless Networks

Forthcoming Titles and Sets
Forthcoming Titles

Adaptive Distributed Communication in Mobile Systems by Ramanathan Sakkaravarthi et al.
Advanced Networks by Pujolle Guy
Aeronautical Air-Ground Communications by Pirovano Alain, Guerber Christophe, Ben Mahmoud Slim, Larrieu Nicolas, Radzik José
Bandwidth Allocation for Video under Quality of Service Constraints by Anjum Bushra, Perros Harry
Bio-inspired Networking by Camara Daniel
Bio-inspired Routing Protocols for Vehicular Ad-Hoc Networks by Bitam Salim, Mellouk Abdelhamid
Coded Content Distribution in DTN by Albini Fabio, Munaretto Anelise, Fonseca Mauro
Dynamic Wireless Sensor Networks by Oteafy Sharief M.A., Hassanein Hossam S.
Error-Correcting Codes by Carlach Jean-Claude
Green Networking by Rossi Dario et al.
Inter-domain Routing Security by Masip-Bruin Xavier, Yannuzzi Marcelo, Siddiqui Muhammad Shuaib
Internet Metrology by Rossi Dario et al.
Min-plus Algebra Networks by Boyer Marc, Bouillard Anne, Le Corronc Euriell
Mobile-HealthCare / Systems, Networks and Applications by Krief Francine, Mehaoua Ahmed
Multimedia Ontology Driven Architecture for QoS Management in Home Networks by Exposito Ernesto
Network Management and Control by Boutaba Raouf
Network Security by Perez André
New Networks and New Services by Minerva Roberto, Crespi Noël
New Telecom Networks by Battu Daniel
Quality of Experience Engineering for Customer Added Value Services by Mellouk Abdelhamid, Cuadra-Sanchez Antonio
Queuing Theory by Baynat Bruno
Radio Frequency Identification by Perret Etienne
Real-time Systems Scheduling by Chetto Maryline
Satellite and Terrestrial Hybrid Networks by Berthou Pascal
Smart SOA Platforms in Cloud Computing Architectures by Exposito Ernesto, Diop Codé
Telecommunication Networks by Perros Harry, Harfoush Khaled
Virtual Networks and Cloud Networking by Secci Stefano
Will the Telco survive to an ever changing world? by Crespi Noël, Minerva Roberto
Wireless and Mobile Networks by Al Agha Khaldoun

Forthcoming Sets

- Advanced Networks coordinated by Guy Pujolle
- Access and Core Networks coordinated by Abdelhamid Mellouk
- Multimedia Services coordinated by Abdelhamid Mellouk
- Wireless Sensor Networks coordinated by Abdelhamid Mellouk
**Resource Optimization and Security for Cloud Services**
Kaiqi Xiong, Rochester Institute of Technology, USA

January 2014 • 208 pages • USD 110.00
ISBN: 9781848215993 • Title co-published with Wiley

Resource Optimization and Security for Cloud Services covers the current state of the art in this field. It includes a study of trustworthiness, percentile response time, service availability, and network authentication for cloud services.

The first part of the book gives an analysis of percentile response time, which is one of the most important service level agreement (SLA) metrics. With the number of e-business applications dramatically increasing, SLA will play an important part in distributed and cloud service computing. An SLA is a combination of several Quality of Service (QoS) metrics, such as security, performance and availability, agreed upon between a customer and a service provider. Effective and accurate numerical solutions for the calculation of the percentile response time in single-class and multi-class queuing networks are presented. Then, the numerical solution is incorporated into a resource allocation problem. In the second part of the book, the author extends the approach to considering trustworthiness, service availability, and the percentile of response time in Web services. Finally, the third part presents a thorough performance evaluation of two notable public cryptography-based authentication techniques.

**Contents**

1. Introduction.
4. Multiple-Class Customers.
5. A Trustworthy Service Model.
7. Summary and Future Work.

**Quantum Networking**
Rodney Van Meter, Keio University, Fujisawa, Japan

April 2014 • 368 pages • USD 145.00
ISBN: 9781848215375 • Title co-published with Wiley

This book consists of four parts, flowing from background material to the applications of quantum networking, then taking the reader to the leading edge of current research on chaining quantum repeaters together to enable end-to-end quantum communication, before finishing with complex quantum networks consisting of many nodes connected in rich topologies.

**Contents**

1. Overview.  
Part 1. Fundamentals  
2. Quantum Background.  
3. Networking Background.  
4. Teleportation.  
Part 2. Applications  
5. Quantum Key Distribution.  
7. Entangled States as Reference Frames.  
Part 3. Lines of Repeaters  
10. Purification and Entanglement Swapping-Based Repeaters  
11. Quantum Error Correction-Based Repeaters.  
12. Finessing the Key Limitations.  
Part 4. Networks of Repeaters  
15. Quantum Recursive Network Architecture.  

**Advanced Routing Protocols for Wireless Networks**
Miguel Elias M. Campista, Marcelo G. Rubinstein, Federal University of Rio de Janeiro, Brazil

May 2014 • 154 pages • USD 70.00
ISBN: 9781848216273 • Title co-published with Wiley

The authors review physical medium characteristics and the main underlying access methods, before moving on to introduce the main metrics and protocols used for routing in ad hoc, mesh, vehicular, sensor, and delay-tolerant networks. Throughout the book the main differences between approaches are discussed.

**Contents**

1. Wireless Networking Basic Aspects.  
3. Ad Hoc Routing.  
5. Vehicular Routing.  
7. Delay- and Disruption-Tolerant Network Routing.

**VBR Video Traffic Models**
Savera Tanwir and Harry Perros, North Carolina State University, USA

March 2014 • 160 pages • USD 75.00
ISBN: 9781848216365 • Title co-published with Wiley

A plethora of VBR video traffic models have been proposed in the last two decades, the majority of which have not previously been surveyed or evaluated.

In this book, the authors provide a comprehensive survey and comparison of these video traffic models for different types of videos. Moreover, they evaluate different models and present the results, greatly benefiting students and researchers in the field of video analysis and modeling, as well as network engineers looking to generate synthetic video traffic to benchmark their network.

**Contents**

1. Video Coding.  
2. Video Traffic Modeling.  
Virtual Networks
PLURALISTIC APPROACH FOR THE NEXT GENERATION OF INTERNET
Edited by Otto Carlos M.B. Duarte, Universidade Federal do Rio de Janeiro, Brazil and Guy Pujolle, UPMC, Paris, France
May 2013 • 272 pages • USD 95.00
ISBN: 9781848215672 • Title co-published with Wiley

The first chapter of this title concerns virtualization techniques that allow sharing computational resources basically, slicing a real computational environment into virtual computational environments that are isolated from one another.

The Xen and OpenFlow virtualization platforms are then presented in Chapter 2 and a performance analysis of both is provided. Interfaces for system management of the two platforms are proposed in Chapter 3. The book then moves on to survey existing control algorithms for virtual networking.

Contents
1. Virtualization.
2. Virtual Network Interfaces.
3. Performance Improvement and Control of Virtual Network Elements.
5. Providing Isolation and Quality-of-Service to Virtual Networks.
6. Piloting System.

Geopositioning and Mobility
Edited by Ahmed Nait-Sidi-Moh, University of Picardie Jules Verne, France, Mohamed Bakhouya, Aalto University, Finland, Jaafar Gaber and Maxime Wack, UTBM, Belfort, France
July 2013 • 320 pages • USD 125.00
ISBN: 9781848214064 • Title co-published with Wiley

This book focuses on the uses of services, applications and usages of geopositioning in general and GNSS, especially in the field of mobile and land transport, of automotive and tourism (by foot, with two wheels, by car, with professional vehicles or by collective transport, etc.).

Geopositioning and Mobility explores the many possibilities, development and organization factors and new paradigms which will contribute to an essential part of the civil economy of GNSS, especially of Galileo mid-term and of Egnos in the short-term.

Several structuring aspects of integration of GNSS in sustainable terrestrial mobilities are analyzed, for example in terms of system architecture, of data safety or of legal constraints.

Contents
1. The Geopositioning Concept.
2. Functions and Performance of the Egnos System.
5. Location-based Services: Platforms and Applications.
7. Pedestrian Navigation for the Benefit of Mobility.

Quality of Experience for Multimedia
APPLICATION TO CONTENT DELIVERY NETWORK ARCHITECTURE
Abdelhamid Mellouk and Said Hoceini, University of Paris-Est (UPEC), France and Hai Anh Tran, Hanoi University of Science and Technology (HUST), Vietnam
October 2013 • 176 pages • USD 80.00
ISBN: 9781848215634 • Title co-published with Wiley

The authors of this book focus on the idea of how to integrate the Quality of Experience (QoE) into a control-command chain in order to construct an adaptive network system.

Contents
1. Network Control Based on Smart Communication Paradigm.
2. Quality of Experience.
3. Content Distribution Network.

Voice over LTE
EPS AND IMS NETWORKS
André Perez, Consultant, France
August 2013 • 256 pages • USD 95.00
ISBN: 9781848215344 • Title co-published with Wiley

Voice over LTE (Long Term Evolution) presents the mechanisms put in place in 4G mobile networks for the transportation of IP packets containing voice data and telephone signaling, as well as the technologies used to provide a telephone service in the IMS (IP Multimedia Sub-system) network.

Contents
1. The EPS Network.
2. The LTE Interface.
3. The CSFB Function.
4. SIP and SDP Protocols.
5. The IMS Network.
6. Telephone Services.
7. The SRVCC Function.

LTE-Advanced DRX
Mechanism for Power Saving
Scott A. Fowler and Naomi Yamada, Linköping University, Sweden and Abdelhamid Mellouk, UPEC, France
August 2013 • 128 pages • USD 65.00
ISBN: 9781848215320 • Title co-published with Wiley

By introducing the basics of mathematical analysis and performance evaluation of power-saving mechanisms in 3rd generation partnership project (3GPP) LTE and LTE-Advanced networks, the authors of this book describe novel algorithms which could have better performance capabilities than previous methods.

Contents
1. Basic Theory.
3. Other Approaches for LTE Power Saving.
Risk Propagation Assessment for Network Security

APPLICATION TO AIRPORT COMMUNICATION NETWORK DESIGN

Mohamed Slim Ben Mahmoud, Nicolas Larrieu and Alain Pirovano, ENAC, French National Institution for Civil Aviation, France

This book describes models and/or algorithms designed to investigate evolutionary solutions to overcome important issues such as congestion control, routing, clustering, inter-connection with long-term evolution (LTE) and LTE advanced cellular networks, traffic signal control and analysis of performances through simulation tools and the generation of vehicular mobility traces for network simulations.

Contents

4. Complementarity between Vehicular Networks and LTE Networks.
5. Gateway Selection Algorithms in Vehicular Networks.

Information-Centric Networks

A NEW PARADIGM FOR THE INTERNET

Gabriel M. Brito, Pedro Braconnor Velloso and Igor M. Moraes, Universidade Federal Fluminense, Brazil

Information-Centric Networks (ICNs) are a new communication paradigm to increase the efficiency of content delivery as well as content availability. In this new concept, the network infrastructure actively contributes to content caching and distribution. This book presents the basic concepts of ICNs, describes the main architecture proposals for these networks, and discusses the main challenges for its development. The challenges include naming, routing and caching on the network-core elements as well as several aspects of content security, user privacy and practical issues to implement ICNs.

Contents

1. Content Distribution on the Internet.
2. Information-Centric Networks.
3. Main ICN Architectures.
4. Challenges.
5. Practical Issues.

Vehicular Networks

MODELS AND ALGORITHMS

Edited by André-Luc Beylot, ENSEEIHT, IRIT, Toulouse and Houda Labiod, Telecom ParisTech, France

This book describes models and/or algorithms designed to investigate evolutionary solutions to overcome important issues such as congestion control, routing, clustering, inter-connection with long-term evolution (LTE) and LTE advanced cellular networks, traffic signal control and analysis of performances through simulation tools and the generation of vehicular mobility traces for network simulations.

Contents

4. Complementarity between Vehicular Networks and LTE Networks.
5. Gateway Selection Algorithms in Vehicular Networks.
This book reviews all the threats weighing on these remote access points, as well as the existing standards and specific countermeasures to protect companies, from both the technical and organizational points of view. It also reminds us that the organization of safety is a key element in the implementation of an efficient system of countermeasures as well. The authors also discuss the novelty of BYOD, its dangers and how to face them.

Contents
1. An Ordinary Day in the Life of Mr. Rowley or the Dangers of Virtualization and Mobility.
2. Threats and Attacks.
3. Technological Countermeasures.
5. What Should Have Been Done to Make Sure Mr Rowley’s Day Really Was Ordinary.

The work presented in this book proposes a model-driven methodology and a service-oriented approach aimed at designing the mechanisms, functions, protocols and services of the next generation transport layer.

Contents
1. Introduction.
4. Model-Driven Design Methodology of Transport Mechanisms and Functions.
7. Specification and Validation of QoS-Oriented Transport Mechanisms and Functions.

A detailed overview on service architecture in the Telco, Web and IT worlds is presented, offering a roadmap with explanations on how to improve the architecture and governance of communication service architectures by exploiting the syntax and semantics that are common to different services is clearly outlined.

This book also responds to recurring questions about service design, such as the functional scope of enablers or SOA (Service Oriented Architecture) services, the relevance of service composition to the user and collaboration between different services in a converged environment. Many concrete examples from telecoms service providers’ operations illustrate these concepts.

Contents
1. Describing Service Architectures.
2. Convergence of Service.
4. Modeling and Case Study.
5. Organizational and Software Applications.
Energy Efficiency in Wireless Networks
Oswald Jumira, South Africa and Sherali Zeadally, University of the District of Columbia, USA

This book presents state-of-the-art energy-efficient techniques, designs and implementations that pertain to wireless communication networks such as cellular networks, wireless local area networks (WLANs) and wireless Ad Hoc networks (WAHNs) including mobile Ad Hoc networks (MANETs), and wireless sensor networks (WSNs) as they are deployed across the world to facilitate “always on” reliable high-speed wireless access from anywhere, at anytime to accommodate the new paradigm of the “Internet of Things” (IoT).

The pervasive and exponential growth of Wi-Fi and the impact of bandwidth-intensive applications on the energy consumption of Wi-Fi-enabled devices are discussed along with energy harvesting as an advantageous option to power WAHNs.

Contents
5. Future Challenges and Opportunities.

Green Networking
Edited by Francine Krief, Institut Polytechnique de Bordeaux, France

Recent advances and future directions in green networking are presented in this book, including energy efficient networks (wired networks, wireless networks, mobile networks), adaptive networks (cognitive radio networks, green autonomic networking), green terminals, and industrial research into green networking (smart city, etc.).

Contents
1. Environmental Impact of Networking Infrastructures.
6. Autonomic Green Networks.
8. Research Projects on Green Networking Conducted by Industrial Actors.

Intelligent Video Surveillance Systems
Jean-Yves Dufour, Thales DSC Division, France

This book highlights the operational attempts of video analytics, to identify possible driving forces behind potential evolutions in years to come, and above all to present the state of the art and the technological hurdles which have yet to be overcome.

Contents
1. Image Processing: Overview and Perspectives.
2. Focus on Railway Transport.
3. A Posteriori Analysis for Investigative Purposes.
5. Video Compression Formats.
7. Detection of Objects of Interest.
8. Tracking of Objects of Interest in a Sequence of Images.
9. Tracking Objects of Interest Through a Camera Network.
14. Data Mining in a Video Database.
15. Analysis of Crowded Scenes in Video.
17. Example of an Operational Evaluation Platform: PPSL.
18. Qualification and Evaluation of Performances.

Wireless Optical Communications
Edited by Olivier Bouchet, France Telecom, France

This book looks at the free space optics that are already used for the exchange of current information; its many benefits, such as incorporating channel properties, propagation models, link budgets, data processing including coding, modulation, standards and concerns around health and safety (IEC 60825 or FCC - Class 1 for example.

Contents
1. Light.
2. History of Optical Telecommunications.
4. Propagation Model.
5. Propagation in the Atmosphere.
6. Indoor Optic Link Budget.
8. Optics and Optronics.
10. Data Transmission.
11. Installation and System Engineering.
12. Conclusion.
**Stochastic Modeling and Analysis of Telecom Networks**
Laurent Decreusefond, Télécom ParisTech and Pascal Moyal, University of Technology of Compiègne, France

This book addresses the stochastic modeling of telecommunication networks, introducing the main mathematical tools for that purpose, such as Markov processes, real and spatial point processes and stochastic recursions, and presenting a wide list of results on stability, performances and comparison of systems.

The authors propose a comprehensive mathematical construction of the foundations of stochastic network theory: Markov chains, continuous time Markov chains are extensively studied using an original martingale-based approach. A complete presentation of stochastic recursions from an ergodic theoretical perspective is also provided, as well as spatial point processes.

**Contents**
1. Introduction.
   Part 1. Discrete-time Modeling
   2. Stochastic Recursive Sequences.
   4. Stationary Queues.
   5. The M/GI/1 Queue.
   Part 2. Continuous-time Modeling
   8. Systems with Delay.
   Part 3. Spatial Modeling
   10. Spatial Point Processes.

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**Network Coding**
Edited by Khaldoun Al Agha, University of Paris XI, France

*Network coding* delivers an understanding of network coding and provides a set of studies showing the improvements in security, capacity and performance of fixed and mobile networks. This is increasingly topical as industry is increasingly becoming more reliant upon and applying network coding in multiple applications. Many cases where network coding is used in routing, physical layer, security, flooding, error correction, optimization and relaying are given – all of which are key areas of interest.

**Contents**
1. Network Coding: From Theory to Practice.
2. Fountain Codes and Network Coding for WSNs.
8. Robust Network Coding.

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**Mobile Networks Architecture**
André Perez, Consultant, France

This book explains the evolutions of architecture for mobiles and summarizes the different technologies 2G, 3G, HSDPA (High Speed Downlink Packet Access), HSUPA (High Speed Uplink Packet Access), HSPA+, and 4G. The telephone service and data transmission are the two main services provided by these networks. The evolutions are fundamentally dictated by the increase in the rate of data transmission across the radio interface between the network and mobiles.

**Contents**
1. The GSM Network.
2. The GPRS Network.
3. The UMTS Network.
4. The NGN.
5. The EPS Network.
6. The IMS Network.

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**Digital Home Networking**
Edited by Romain Carbou, Orange Labs, LAAS-CNRS, Toulouse, France and Rodrigo Roman, University of Malaga, Spain

*Digital Home Networking*, in light of several years of applied research and technological surveys, describes the digital home networking environment, its techniques, and the challenges around its service architecture.

It provides a broad introduction to state-of-the-art digital home standards and protocols, as well as an in-depth description of service architectures for entertainment and domotic services involving digital home resources. The book covers aspects such as networking, remote access, security, interoperability, scalability and Quality of Service. Notably, it describes the generic architecture, which was proposed and developed in the context of the EUREKA/Celtic research project "Feel®Home".

**Contents**
1. Introduction.
4. Standards.
5. Personalization and Home Context.
7. Quality of Experience and Quality of Service.
8. Service Management.
10. Home Interconnection through the Internet.
11. Conclusion.
Network Performance Analysis

Thomas Bonald, Telecom ParisTech and Mathieu Feuillet, INRIA, France

September 2011 • 272 pages • USD 127.00
ISBN: 9781848213128 • Title co-published with Wiley

Network Performance Analysis introduces the main results of queuing theory that are useful for analyzing the performance of these systems. These mathematical tools are key to the development of robust dimensioning rules and engineering methods. A number of examples illustrate their practical interest.

Contents

1. Introduction.
2. Exponential Distribution.
5. Markov Processes.
6. Queues.
7. Queuing Networks.

Compact Antennas for Wireless Communications and Terminals

Edited by Jean-Marc Laheurte, University of Paris-Est, Marne-La-Vallée, France

June 2011 • 272 pages • USD 127.00
ISBN: 9781848213074 • Title co-published with Wiley

Compact Antennas for Wireless Communications and Terminals deals with compact microwave antennas and, more specifically, with the planar version of these antennas. Planar antennas are the most appropriate type of antenna in modern communication systems and more generally in all applications requiring miniaturization, integration and conformation such as in mobile phone handsets.

Contents

1. General Information about Printed Antennas.
2. Transmission Line Model.
3. Cavity Model.
4. Radiation of a Printed Antenna.
5. Electrical Equivalent Circuit of a Printed Antenna.
8. Wideband Antennas.
11. Introduction to Antenna Diversity.

RFID and the Internet of Things

Edited by Hervé Chabanne, Morpho, Pascal Urien, Telecom ParisTech and Jean-Ferdinand Susini, CNAM, France

June 2011 • 304 pages • USD 127.00
ISBN: 9781848212985 • Title co-published with Wiley

This book describes the techniques used for RFID (Radio Frequency Identification): hardware, communication protocols, cryptography, applications (including EPC) and middleware. It provides a detailed description of all the elements making up an RFID system today. Some hot topics such as the respect of privacy and the Internet of Things are also covered.

Contents

Part 1. Physics of RFID
1. Introduction.
3. RFID Communication Modes.
4. RFID Applications
5. Cryptography of RFID
6. EPCglobal
Part 2. Middleware
7. Middleware for the Internet of Things: Principles.
8. Middleware for the Internet of Things: Standards.

Communicating Systems with UML 2

David Garduno Barrera, Consultant and Michel Diaz, LAAS/CNRS, Toulouse, France

June 2011 • 288 pages • USD 127.00
ISBN: 9781848212992 • Title co-published with Wiley

This book gives a practical approach to modeling and analyzing communication protocols using UML 2. Network protocols are always presented with a point of view focusing on partial mechanisms and starting models. It gives the basis needed for anybody to model and validate their own protocols and follows a practical approach and gives many examples for the description and analysis of well known basic network mechanisms for protocols.

Contents

1. Why Use UML to Model Network Protocols?
2. Simple Transmission.
The field of Home Area Networks (HAN) is fast becoming the next frontier in the communications business. This book describes the various technologies involved in the implementation of HAN: connections to high-speed Internet, indoor implementations, services, software and management packages; and also the multimedia applications with a detailed description of IPTV technology.

It highlights the main technologies used for HAN: information transmission by means of copper pairs, coaxial cables, fiber optics and radio systems as well as software systems necessary for the processing and management of communications. These technologies apply to multimedia, remote healthcare, remote working, energy and device management in the home.

**Contents**

1. Services Offered by Home Area Networks.
2. Receiving Television via Internet: IPTV.
3. Household Internet Connections.
5. Software Structure used in Home Area Networks.
7. Service Platforms.

This collective work provides engineers, researchers and radio designers with the necessary information from mathematical analysis and hardware architectures to design methodology and tools, running platforms and standardization in order to understand this new cognitive radio domain.

**Contents**

1. Introduction to Cognitive Radio.
6. Software Radio as Support Technology
7. Introduction to Software Radio.
8. Transmitter/Receiver Analog Front End.
10. Processing of Nonlinearities.
11. Methodology and Tools.
12. General Conclusion and Perspectives.

This book provides details of the key Quality of Service (QoS) technologies deployed in telecommunications networks: Ethernet, Internet Protocol (IP), and Multiprotocol Label Switching (MPLS). The QoS of the network is made up of two parts: fault management and resource management.

**Contents**

1. Network Operation.
2. Characterizing Quality of Service.
4. Implementing Operation Quality.
8. MPLS Technology – Fault Management.

Local Networks and the Internet examines the technologies most commonly used in the Internet and in local intranets, in their design and development. It explains the relationships between the various important standards, as well as their objectives and their technical content.

**Contents**

1. Introduction.
2. Standardization and Wiring.
3. Internet and IEEE 802.3 Protocols.
4. The LLC and SNAP Sublayers.
5. Interconnection by Bridges: The Spanning Tree Algorithm.
6. Internet.
7. IP Protocols.
8. Level 4 Protocols: TCP, UDP and SCTP.
13. Virtual Local Networks.
15. IP on Point-to-Point Links: PPP.
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<th>Title</th>
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<th>Pages</th>
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<td>Ad Hoc Networks</td>
<td>Mounir Frikha, SUPCOM, Tunisia</td>
<td>9781848212275</td>
<td>December 2010</td>
<td>288</td>
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<td>The Internet of Things</td>
<td>Hakima Chaouchi, TELECOM SudParis, France</td>
<td>9781848211407</td>
<td>May 2010</td>
<td>288</td>
<td>USD 102.00</td>
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<td>Communicating Embedded Systems</td>
<td>Francine Krief, University of Bordeaux, France</td>
<td>97818482111445</td>
<td>January 2010</td>
<td>352</td>
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<td>Network Applications</td>
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<td>Radio Resources Management in WiMAX</td>
<td>Emmanuelle Vivier, ISEP, France</td>
<td>9781848210691</td>
<td>March 2009</td>
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<td>From Theoretical Capacity to System Simulations</td>
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<td>Autonomic Networks</td>
<td>Dominique Gaïti, University of Technology of Troyes, France</td>
<td>9781848210028</td>
<td>January 2008</td>
<td>344</td>
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<td>The Radio Spectrum</td>
<td>Jean-Marc Chaduc, ANF and Gérard Pogorel, ENST Paris, France</td>
<td>9781848210066</td>
<td>January 2008</td>
<td>320</td>
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<td>Management, Control and Evolution of IP Networks</td>
<td>Guy Pujolle, LIP6, University of Paris 6, France</td>
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<td>March 2007</td>
<td>674</td>
<td>USD 330.00</td>
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<td>UMTS</td>
<td>Javier Sanchez, LG Electronics Mobilecomm France and Mamadou Thioune, STMicroelectronics, France</td>
<td>9781905209712</td>
<td>January 2007</td>
<td>440</td>
<td>USD 215.00</td>
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<td>Wireless and Mobile Network Security</td>
<td>Hakima Chaouchi and Maryline Laurent-Maknavicius, TELECOM SudParis, France</td>
<td>9781848211179</td>
<td>June 2009</td>
<td>704</td>
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<td>Fiber-Optic Communications</td>
<td>Pierre Lecoy, Ecole Centrale de Paris, France</td>
<td>9781848210493</td>
<td>August 2008</td>
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<td>USD 165.00</td>
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<td>Ultra-Wideband Radio Propagation Channels</td>
<td>Pascal Pagani, France Telecom R&amp;D, Friedman Tchoffo, Talom, Satimo, Patrice Pajuasco, Consultant and Bernard Uguen, University of Rennes 1, France</td>
<td>9781848210844</td>
<td>November 2008</td>
<td>240</td>
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<td>End-to-End Quality of Service Engineering in Next Generation Heterogenous Networks</td>
<td>Abdelhamid Mellouk, University of Paris 12, France</td>
<td>9781848210615</td>
<td>November 2008</td>
<td>480</td>
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<td>Wireless Ad Hoc and Sensor Networks</td>
<td>Houda Labiod, ENST, Paris, France</td>
<td>9781905209435</td>
<td>January 2008</td>
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<td>Multimedia Multicast on the Internet</td>
<td>Abderrahim Benslimane, University of Avignon, France</td>
<td>9781905209422</td>
<td>January 2007</td>
<td>384</td>
<td>USD 260.00</td>
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<td>Reconfigurable Mobile Radio Systems</td>
<td>Guillaume Vivier, Motorola, France</td>
<td>9781905209460</td>
<td>May 2007</td>
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Scientific and Technical Topics
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Biomarkers
Biomedical Signal and Image Analysis
Brain Computer Interface
Brain Connectivity
Cardiac Application
Computational Neurosciences
Electrodes Interfaces
Electrophysiology (EEG EMG ENG)
Functional Modeling
Implant Manufacturing
Magnetoencephalography (Meg)
Motor and Sensory Impairment Rehabilitation
Muscles

Nerve Regrowth, Stem Cells and Neurons
Neural Coding
Neurobotics
Neuromorphic Engineering
Neuroprosthesis
Neurorehabilitation
Neurosurgery
Peripheral Nervous System
Spinal Cord Networks
Statistical Modeling
Stochastic Modeling
Technology Approval Procedure and Legal Framework
Vegetative Function Rehabilitation
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Scientific and Technical Topics

(non-exhaustive list)

Advanced Discretization Methods
Advanced Optimization Techniques
Damage and Fracture of Materials and Structures
Digital Image Correlation
Dynamic Data Driven Application Systems
Image-based Simulation
Integrated Computational Materials Engineering
Inverse Analysis

Multiphysics Coupled Problems
Multiscale Analysis
Numerical Methods for GPU & HPC
Real-time Simulations towards Improved Virtual Reality
Reduced Order Modeling
Simulation-based Control
Stochastic Models and their Simulation

Forthcoming Titles

Hydrodynamic Bearings by Bonneau Dominique, Fatu Aurelian, Souchet Dominique
Internal Combustion Engine Bearings Lubrication in Hydrodynamic Bearings
  by Bonneau Dominique, Fatu Aurelian, Souchet Dominique
Mixed Lubrication in Hydrodynamic Bearings by Bonneau Dominique, Fatu Aurelian, Souchet Dominique
Non-linear Mechanics by Stolz Claude
Reconciliation of Geometry and Perception in Radiation Physics by Beckers Benoit, Beckers Pierre
Thermo-hydrodynamic Lubrication in Hydrodynamic Bearings
  by Bonneau Dominique, Fatu Aurelian, Souchet Dominique
Uncertainty Quantification with Matlab by Souza de Cursi Eduardo
Variational Methods for Engineers with Matlab by Souza de Cursi Eduardo

Forthcoming Sets

● Discrete Element Model and Simulation of Continuous Materials Behavior coordinated by Ivan Iordanoff
The author of this book presents a general, robust, and easy-to-use method that can handle many design parameters efficiently.

Following an introduction, Chapter 1 presents the general concepts of truss layout optimization, starting from topology optimization where structural component sizes and system connectivity are simultaneously optimized. To fully realize the potential of truss layout optimization for the design of lightweight structures, the consideration of geometrical variables is then introduced.

Chapter 2 addresses truss geometry and topology optimization by combining mathematical programming and structural mechanics: the structural properties of the optimal solution are used for devising the novel formulation. To avoid singularities arising in optimal configurations, this approach disaggregates the equilibrium equations and fully integrates their basic elements within the optimization formulation. The resulting tool incorporates elastic and plastic design, stress and displacement constraints, as well as self-weight and multiple loading. The inherent slenderness of lightweight structures requires the study of stability issues.

As a remedy, Chapter 3 proposes a conceptually simple but efficient method to include local and nodal stability constraints in the formulation. Several numerical examples illustrate the impact of stability considerations on the optimal design.

Finally, the investigation on realistic design problems in Chapter 4 confirms the practical applicability of the proposed method. It is shown how we can generate a range of optimal designs by varying design settings.

Contents
1. Truss Layout Optimization.
2. Unified Formulation.
This book discusses new techniques for the simulation of cracks in complex conditions required for industrial applications. The level sets method makes it possible to simulate the presence and evolution of a crack with a complex shape. The extended finite element method (X-FEM) uses a priori knowledge on the problem to resolve it, and makes it possible to take into account the presence of a crack without remeshing.

The non-linearity of the material behavior is simulated by an extended law of elastic-plastic behavior for the X-FEM element. The extended finite elements also allow us to perfectly control the energy exchanges, which is of benefit for crack simulation in fragile media or in dynamics.

Contents
2. Representation of Fixed and Moving Discontinuities.
3. Extended Finite Element Method X-FEM.
5. Applications: Numerical Simulation of Crack Growth.

This book offers an in-depth presentation of the finite element method, aimed at engineers, students and researchers in applied sciences. The description of the method is presented in such a way as to be usable in any domain of application. The level of mathematical expertise required is limited to differential and matrix calculus.

The various stages necessary for the implementation of the method are clearly identified, with a chapter given over to each one: approximation, construction of the integral forms, matrix organization, solution of the algebraic systems and architecture of programs. The final chapter lays the foundations for a general program, written in Matlab, which can be used to solve problems that are linear or otherwise, stationary or transient, presented in relation to applications stemming from the domains of structural mechanics, fluid mechanics and heat transfer.

Contents
1. Introduction.
2. Basics of the Natural Element Method.
5. A Mixed Approach to the Natural Elements.
7. Conclusion.

This book covers all the basic ingredients of contact and computational contact mechanics: from efficient contact detection algorithms and classical optimization methods to new developments in contact kinematics and resolution schemes for both sequential and parallel computer architectures. The book is self-contained and intended for people working on the implementation and improvement of contact algorithms in a finite element software.

Using a new tensor algebra, the authors introduce some original notions in contact kinematics and extend the classical formulation of contact elements. Some classical and new resolution methods for contact problems and associated ready-to-implement expressions are provided.

Contents
1. Introduction to Computational Contact.
2. Geometry in Contact Mechanics.
3. Contact Detection.
4. Formulation of Contact Problems.
### Numerical Methods in Engineering

**Backlist Titles**

*(full details can be found on www.iste.co.uk)*

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<th>Title</th>
<th>Editor(s)</th>
<th>ISBN</th>
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<tr>
<td><strong>Finite Element Method in Manufacturing Processes</strong></td>
<td>Edited by J. Paulo Davim, University of Aveiro, Portugal</td>
<td>9781848212824</td>
<td>January 2011</td>
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<tr>
<td><strong>Modeling and Convexity</strong></td>
<td>Eduardo Souza de Cursi, INSA de Rouen, France and Rubens Sampaio, PUC-Rio, Rio de Janeiro, Brazil</td>
<td>9781848211773</td>
<td>May 2010</td>
<td>528</td>
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<td><strong>Modeling and Dimensioning of Structures</strong></td>
<td>Daniel Gay and Jacques Gambelin, University of Toulouse 3, France</td>
<td>9781848210400</td>
<td>April 2008</td>
<td>736</td>
<td>USD 275.00</td>
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<tr>
<td><strong>Finite Volumes for Complex Applications IV</strong></td>
<td>Edited by Fayssal Benkhaldoun, Driss Ouazar and Said Raghay</td>
<td>9781905209484</td>
<td>August 2005</td>
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<td><strong>Finite Element Simulation of Heat Transfer</strong></td>
<td>Jean-Michel Bergheau, ENISE, St-Etienne and Roland Fortunier, Ecole des Mines, St-Etienne, France</td>
<td>9781848210530</td>
<td>September 2008</td>
<td>288</td>
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<td><strong>Mesh Generation</strong></td>
<td>Pascal Jean Frey, UPMC Paris and Paul-Louis George, INRIA, France</td>
<td>9781848210295</td>
<td>February 2008</td>
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<td><strong>Finite Volumes for Complex Applications V</strong></td>
<td>Edited by Robert Eymard, Paris-Est University and Jean-Marc Hérard, EDF, France</td>
<td>9781848210356</td>
<td>May 2008</td>
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ISTE catalog May 2014
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Scientific and Technical Topics
(non-exhaustive list)

- Algal Blooms
- Anoxic Sea Water
- Bathymetric Chart
- Coastal Geography
- Ecological Forecasting
- Glaciology
- Hydrography
- Hydrology
- Limnology
- Marine Archaeology
- Marine Current Power
- Marine Engineering
- Marine Environment
- Ocean Acidification
- Ocean Circulation Models
- Ocean Colonization
- Ocean Engineering
- Sea Pollution
- Sea Level
- Submarine Topographical Features

Forthcoming Titles and Sets
Forthcoming Titles

- Complexity of the Ocean System by Monaco André, Prouzet Patrick
- Dynamic of Notable Ecosystems by Monaco André, Prouzet Patrick
- Ecological and Biogeographical Division of the World Ocean by Reygondeau Gabriel
- Ecosystem Approach and Environmental Governance of the Adour Basin by Prouzet Patrick, Sébastien Léa
- Environmental Risks and Adaptation by Monaco André, Prouzet Patrick
- Extreme Hydro-meteorological Events by Quevauviller Philippe, Ciavola, Garnier
- Governance of Seas and Oceans by Monaco André, Prouzet Patrick
- Iron Cycle in Oceans by Blain Stéphane
- Marine Coastal and Water Pollutions by Muttin Frédéric
- Marine Resources Development and Economy by Monaco André, Prouzet Patrick
- Metrology in Marine Chemistry by Quevauviller Philippe
- Oceanography Tools by Monaco André, Prouzet Patrick
- Silicon Cycle in Oceans by Quéguiner Bernard
- Vulnerability of the Ocean System by Monaco André, Prouzet Patrick

Forthcoming Sets

- Seas and Oceans coordinated by André Monaco and Patrick Prouzet
The presence of water on Earth is discussed in this book using various theories about its origin as a basis. These theories include a massive degassing of the primitive parent bodies that built our planet as well as a late addition from comets that collided with the Earth’s surface. The extraordinary physico-chemical properties of the water molecules, combined with its abundance and distribution over the Earth’s surface, have contributed to regulating the global climate and favoring species’ evolution for more than 4 billion years. The early emergence of life in the deep ocean and its further diversification were closely linked to the global water cycle whose dynamics result from the energy balance between solar radiation and the internal heat flux of the Earth.

Chapter 1 of this book deals with the extraordinary physico-chemical properties of the water molecule while Chapter 2 provides insight on theories regarding the origin of water on Earth. In the third chapter, the author focuses on the chemical composition of the main water reservoirs of our planet. Chapters 4 and 5 discuss water’s relationship with plate tectonics and life, respectively. The sixth and final chapter uses stable isotope tracking to look into the water cycle and past climates.

Contents
2. Theories about the Origin of Water on Earth.
3. The Main Water Reservoirs on Earth and their Chemical Composition.
5. Water and Life.
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Scientific and Technical Topics
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- Crisis and Emergency Management
- Human Factors and Human Reliability
- Maintenance Modeling and Optimization
- Prognosis and System Health Management
- Quantitative Risk Assessment
- Reliability and Safety (Analysis, Mathematical Methods, Data Collection and Analysis)
- Risk and Hazard Analysis
- Risk and Society
- Safety Culture and Occupational Safety

Forthcoming Titles

Modeling with Graphs and Finite State Automata by Aubry Jean-François, Brinzei Nicolae

Forthcoming Sets

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Scientific and Technical Topics
(non-exhaustive list)

Advanced Architectures for Robot Control and Planning Control
Ethics and Robotics
Human-Robot Interaction and Interfaces, Human-Centric Robotics
Humanoid Robots
Innovative Design of Mechanical and Mechatronics Architectures
Medical Robotics
Military Robotics and Civil Security
Multi-Scale Manipulation and Grasping
Neuro-Robotics
Perception

Personal Robots and Education
Personal Service Robot, Entertainment, Surveillance and Education, Robotics for Frail People
Robotics in Industry, Manufacturing and Flexible Automation
Robotics in Unstructured and Dedicated Environments (Nuclear, Offshore, Space)
Service Robotics for Professional Agricultural Robotics and Forestry, Construction Systems and Demolition Robotics, Tertiary Service, Medical Systems
Transport and Logistics
Unmanned Autonomous Vehicles – Ground, Sea, Air

Forthcoming Titles

Calibration of Industrial Robot Manipulators by Maurine Patrick
Flexible Robotics

**APPLICATIONS TO MULTISCALE MANIPULATIONS**
Edited by Mathieu Grossard, CEA-LETI, Grenoble, Stéphane Régnier, UPMC, Paris and Nicolas Chaillet, University of Franche-Comté, France

July 2013 • 416 pages • USD 165.00
ISBN: 9781848215207 • Title co-published with Wiley

This book provides an overview of several scientific and technological advances in the practical field of robotic manipulation. The different chapters examine various stages that involve a number of robotic devices, particularly those designed for manipulation tasks characterized by mechanical flexibility.

**Contents**
2. Flexible Structures Representation and Notable Properties in Control.
4. Open-Loop Control Approaches to Compliant Micromanipulators.
5. Mechanical Flexibility and the Design of Versatile and Dexterous Grippers.
6. Flexible Tactile Sensors for Multidigital Dexterous In-hand Manipulation.
7. Flexures for High-Precision Manipulation Robots.
8. Modeling and Motion Control of Serial Robots with Flexible Joints.
10. Robust Control of Robotic Manipulators with Structural Flexibilities.

Intracorporeal Robotics

**FROM MILLISCALE TO NANOSCALE**
Michaël Gauthier and Nicolas Andreff, FEMTO-ST, Besançon, Etienne Dombre, LIRMM, Montpellier, France

February 2014 • 208 pages • USD 99.00
ISBN: 9781848213715 • Title co-published with Wiley

A promising long-term evolution of surgery relies on intracorporeal microrobotics. This book reviews the principles and scientific challenges that have to be tackled to design and control robots able to manipulate objects within the body whose dimensions range from the micrometer scale up to the millimeter scale. Three orders of magnitude are considered by the authors, justified by the class of problems encountered and solutions implemented to manipulate objects and reach targets within the body: millimetric, sub-millimetric in the 10-100 micrometer range, then in the 1-10 micrometer range. The most prominent devices and prototypes of the state of the art are described to illustrate the benefit that can be expected for surgeons and patients. Future prospects toward nanorobotics are discussed.

The introduction discusses the scale effect and the principles of miniaturization as well as the interest in robotic approaches for biomedical applications in both the millimetric and nanometric fields. Chapters 1-3 include a discussion of the physical and methodological principles put into play at the scale considered, a description of the scientific issues regarding robotics and recent scientific results. They also include a presentation of devices from industry or academia which exist in the scale considered, in the fields of intracorporeal millirobotics, intracorporeal microrobotics, and in vitro non-contact mesorobotics.

Finally, the future prospects for biomedical robotics are discussed for the millimetric, micrometric and mesometric scales along the following three lines: prospective applications, scientific prospects, and prospects in miniaturization towards a nanorobotic biomedical reality.

**Contents**
1. Intracorporeal Millirobotics.
2. Intracorporeal Microrobotics.
3. In vitro Non-Contact Mesorobotics.
4. Toward Biomedical Nanorobotics.

Medical Robotics

Edited by Jocelyne Troccaz, CNRS, France

January 2012 • 432 pages • USD 197.00
ISBN: 9781848213340 • Title co-published with Wiley

This book describes the short history of the domain, its specificity and constraints, and mature clinical application areas. It also presents the major approaches in terms of design and control including man—machine interaction modes. A large state of the art is presented and many examples from the literature are included and thoroughly discussed.

It provides both a broad and summary view of this very active domain as well as keys to understanding the evolutions of the domain and to prepare for the future. An insight to clinical evaluation is also proposed, and the book is finished with a chapter on future developments for intra-body robots.

**Contents**
2. Medical Robotics in the Service of the Patient.
3. Inter-operative Sensors and Registration.
4. Augmented Reality.
5. Design of Medical Robots.
8. Tele-manipulation.
In the last decade the development and control of Unmanned Aerial Vehicles (UAVs) has attracted a lot of interest. Both researchers and companies have a growing interest in improving this type of vehicle given their many civilian and military applications.

This book presents the state of the art in the area of UAV Flight Formation. The coordination and robust consensus approaches are presented in detail as well as formation flight control strategies which are validated in experimental platforms. It aims at helping students and academics alike to better understand what coordination and flight formation control can make possible.

Several novel methods are presented:
- controllability and observability of multi-agent systems;
- robust consensus;
- flight formation control;
- stability of formations over noisy networks;
which generate solutions of guaranteed performance for UAV Flight Formation.

Contents
1. Introduction.
2. Theoretical Preliminaries.
3. Multiagent Coordination Strategies.
5. On Adaptive and Robust Controlled Synchronization of Networked Robotic Systems on Strongly Connected Graphs.
6. Modeling and Control of Mini UAV.
7. Flight Formation Control Strategies for Mini UAVs.
8. Formation Based on Potential Functions.
9. Quadrotor Vision-Based Control.
10. Toward Vision-Based Coordination of Quadrotor Platoons.
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Acoustics
Antennas
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Electromagnetism
Electromagnetic Metrology
Lasers
Micro and Nanotechnologies
Optical Communication
Photonics

Propagation
Radar
Radiocommunication
Sensors
Surface Waves
Teledetection
Waves in Medicine
Waves-Matter Interaction
Wireless Power Transfer

Forthcoming Titles and Sets
Forthcoming Titles

Acoustic Waves by Guenneau Sébastien
Communication via Human Waves by Tréheux Michel
COST by Sauleau Ronan
Electro-optics for Non-ionizing Radiation Dosimetry and Bioelectromagnetism by Duvillaret Lionel, Levêque Philippe
Electromagnetic Waves–Humans Interactions by Wiart Joe
Electromagnetics in Marine Environment by Khenchef Ali
Fiber Lasers by Chartier Thierry
Fourth Generation Mobile Communications by Rémy Jean-Gabriel, Letamendia Charlotte
High Speed Indoor Propagation by Siaud Isabelle
MMSE-Based Algorithm for Joint Signal Detection, Channel and Noise Variance Estimation for OFDM Systems by Savaux Vincent, Louét Yves
Noise in Lasers by Besnard Pascal
Optics in Spatial Instruments by Cerrutti-Maori Guy, Otrio Georges
Organic Lasers by Boudrioua Azzedine, Fischer Alexis, Chakaroun Mahmoud
Post-OFDM by Bellanger Maurice, Terré Michel
Recent Advances in Semiconductor Lasers by Grillot Frédéric
RF and Microwave Electromagnetism by Jarry Pierre, Beneat Jacques N
The photon by Besnard Pascal

Forthcoming Sets

- Advanced Lasers coordinated by Pierre-Noël Favennec, Pascal Besnard, Frédérique de Fornel
- Coupled Waves coordinated by Pierre-Noël Favennec, Frédérique de Fornel
- Electromagnetic Environment coordinated by Pierre-Noël Favennec, Frédérique de Fornel
- Metamaterials Applied to Waves coordinated by Frédérique de Fornel, Sébastien Guenneau
- Nano-optics coordinated by Pierre-Noël Favennec and Frédérique de Fornel
Molecular Imaging in Nano MRI

Michael Ting, Criteo, Paris, France

Magnetic resonance imaging (MRI), a non-destructive technique that can produce 2D images or 3D volumes with a typical spatial resolution in the mm range, has enjoyed considerable success in the field of medical imaging. There is interest in non-destructive 3D imaging on a finer scale, in the nm range, since this would open up the possibility of molecular imaging. Being able to determine the structure of molecules would help the development of drugs. Other possible applications include high-density storage and quantum computing.

For nano MRI to fulfill its potential as a 3D imaging technique that can visualize the atomic structure of molecules, it is necessary to consider the reconstruction of sparse images. Many works have leveraged the assumption of sparsity in order to achieve an improved performance that would not otherwise be possible. This book reviews the latest results on molecular imaging for nano MRI.

Chapter 1 introduces Magnetic Resonance Force Microscopy (MRFM), a promising candidate in the quest for achieving MRI on the atomic scale. Chapter 2 introduces the topic of sparse image reconstruction, and briefly reviews the literature. Algorithms developed with molecular image reconstruction in mind are presented in Chapters 3 to 5. Finally, a simulation study is conducted in Chapter 6 to compare the reconstruction algorithms.

Contents

1. Nano MRI.
3. Iterative Thresholding Methods.
4. Hyperparameter Selection Using the SURE Criterion.

Dispersion Engineering for Integrated Nanophotonics

Olivier Vanbésien, University of Lille and Institute of Electronics, Micro-electronics and Nanotechnology, Villeneuve d’Ascq, Emmanuel Centeno, Blaise Pascal University, Clermont-Ferrand, France

Dispersion engineering in regular and graded photonic crystals to promote anomalous refraction effects are studied by the authors of this book, from the basic concepts to experimental demonstration via nanofabrication considerations.

Self-collimation, ultra- and negative refraction, second harmonic generation, mirage and invisibility effects, which lead to an unprecedented control of light propagation at the (sub-) wavelength scale for the field of integrated nanophotonics, are detailed and commented upon.

Contents

1. Two-Dimensional Dielectric Photonic Crystals.
2. Flat Lenses.
3. Towards Transform Optics Based Devices.

Acoustic Particle Velocity Measurements using Lasers

PRINCIPLES, SIGNAL PROCESSING AND APPLICATIONS

Jean-Christophe Valière, University of Poitiers, France

This book concerns the presentation of particle velocity measurement for acoustics using lasers, including Laser Doppler Velocimetry (LDV or Anemometry (LDA)) and Particle Image Velocimetry (PIV).

The author presents the importance of measuring acoustic velocity, particularly when acoustics is nonlinear, as well as characterizing the near fields. However, these applications need to use non-invasive sensors. Some optical techniques, initially developed for fluid mechanics, have been adapted to the field of acoustics in recent years. This book summarizes 15 years of research in this area, highlighting the improvements that have been made, particularly in signal processing, and showing applications for which they have proven to be innovative.

Contents

2. Some Topics on Signal Processing.
3. LDV for Acoustics.
4. PIV for Acoustics.

UHF RFID Technologies for Identification and Traceability

Jean-Marc Laheurte, University of Paris-Est Marne-La-Vallée, Christian Ripoll, ESIEE, Dominique Paret, dp-Consulting, Christophe Loussert, TAGS, France

UHF Radio Frequency Identification (RFID) is an electronic tagging technology that allows an object, place or person to be automatically identified at a distance without a direct line-of-sight using a radio-wave exchange.

A reference document on the tag antenna design and chip technologies in UHF RFID, UHF RFID Technologies for Identification and Traceability also includes perspectives on end-users, market and production.

Contents

1. Design and Performances of UHF Tag Integrated Circuits.
2. Design of UHF RFID Tags.
3. The Backscattering Technique and Its Application.
4. RFID Markets.
Recent advancements in the field of Wireless Power Transfer (WPT) technologies have enabled various engineering applications with the potential for product implementation. The author explores the different technologies of WPT, such as microwave generators with semi-conductor and microwave tubes, antennas, phased arrays, beam efficiency, and rectifiers (rectennas). These are described by comparing a coupling WPT. The book also covers the applications of WPT, such as energy harvesting, sensor networks, point-to-point WPT, WPT to moving target (airplanes, vehicles, etc.), and solar power satellites, making it suitable for all specialists in the field of WPT and RF.

Contents
1. History, Present and Future of WPT.
2. Theory of WPT.
3. Technologies of WPT.
4. Applications of WPT.

Bistatic radar consists of a radar system which comprises a transmitter and receiver which are separated by a distance comparable to the expected target distance. This book provides a general theoretical description of such bistatic technology in the context of synthetic aperture, inverse synthetic aperture and forward scattering radars from the point of view of analytical geometrical and signal formation as well as processing theory. Signal formation and image reconstruction algorithms are developed with the application of high informative linear frequency and phase code modulating techniques, and numerical experiments that confirm theoretical models are carried out. The authors suggest the program implementation of developed algorithms.

A theoretical summary of the latest results in the field of bistatic radars is provided, before applying an analytical geometrical description of scenarios of bistatic synthetic aperture, inverse synthetic aperture and forward scattering radars with cooperative and non-cooperative transmitters. Signal models with linear frequency and phase code modulation are developed, and special phase modulations with C/A (coarse acquisition) and P (precision) of GPS satellite transmitters are considered. The authors suggest Matlab implementations of all geometrical models and signal formation and processing algorithms.

Contents
2. BSAR Geometry.
3. BSAR Waveforms and Signal Models.
4. BSAR Image Reconstruction Algorithms.
5. Analytical Geometrical Determination of BSAR Resolution.
6. BSAR Experimental Results.
7. BSAR Matlab Implementation.

Electromagnetic wave scattering from random rough surfaces is an active, interdisciplinary area of research with myriad practical applications in fields such as optics, acoustics, geoscience and remote sensing. Focusing on the case of random rough surfaces, this book presents classical asymptotic models used to describe electromagnetic wave scattering. The authors begin by outlining the basic concepts relevant to the topic before moving on to look at the derivation of the scattered field under asymptotic models, based on the Kirchhoff-tangent plane, in order to calculate both the scattered field and the statistical average intensity.

More elaborated asymptotic models are also described for dealing with specific cases, and numerical results are presented to illustrate these models. Comparisons with a reference numerical method are made to confirm and refine the theoretical validity domains. The final chapter derives the expressions of the scattering intensities of random rough surfaces under the asymptotic models. Its expressions are given for their incoherent contributions, from statistical calculations. These results are then compared with numerical computations using a Monte-Carlo process, as well as with experimental models, for sea surface backscattering.

Contents
2. Derivation of the Scattered Field under Asymptotic Models.
3. Derivation of the Normalized Radar Cross-Section under Asymptotic Models.
4. Appendix 1. Far-Field Scattered Fields under the Method of Stationary Phase.
5. Appendix 2. Calculation of the Scattering Coefficients under the GO for 3D Problems.
The Method of Moments (MoM) is applied in this book to compute the field scattered by scatterers such as canonical objects (cylinder or plate) or a randomly rough surface, and also by an object above or below a random rough surface. Since the problem is considered to be 2D, the integral equations (IEs) are scalar and only the TE (transverse electric) and TM (transverse magnetic) polarizations are addressed (no cross-polarizations occur).

Contents
1. Integral Equations for a Single Scatterer: Method of Moments and Rough Surfaces.
2. Validation of the Method of Moments for a Single Scatterer.
3. Scattering from Two Illuminated Scatterers.
4. Scattering from Two Scatterers Where Only One is Illuminated.
Appendix. Matlab Codes.

Optics in Instruments
Edited by Jean-Pierre Goure, Jean Monnet
University, Saint-Etienne, France

May 2011 • 320 pages • USD 132.00
ISBN: 9781848212435 • Title co-published with Wiley

Contents
1. Optics and Instruments.
2. Formation of Images.
3. A Revision of Photometry and Radiometry.
4. Light Sources for Optical Instruments.
5. Colorimetry.
7. Optics for Imaging: Definition, Manufacturing, Applications.
8. Optics for Images at Low Light Levels.
9. From the Classic Microscope to the Tunnel Effect Microscope.

Metamaterials and Wave Control
Edited by Éric Lheurette, University of Lille, France

October 2013 • 240 pages • USD 90.00
ISBN: 9781848215184 • Title co-published with Wiley

This book provides an overview of the metamaterial concept as a prospect for a new practical tool for the study of waves and engineering, including both the electromagnetic spectrum, from microwaves to optics, and the field of acoustic waves.

Contents
1. Overview of Microwave and Optical Metamaterial Technologies.
5. Dissipative Loss in Resonant Metamaterials.
7. Metamaterials for Control of Surface Electromagnetic and Liquid Waves.
8. Classical Analog of Electromagnetically Induced Transparency.

Optics in Instruments
APPLICATIONS TO BIOLOGY AND MEDICINE
Edited by Jean-Pierre Goure, Jean Monnet
University, Saint-Etienne, France

April 2013 • 256 pages • USD 125.00
ISBN: 9781848212442 • Title co-published with Wiley

Contents
3. Optical Coherence Tomography.
4. Therapeutic Applications of Lasers.
5. Plasmonics.

Wireless Telecommunication Systems
Michel Terré and Mylène Pischella, CNAM, Paris and Emmanuelle Vivier, ISEP, France

July 2013 • 224 pages • USD 95.00
ISBN: 9781848215436 • Title co-published with Wiley

Wireless telecommunication systems generate a huge amount of interest. In the last two decades, these systems have experienced at least three major technological leaps, and it has become impossible to imagine how society was organized without them. In this book, we propose a macroscopic approach on wireless systems, and aim at answering key questions about power, data rates, multiple access, cellular engineering and access networks architectures.

We present a series of solved problems, whose objective is to establish the main elements of a global link budget in several radiocommunications systems.

Contents
1. Radio Propagation.
2. F/TDMA and GSM.
3. CDMA and UMTS.
4. OFDM and LTE.
5. MIMO and Beamforming.
6. UWB.
7. Synchronization.
Non-standard Antennas
Edited by François Le Chevalier, THALES Air Systems, Dominique Lesselier, Paris-Sud University and Robert Staraj, University of Nice Sophia Antipolis, France
April 2011 • 480 pages • USD 205.00
ISBN: 9781848212749 • Title co-published with Wiley

This book describes the wide variety of new technologies and concepts of non-standard antenna systems and how they open the way to a wide range of applications, from personal security and communications to multifunction radars and towed sonars, or satellite navigation systems, with space-time diversity on transmit and receive.

Contents
Part 1. Emerging Concepts
1. Joint Diversity and Beamforming for Downlink Communications.
2. Acoustic Antennas for Biomedical and Industrial Ultrasonic Imaging.
3. Space-time Exploration for Airborne Radars.
Part 2. Technologies
5. From a Molecule to an Electro-optic Antenna.
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10. High Impedance Surface Close to a Radiating Dipole.
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Part 4. Ultra-wideband

Radio Resource Allocation and Dynamic Spectrum Access
Badr Benmammar and Asma Amraoui, University Abou Bekr Belkaid Tiemcen, Algeria
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This book presents the state of the art of the different techniques for spectrum access using cooperation and competition to solve the problem of spectrum allocation and ensure better management of radio resources in a radio cognitive context.

Contents
1. Wireless and Mobile Networks.

Mechanical and Electromagnetic Vibrations and Waves
Tamer Bécherrawy, Consultant, France
May 2011 • 448 pages • USD 177.00
ISBN: 9781848212831 • Title co-published with Wiley

This text treats in depth the basic principles and methods of analyzing various physical phenomena. After a detailed study of mechanical and electromagnetic vibrations, their superposition and Fourier analysis, the part on waves includes the general properties of propagation, a detailed study of mechanical (elastic and acoustic) and electromagnetic waves, propagation, attenuation, dispersion, reflection, interference and diffraction of waves.

Contents
1. Free Oscillations.
2. Superposition of Harmonic Quantities, Fourier Analysis.
3. Forced Oscillations.
4. Propagation in an Indefinite Medium.
5. Mechanical Waves.
7. Reflection and Refraction of Waves.
8. Effects of the Motion of the Source and the Observer.
10. Standing Waves and Guided Waves.

Digital Holography
Pascal Picart, ENSIM, Le Mans, France and Jun-chang Li, Kunming University of Sciences and Technologies, China
February 2012 • 384 pages • USD 147.00
ISBN: 9781848213449 • Title co-published with Wiley

This book presents a substantial description of the principles and applications of digital holography. The first part of the book deals with mathematical basics and the linear filtering theory necessary to approach the topic. The next part describes the fundamentals of diffraction theory and exhaustively details the numerical computation of diffracted fields using FFT algorithms. A thorough presentation of the principles of holography and digital holography, including digital color holography, is proposed in the third part.

A special section is devoted to the algorithms and methods for the numerical reconstruction of holograms. Keys so as to understand the differences between digital holography and speckle interferometry and examples of software for hologram reconstructions are also treated in brief.

Contents
1. Mathematical Prerequisites.
6. Reconstructing Wavefronts Propagated through an Optical System.
Photonic Waveguides
THEORY AND APPLICATIONS
Azzedine Boudrioua, University of Metz, France
9781848210271 • April 2009 • 352 pages • USD 165.00

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FROM INSTRUMENT TO COMPUTER
Philippe Guillaume, INSA, Toulouse, France
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Thomas Scelo (translator and contributor), University of Auckland, New Zealand
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