

Theoretical Computer Science 2009/10

Series on Coding Theory and Cryptology

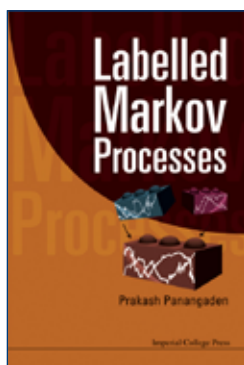
SELECTED TOPICS IN INFORMATION AND CODING THEORY

edited by **Issac Woungang** (*Ryerson University, Canada*), **Sudip Misra** (*Indian Institute of Technology, Kharagpur, India*) & **Subhas Chandra Misra** (*State University of New York at Buffalo, USA*)

This book provides a comprehensive guide to selected topics, both ongoing and emerging, in information and coding theory. Consisting of contributions from well-known and high-profile researchers in their respective specialties, topics that are covered include source coding; channel capacity; linear complexity; code construction, existence and analysis; bounds on codes and designs; space-time coding; LDPC codes; and codes and cryptography.

Readership: Undergraduate and graduate students, researchers and practitioners in the areas of coding and information theory.

500pp (approx.) **Fall 2009**
978-981-283-716-5 **US\$120 £90**



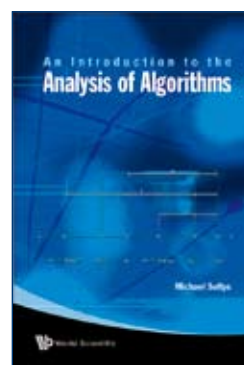
LABELLED MARKOV PROCESSES

by **Prakash Panangaden** (*McGill University, Canada*)

Labelled Markov processes are probabilistic versions of labelled transition systems with continuous state spaces. The book covers basic probability and measure theory on continuous state spaces and then develops the theory of LMPs. The main topics covered are bisimulation, the logical characterization of bisimulation, metrics and approximation theory. An unusual feature of the book is the connection made with categorical and domain theoretic concepts.

Readership: Academics, researches and postgraduate students in theoretical computer science and stochastic analysis.

212pp **Jun 2009**
978-1-84816-287-7 **US\$65 £49**



AN INTRODUCTION TO THE ANALYSIS OF ALGORITHMS

by **Michael Soltys** (*McMaster University, Canada*)

This textbook covers the mathematical foundations of the analysis of algorithms. The gist of the book is how to argue, without the burden of excessive formalism, that a given algorithm does what it is supposed to do. The two key ideas of the proof of correctness, induction and invariance, are employed in the framework of pre/post-conditions and loop invariants.

Contents: Preliminaries; Greedy Algorithms; Divide and Conquer; Dynamic Programming; Randomized Algorithms; Online Algorithms.

Readership: Undergraduate students in computer science, software engineers and mathematicians.

150pp (approx.) **Winter 2009**
978-981-4271-40-0 **US\$45 £34**



HIGHLIGHTS

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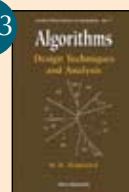
Series on
Theoretical Computer Science – Vol. 1
**THEORY OF RANDOMIZED
SEARCH HEURISTICS**
Foundations and Recent Developments
edited by **Benjamin Doerr** (*Max-Planck-
Institut für Informatik, Germany*) &
Anne Auger (*INRIA, France*)

IISc Research Monographs Series – Vol. 2
**MODERN APPLICATIONS OF
AUTOMATA THEORY**
edited by **Deepak D'Souza** & **Priti Shankar**
(*Indian Institute of Science, India*)

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Lecture Notes Series on
Computing – Vol. 7
ALGORITHMS
Design Techniques and Analysis
by **M H Alsuwaiyel**
(*King Fahd University of
Petroleum & Minerals (KFUPM),
Saudi Arabia*)

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Series on Theoretical Computer Science – Vol. 1

THEORY OF RANDOMIZED SEARCH HEURISTICS

Foundations and Recent Developments

edited by **Benjamin Doerr** (*Max-Planck-Institut für Informatik, Germany*) & **Anne Auger** (*INRIA, France*)

This book covers both classical results and the most recent theoretical developments in the field of randomized search heuristics such as runtime analysis, drift analysis and convergence. Each chapter provides an overview of a particular domain and gives insights into the proofs and proof techniques of more specialized areas. Open problems still remain widely in randomized search heuristics — being a relatively young and vast field. These problems and directions for future research are addressed and discussed in this book.

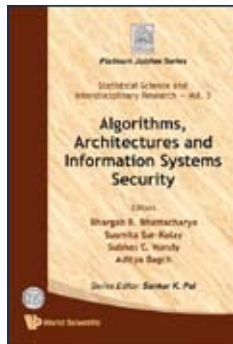
Readership: Advanced undergraduates and graduate students in computer science and mathematics; experts and non-experts interested in theory of randomized search heuristics.

250pp (approx.) **Spring 2010**
978-981-4282-66-6 **US\$80 £60**

Statistical Science and Interdisciplinary Research – Vol. 3

ALGORITHMS, ARCHITECTURES AND INFORMATION SYSTEMS SECURITYedited by **Bhargab B Bhattacharya**, **Susmita Sur-Kolay**, **Subhas C Nandy** & **Aditya Bagchi** (*Indian Statistical Institute, India*)

This volume contains articles written by leading researchers in the fields of algorithms, architectures, and information systems security. The first five chapters address several challenging geometric problems and related algorithms. These topics have major applications in pattern recognition, image analysis, digital geometry, surface reconstruction, computer vision and in robotics. The next five chapters focus on various optimization issues in VLSI design and test architectures, and in wireless networks. The last six chapters comprise scholarly articles on information systems security covering privacy issues, access control, enterprise and network security, and digital image forensics.



Readership: Researchers, professionals and advanced graduates in theoretical computer science, electrical & electronics engineering, and combinatorics & graph theory.

384pp **Nov 2008**
978-981-283-623-6 **US\$105 £57**

IISc Research Monographs Series – Vol. 2

MODERN APPLICATIONS OF AUTOMATA THEORYedited by **Deepak D'Souza** & **Priti Shankar** (*Indian Institute of Science, India*)**Key Features**

- Includes prominent contributors such as Manindra Agrawal, winner of the 2006 Godel Prize, the 2006 Fulkerson Prize, and the 2002 Clay Research Award among others, for his famous paper "Primes is in P"
- Other contributors include Javier Esparza, Paul Gastin, Wolfgang Thomas, and P S Thiagarajan, who are internationally acclaimed experts in concurrency, logic, and verification

Readership: Computer scientists interested in the practical applications of automata theory; practitioners interested in modern verification techniques.

200pp (approx.) **Winter 2009**
978-981-4271-04-2 **US\$78 £59**

CONTEXT-FREE LANGUAGES AND PRIMITIVE WORDSby **Pál Dömösi** (*Debrecen University, Hungary*), **Sándor Horváth** (*Eötvös Loránd University, Hungary*) & **Masami Ito** (*Kyoto Sangyo University, Japan*)

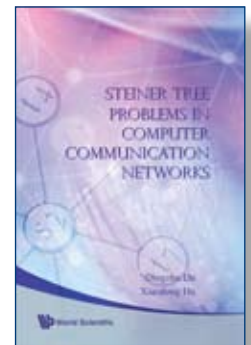
A word is said to be *primitive* if it cannot be represented as any power of another word. It is a well-known conjecture that the set of all primitive words Q over a non-trivial alphabet is not context-free: this conjecture is still open. In this book, the authors deal with properties of primitive words over a non-primitive alphabet, the language consisting of all primitive words and related languages. Moreover, some decidable and undecidable problems with respect to the above languages are discussed as well. As another try, a search for a non-phrase structure grammar which generates Q is performed.

Readership: Researchers, lecturers, senior undergraduates and graduate students in theoretical computer science.

200pp (approx.) **Spring 2010**
978-981-4271-66-0 **US\$65 £49**

STEINER TREE PROBLEMS IN COMPUTER COMMUNICATION NETWORKSby **Dingzhu Du** (*University of Texas at Dallas, USA*) & **Xiaodong Hu** (*Chinese Academy of Sciences, China*)

The Steiner tree problem is one of the most important combinatorial optimization problems. It has a long history that can be traced back to the famous mathematician Fermat (1601–1665). This book studies three significant breakthroughs on the Steiner tree problem that were achieved in the 1990s, and some important applications of Steiner tree problems in computer communication networks researched in the past fifteen years. It not only covers some of the most recent developments in Steiner tree problems, but also discusses various combinatorial optimization methods, thus providing a balance between theory and practice.



Readership: Researchers and graduate students of computer science and engineering as well as operations research.

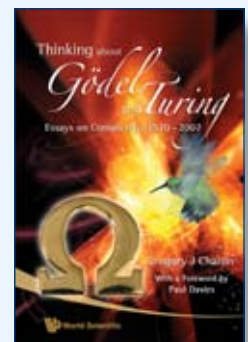
Key Feature

- The first author, Dingzhu Du, received the CSTS prize from INFORMS for research excellence in the interface between operations research and computer science, including his important work on Steiner tree problems

376pp **Feb 2008**
978-981-279-144-3 **US\$95 £49**

HIGHLY RECOMMENDED**THINKING ABOUT GODEL AND TURING: ESSAYS ON COMPLEXITY, 1970 – 2007**by **Gregory J Chaitin** (*IBM T J Watson Research Center, USA*)

368pp **Aug 2007**
978-981-270-895-3 **US\$118 £62**



BESTSELLERS

GENERAL SYSTEMS THEORY

Problems, Perspectives, Practice
(2nd Edition)

by **Lars Skyttner** (*University of Gävle, Sweden*)

"It is impossible not to be impressed by the author's enthusiasm and crusading spirit in stressing the need for the systems approach."

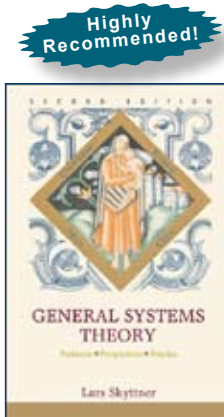
Professor Alex Andrew
KYBERNETES

The International Journal of Systems and Cybernetics

This revised and updated second edition of *General Systems Theory — Ideas and Applications* includes new systems theories and a new chapter on self-organization and evolution.

Readership: Computer specialists, architects, businessmen, decision makers of all kinds, teachers and holistic thinkers.

536pp Jan 2006
978-981-256-389-7 US\$157 £85
978-981-256-467-2(pbk) US\$79 £42

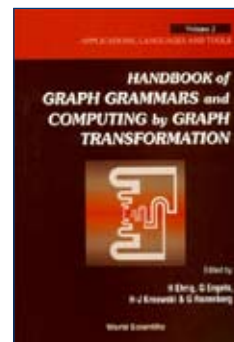


HANDBOOK OF GRAPH GRAMMARS AND COMPUTING BY GRAPH TRANSFORMATION

Volume 2: Applications, Languages and Tools
edited by **H Ehrig** (*Technical University of Berlin, Germany*), **G Engels** (*University of Paderborn, Germany*), **H-J Kreowski** (*University of Bremen, Germany*) & **G Rozenberg** (*Leiden University, The Netherlands*)

Volume 2 of the indispensable *Handbook of Graph Grammars and Computing by Graph Transformations* considers applications to functional languages, visual and object-oriented languages, software engineering, mechanical engineering, chemical process engineering, and images. It also presents implemented specification languages and tools, and structuring and modularization concepts for specification languages.

Readership: Students and researchers interested in modern developments in computer science, and in particular in the use of modern formal methods in applied computer science.



720pp Oct 1999
978-981-02-4020-2 US\$154 £96

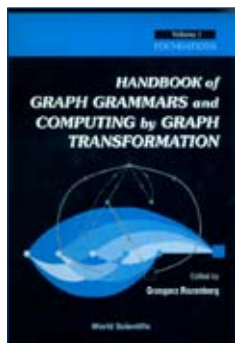
HANDBOOK OF GRAPH GRAMMARS AND COMPUTING BY GRAPH TRANSFORMATION

Volume 1: Foundations
edited by **Grzegorz Rozenberg** (*Leiden University, The Netherlands*)

Volume 1 of the indispensable *Handbook of Graph Grammars and Computing by Graph Transformations* includes a state-of-the-art presentation of the foundations of all the basic approaches to rule-based graph specification and transformation: algebraic approach, logic approach, node-based rewriting, (hyper)edge-based rewriting, programmed graph rewriting, and 2-structures. The book has been written in a tutorial/survey style to enhance its usefulness.

Readership: Computer scientists and mathematicians.

572pp Feb 1997
978-981-02-2884-2 US\$103 £64



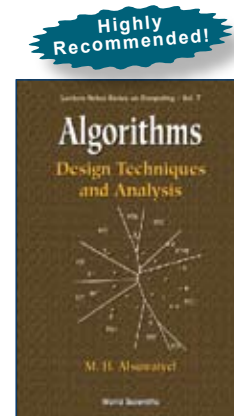
Lecture Notes Series on Computing – Vol. 7

ALGORITHMS

Design Techniques and Analysis
by **M H Alsuwaiyel** (*King Fahd University of Petroleum & Minerals (KFUPM), Saudi Arabia*)

Problem solving is an essential part of every scientific discipline. It has two components: (1) problem identification and formulation, and (2) solution of the formulated problem. One can solve a problem on its own using *ad hoc* techniques or follow those techniques that have produced efficient solutions to similar problems. This requires the understanding of various algorithm design techniques, how and when to use them to formulate solutions and the context appropriate for each of them.

Readership: Senior undergraduates, graduate students and professionals in software development.



544pp Sept 1999
978-981-02-3740-0 US\$97 £61

World Scientific Series in Computer Science – Vol. 13

MATHEMATICAL LOGIC FOR COMPUTER SCIENCE

by **Lu Zhongwan** (*Academia Sinica, Beijing*)

This book describes the aspects of mathematical logic related to computer sciences. The materials adopted in this book are intended to attend to both the peculiarities of logical systems and the requirements of computer science.

Readership: Graduates, undergraduates and researchers in computer science.

260pp July 1989
978-9971-50-251-5 US\$64 £44

