Computational Structures and Algorithms for Association Rules

The Galois Connection

Computational Structures and Algorithms for Association Rules presents the development of state-of-the-art algorithms for finding association rules. The rigorous mathematical construction of each algorithm is described in detail, covering advanced approaches such as formal concept analysis and Galois connection frameworks. Features: presents an extensive use of proofs, definitions, propositions, procedures, and examples throughout the text; introduces the Galois framework, including definitions of the basic notion; describes enumeration algorithms for solving problems of finding all formal concepts, all formal anti-concepts, and bridging the gap between concepts and anti-concepts; includes a helpful notation section, and useful chapter summaries; examines an alternative – non-enumerative – approach to solving the same problems, resulting in the construction of an incremental algorithm; discusses solutions to the problem of building limited-size and minimal generator sets (representations) for perfect and approximate association rules (implications).

Features
- Presents the development of state-of-the-art algorithms for finding association rules
- The only necessary prerequisite knowledge is an elementary understanding of lattices, combinatorial optimization, probability calculus, and statistics
- Makes extensive use of proofs, definitions, propositions, procedures, and examples throughout the text

Fields of interest
Database Management; Information Storage and Retrieval; Artificial Intelligence (incl. Robotics)

Target groups
Professional/practitioner

Discount group
P

Guide to Biometrics for Large-Scale Systems

Technological, Operational, and User-Related Factors

This book considers biometric technology in a broad light, integrating the concept seamlessly into mainstream IT, while discussing the cultural attitudes and the societal impact of identity management. Features: summarizes the material covered at the beginning of every chapter, and provides chapter-ending review questions and discussion points; reviews identity verification in nature, and early historical interest in anatomical measurement; provides an overview of biometric technology; presents a focus on biometric systems and true systems integration, examines the concept of identity management, and predicts future trends; investigates performance issues in biometric systems, the management and security of biometric data, and the impact of mobile devices on biometrics technology; explains the equivalence of performance across operational nodes, introducing the APEX system; considers the legal, political and societal factors of biometric technology, in addition to user psychology and other human factors.

Features
- Presents a review of biometric technology and biometric systems, and the concept of identity management
- Discusses the legal, political and societal factors of biometric technology, in addition to user psychology and other human factors
- Provides chapter-ending review questions and discussion points

Fields of interest
Biometrics

Target groups
Professional/practitioner

Discount group
P

Geospatial Semantics and the Semantic Web

Foundations, Algorithms, and Applications

The availability of geographic and geospatial information and services, especially on the open Web has become abundant in the last several years with the proliferation of online maps, geo-coding services, geospatial Web services and geospatially enabled applications. The need for geospatial reasoning has significantly increased in many everyday applications including personal digital assistants, Web search applications, local aware mobile services, specialized systems for emergency response, medical triaging, intelligence analysis and more.

Geospatial Semantics and the Semantic Web: Foundations, Algorithms, and Applications, an edited volume contributed by world class leaders in this field, provides recent research in the theme of geospatial semantics. This edited volume presents new information systems applications that have potential for high impact and commercialization. Also, special effort was made by the contributors to focus on geospatial ontology development, related standards, geospatial ontology alignment and integration, and algorithmic techniques for geospatial semantics. Case studies and examples will be provided throughout this book as well as possibilities for future research.

Features
- Discusses geospatial ontology development, related standards, geospatial ontology alignment and integration, and algorithmic techniques for geospatial semantics
- Covers the development and maintenance of standard ontologies
- Case studies and examples will be provided throughout this book as well as possibilities for future research

Fields of interest
Information Systems Applications (incl.Internet); Computer Applications in Earth Sciences; Information Storage and Retrieval

Target groups
Research

Discount group
P
Real-Time Graphics Rendering Engine

“Real-Time Graphics Rendering Engine” reveals the software architecture of the modern real-time 3D graphics rendering engine and the relevant technologies based on the authors’ experience developing this high-performance, real-time system. The relevant knowledge about real-time graphics rendering such as the rendering pipeline, the visual appearance and shading and lighting models are also introduced. This book is intended to offer well-founded guidance for researchers and developers who are interested in building their own rendering engines.

Hujun Bao is a professor at the State Key Lab of Computer Aided Design and Computer Graphics, Zhejiang University, China. Dr. Wei Hua is an associate professor at the same institute.

Features
► Contains both scientific theories and practical tips for algorithms ► Based on original research and development experiences of the authors, who offer their insight ► Unlike computer graphics texts, this book focuses on the techniques to develop a powerful real-time rendering engine

Field of interest
Computer Graphics

Target groups
Research

Discount group
P

C. Chen, Drexel University, Philadelphia, USA

Turning Points
The Nature of Creativity

“Turning Points: The Nature of Creativity” discusses theories and methods focusing on a critical concept of intellectual turning points in the context of critical thinking, scientific discovery, and problem solving in general. This book introduces a novel analytical and experimental system that provides not only new ways for retrospective studies of scientific change but also for characterizing transformative potentials of prospective scientific contributions. The book is intended for scientists and researchers in the fields of information science and computer science.

Dr. Chaomei Chen is an Associate Professor at the College of Information Science and Technology, Drexel University, USA.

Features
► Provides a wide range of complex phenomena in a consistent and simple concept ► Introduces an explanatory and computational theory of transformational scientific discovery ► Demonstrates a comprehensive use of a visual analytic tool for detecting emerging trends and patterns in scientific literature ► Presents a collection of compelling case studies from the real world

Fields of interest
Information Systems and Communication Service; Philosophy of Science; Science Education

Target groups
Research

Discount group
P

D. England, Liverpool John Moores University, Liverpool, United Kingdom (Ed.)

Whole Body Interaction

Whole Body Interaction is “The integrated capture and processing of human signals from physical, physiological, cognitive and emotional sources to generate feedback to those sources for interaction in a digital environment” (England 2009). Whole Body Interaction looks at the challenges of Whole Body Interaction from the perspectives of design, engineering and research methods. How do we take physical motion, cognition, physiology, emotion and social context to push boundaries of Human Computer Interaction to involve the complete set of human capabilities? Through the use of various applications the authors attempt to answer this question and set a research agenda for future work.

Aimed at students and researchers who are looking for new project ideas or to extend their existing work with new dimensions of interaction.

Features
► Whole Body Interaction brings together a number of fields not previously associated together, namely Computer Science, Movement Science and Digital Art ► Includes contributions from people who are experts in a range of disciplines ► Focuses on current research and ideas for new projects on the integration of input and output from human motion, human physiology, cognitive models and emotional states

Fields of interest
Multimedia Information Systems; User Interfaces and Human Computer Interaction; Pattern Recognition

Target groups
Research

Discount group
P
Semantic Web Services

A paradigm shift is taking place in computer science: one generation ago, we learned to abstract from software to hardware. Now we are abstracting from software to serveware implemented through service-oriented computing. Yet ensuring interoperability in open, heterogeneous, and dynamically changing environments, such as the Internet, remains a major challenge for actual machine-to-machine integration. Usually significant problems in aligning data, processes, and protocols appear as soon as a specific piece of functionality is used within a different application context. The Semantic Web Services (SWS) approach is about describing services with metadata on the basis of domain ontologies as a means to enable their automatic location, execution, combination, and use. Fensel and his coauthors provide a comprehensive overview of SWS in line with actual industrial practice. They introduce the main sociotechnological components that ground the SWS vision (like Web Science, Service Science, and service-oriented architectures) and several approaches that realize it, e.g., the Web Service Modeling Framework, OWL-S, and RESTful services. The real-world relevance is emphasized through a series of case studies from large-scale R&D projects and a business-oriented proposition from the SWS technology provider Seekda.

Features
- Combines extensive research and practical experience in one resource
- Applicable both for student courses in distributed systems or Semantic Web curricula and for self-study
- Includes recent technologies and findings such as RESTful services and Web Science
- Encompasses both technological and business aspects of Web Services
- Complemented by a dedicated website www.swsbook.org offering teaching material and additional examples

Fields of interest
Information Systems Applications (incl. Internet); Artificial Intelligence (incl. Robotics); Information Systems

Target groups
Professional/practitioner

Discount group
P

Advances on Modeling in Tissue Engineering

This book presents a collection of chapters describing the state of the art on computational modelling and fabrication in tissue engineering. Tissue Engineering is a multidisciplinary field involving scientists from different fields. The development of mathematical methods is quite relevant to understand cell biology and human tissues as well as model, design and fabricate optimized and smart scaffolds. The chapter authors are the distinguished keynote speakers at the first Eccomas thematic conference on Tissue Engineering where the emphasis was on mathematical and computational modeling for scaffold design and fabrication. This particular area of tissue engineering, whose goal is to obtain substitutes for hard tissues such as bone and cartilage, is growing in importance.

Features
- Presents recent developments of modeling and fabrication in tissue engineering
- Contribution by distinguished researchers in the field
- Reflects the multidisciplinary character of the field from cell biology to scaffold material and fabrication

Fields of interest
Computer-Aided Engineering (CAD, CAE) and Design; Biomedical Engineering; Biomaterials

Target groups
Research

Discount group
P

Conditionals and Modularity in General Logics

This text centers around three main subjects. The first is the concept of modularity and independence in classical logic and nonmonotonic and other nonclassical logic, and the consequences on syntactic and semantical interpolation and language change. In particular, we will show the connection between interpolation for nonmonotonic logic and manipulation of an abstract notion of size. Modularity is essentially the ability to put partial results achieved independently together for a global result. The second aspect of the book is the authors’ uniform picture of conditionals, including many-valued logics and structures on the language elements themselves and on the truth value set. The third topic explained by the authors is neighbourhood semantics, their connection to independence, and their common points and differences for various logics, e.g., for defaults and deontic logic, for the limit version of preferential logics, and for general approximation.

The book will be of value to researchers and graduate students in logic and theoretical computer science.

Features
- The authors present results on modularity and interpolation for monotonic and nonmonotonic logic, using a semantic approach and revealing new insights
- The first monograph on this topic
- This book is useful for researchers and advanced students

Fields of interest
Mathematical Logic and Formal Languages; Artificial Intelligence (incl. Robotics); Mathematical Logic and Foundations

Target groups
Research

Discount group
P
I. Gorton, National ICT Australia, Everleigh, NSW, Australia

**Essential Software Architecture**

Job titles like “Technical Architect” and “Chief Architect” nowadays abound in software industry, yet many people suspect that “architecture” is one of the most overused and least understood terms in professional software development. Gorton’s book tries to resolve this dilemma. It concisely describes the essential elements of knowledge and key skills required to be a software architect. The explanations encompass the essentials of architecture thinking, practices, and supporting technologies. They range from a general understanding of structure and quality attributes through technical issues like middleware components and service-oriented architectures to recent technologies like model-driven architecture, software product lines, aspect-oriented design, and the Semantic Web, which will presumably influence future software systems. This second edition contains new material covering enterprise architecture, agile development, enterprise service bus technologies, RESTful Web services, and a case study on how to use the MeDICi integration framework.

**Features**

- Provides clear and concise information about methods and techniques for architectural best-practice in IT systems
- Describes and analyses component and middleware technologies that support fundamental architectural patterns in enterprise systems
- Looks forward to how recent and emerging technologies like SOA, MDA, AOD, and software product lines may affect the next generation of enterprise information system architectures
- Uses real-world examples from banking, e-commerce, and government information systems to explain methods and technologies
- Provides many pointers and references to further work on software architecture

**Fields of interest**

Software Engineering; Management of Computing and Information Systems; Information Systems

**Target groups**

Professional/practitioner

**Discount group**

P

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M. Hua, Facebook, Inc., Palo Alto, CA, USA; J. Pei, Simon Fraser University, Burnaby, British Columbia, Canada

**Ranking Queries on Uncertain Data**

Uncertain data is inherent in many important applications, such as environmental surveillance, market analysis, and quantitative economics research. Due to the importance of those applications and rapidly increasing amounts of uncertain data collected and accumulated, analyzing large collections of uncertain data has become an important task. Ranking queries (also known as top-k queries) are often natural and useful in analyzing uncertain data. Ranking Queries on Uncertain Data discusses the motivations/applications, challenging problems, the fundamental principles, and the evaluation algorithms of ranking queries on uncertain data. Theoretical and algorithmic results of ranking queries on uncertain data are presented in the last section of this book. Ranking Queries on Uncertain Data is the first book to systematically discuss the problem of ranking queries on uncertain data.

**Features**

- Presents challenging problems, the fundamental principles, and the evaluation algorithms of ranking queries on uncertain data
- Includes efficient and scalable query evaluation algorithms for the ranking queries
- Covers a comprehensive empirical evaluation of the queries
- The first book to systematically discuss the problem of ranking queries on uncertain data

**Fields of interest**

Database Management; Data Mining and Knowledge Discovery; Information Systems Applications (incl.Internet)

**Target groups**

Research

**Discount group**

P

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S. Kitaev, University of Reykjavik, Iceland

**Patterns in Permutations and Words**

There has been considerable interest recently in the subject of patterns in permutations and words, a new branch of combinatorics with its roots in the works of Rotem, Rogers, and Knuth in the 1970s. Consideration of the patterns in question has been extremely interesting from the combinatorial point of view, and it has proved to be a useful language in a variety of seemingly unrelated problems, including the theory of Kazhdan—Lusztig polynomials, singularities of Schubert varieties, interval orders, Chebyshev polynomials, models in statistical mechanics, and various sorting algorithms, including sorting stacks and sortable permutations.

The author collects the main results in the field in this up-to-date, comprehensive reference volume. He highlights significant achievements in the area, and points to research directions and open problems. The book will be of interest to researchers and graduate students in theoretical computer science and mathematics, in particular those working in algebraic combinatorics and combinatorics on words. It will also be of interest to specialists in other branches of mathematics and theoretical physics.

The author collects the main results in the field in this up-to-date, comprehensive reference volume. He highlights significant achievements in the area, and points to research directions and open problems.

**Features**

- The main results in the field are collected in this up-to-date, comprehensive reference volume
- The author addresses differences in ideas and notations, highlights the main achievements, and points to research directions and open problems
- Will be of interest to researchers and graduate students in theoretical computer science and mathematics

**Fields of interest**

Theory of Computation; Mathematics of Computing

**Target groups**

Research

**Discount group**

P
Quality-Based Content Delivery over the Internet

"Quality-Based Content Delivery over the Internet" mainly discusses the methodology of doing quality-based content delivery in an Internet environment. Because the network is becoming intelligent and active, more and more researchers are talking about achieving personalization and customization in Internet content delivery. As researchers are aware, by introducing intelligence into a web intermediary server, they can make the content delivery more efficient and of higher quality. Still, the detailed methodology of doing so is never illustrated fully. The most critical part will be the active content transformation model. This book gives a detailed description of the active content transformation model, and provides experiments and data to show its feasibility. Some examples of how to do efficient content transformation in active web intermediary to achieve high quality are also presented to help understand the whole process. The book is an introduction and excellent reference for researchers in the Internet content delivery area.

Features
► Detailed discussion about content delivery mechanism in today's Internet
► Novel model for active content transformation in network
► Explicit performance study about different modes of content transformation in network
► Real-life examples and experiments give readers better illustration

Fields of interest
Computer Systems Organization and Communication Networks; Computer Communication Networks; Computer System Implementation

Target groups
Research

Discount group
P

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Due May 2011

2011. 300 p. (The Information Retrieval Series, Volume 29) Hardcover
► $129.00
ISBN 978-3-642-19230-2

Current Challenges in Patent Information Retrieval

Patents form an important knowledge resource – much technical information represented in patents is not represented in scientific literature – and at the same time they are important, and economically highly relevant, legal documents. Between 1998 and 2008, the number of patent applications filed yearly worldwide grew by more than 50 percent. Yet still we see a huge gap between, on the one hand, the technologies that emerged from research labs and are in use in major Internet search engines or in enterprise search systems, and, on the other hand, the systems used daily by the patent search communities.

In the past few years, the editors have organized a series of events at the Information Retrieval Facility in Vienna, Austria, bringing together leading researchers in information retrieval (IR) and those who practice and use patent search, thus establishing an interdisciplinary dialogue between the IR and the intellectual property (IP) communities and creating a discursive as well as empirical space for sustainable discussion and innovation. This book is among the results of that joint effort. Many of the chapters were written jointly by IP and IR experts, while all chapters were reviewed by representatives of both communities, resulting in contributions that foster the proliferation and exchange of knowledge across fields and disciplinary mindsets.

Features
► Offers a comprehensive overview on the quickly growing domain of patent retrieval
► Jointly written by members of the information retrieval and patent information communities
► Combines scientific rigorous results with industrial application requirements

Fields of interest
Information Storage and Retrieval; Document Preparation and Text Processing; Computer Appl. in Administrative Data Processing

Target groups
Research

Discount group
P

Due April 2011

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2011. XII, 263 p. (Undergraduate Topics in Computer Science) Softcover
► approx. $39.95
ISBN 978-0-85729-494-4

Pattern Recognition
An Algorithmic Approach

Observing the environment and recognising patterns for the purpose of decision making is fundamental to human nature. This book deals with the scientific discipline that enables similar perception in machines through pattern recognition (PR), which has application in diverse technology areas. This book is an exposition of principal topics in PR using an algorithmic approach. It provides a thorough introduction to the concepts of PR and a systematic account of the major topics in PR besides reviewing the vast progress made in the field in recent times. It includes basic techniques of PR, neural networks, support vector machines and decision trees. While theoretical aspects have been given due coverage, the emphasis is more on the practical. The book is replete with examples and illustrations and includes chapter-end exercises. It is designed to meet the needs of senior undergraduate and postgraduate students of computer science and allied disciplines.

Features
► Contains numerous exercises, as well as learning objectives and summaries for each chapter
► Explains the hidden Markov model for speech and speaker recognition tasks
► Discusses support vector machines, with suitable examples

Field of interest
Computer Science, general

Target groups
Upper undergraduate

Discount group
P
Optimization Based Data Mining: Theory and Applications

Optimization techniques have been widely adopted to implement various data mining algorithms. In addition to well-known Support Vector Machines (SVMs) (which are based on quadratic programming), different versions of Multiple Criteria Programming (MCP) have been extensively used in data separations. Since optimization based data mining methods differ from statistics, decision tree induction, and neural networks, their theoretical inspiration has attracted many researchers who are interested in algorithm development of data mining.

Optimization based Data Mining: Theory and Applications, mainly focuses on MCP and SVM especially their recent theoretical progress and real-life applications in various fields. These include finance, web services, bioinformatics and petroleum engineering, which has triggered the interest of practitioners who look for new methods to improve the results of data mining for knowledge discovery.

Most of the material in this book is directly from the research and application activities that the authors’ research group has conducted over the last ten years. Aimed at practitioners and graduates who have a fundamental knowledge in data mining, it demonstrates the basic concepts and foundations on how to use optimization techniques to deal with data mining problems.

Features
- Introduces MCLP for data mining intuitively, systematically and comprehensively
- Offers classification problems and regression problems which are the two main components of data mining
- Constructs SVM’s for solving multi-class classification problems

Fields of interest
Data Mining and Knowledge Discovery; Input/Output and Data Communications

Target groups
Research

Discount group
P

Transactions on High-Performance Embedded Architectures and Compilers III

Transactions on HiPEAC aims at the timely dissemination of research contributions in computer architecture and compilation methods for high-performance embedded computer systems. Recognizing the convergence of embedded and general-purpose computer systems, this journal publishes original research on systems targeted at specific computing tasks as well as systems with broad application bases. The scope of the journal therefore covers all aspects of computer architecture, code generation and compiler optimization methods of interest to researchers and practitioners designing future embedded systems. This third issue contains 14 papers carefully reviewed and selected out of numerous submissions and is divided into four sections. The first section contains the top four papers from the Third International Conference on High-Performance Embedded Architectures and Compilers, HiPEAC 2008, held in Göteborg, Sweden, in January 2008. The second section consists of four papers from the 8th MEDEA Workshop held in conjunction with PACT 2007 in Brasov, Romania, in September 2007. The third section contains two regular papers and the fourth section provides a snapshot from the First Workshop on Programmability Issues for Multicore Computers, MULTIPROG, held in conjunction with HiPEAC 2008.

Features
- State-of-the-art research
- Fast-track publication
- Unique visibility

Fields of interest
Arithmetic and Logic Structures; Processor Architectures; Input/Output and Data Communications

Target groups
Research

Discount group
P

Multimodal Interactive Pattern Recognition and Applications

This book presents a different approach to pattern recognition (PR) systems, in which users of a system are involved during the recognition process. This can help to avoid later errors and reduce the costs associated with post-processing. The book also examines a range of advanced multimodal interactions between the machine and the users, including handwriting, speech and gestures. Features: presents an introduction to the fundamental concepts and general PR approaches for multimodal interaction modeling and search (or inference); provides numerous examples and a helpful Glossary; discusses approaches for computer-assisted transcription of handwritten and spoken documents; examines systems for computer-assisted language translation, interactive text generation and parsing, relevance-based image retrieval, and interactive document layout analysis; reviews several full working prototypes of multimodal interactive PR applications, including live demonstrations that can be publicly accessed on the Internet.

Features
- Provides a new interactive pattern recognition (PR) paradigm in which traditional PR and multimodal human interaction are fused together
- Provides numerous examples and a helpful Glossary
- Reviews several full working prototypes of multimodal interactive PR applications, including live demonstrations that can be publicly accessed through the Internet

Fields of interest
User Interfaces and Human Computer Interaction; Computer Appl. in Administrative Data Processing; Processor Architectures

Target groups
Research

Discount group
P
Transactions on Edutainment V

Editors-in-chief: Z. Pan, Zhejiang University, China; A. D. Cheok, National University of Singapore, Singapore; W. Müller, Guest editor: X. Yang, University of Education, Weingarten, Germany

This journal subline serves as a forum for stimulating and disseminating innovative research ideas, theories, emerging technologies, empirical investigations, state-of-the-art methods, and tools in all different genres of edutainment, such as game-based learning and serious games, interactive storytelling, virtual learning environments, VR-based education, and related fields. It covers aspects from educational and game theories, human-computer interaction, computer graphics, artificial intelligence, and systems design.

The 5th volume in this series represents a selection of 12 contributions from DMDCM 2010, the 5th International Conference on Digital Media and Digital Content Management, held in Chongqing, China, in December 2010, as well as 9 regular papers. The papers cover topics such as human-computer interaction, virtual exhibit, face recognition, character animation etc.; they moreover present a large number of application examples in the area of e-learning, game, animation, multimedia, and virtual reality which gives more broad view on the application of edutainment-related techniques.

Features
► LNCS transactions subline ► Devoted to research and development in the field of edutainment ► Serves as a forum for all different genres of edutainment

Fields of interest
User Interfaces and Human Computer Interaction; Artificial Intelligence (incl. Robotics); Information Systems Applications (incl. Internet)

Target groups
Research

Discount group
P

Transactions on Petri Nets and Other Models of Concurrency IV

Editor-in-chief: K. Jensen, University of Aarhus, Denmark; Guest editors: S. Donatelli, University of Turin, Italy; M. Koutny, Newcastle University, United Kingdom

These Transactions publish archival papers in the broad area of Petri nets and other models of concurrency, ranging from theoretical work to tool support and industrial applications. TopNoC issues are published as LNCS volumes, and hence are widely distributed and indexed. This Journal has its own Editorial Board which selects papers based on a rigorous two-stage refereeing process.

TopNoC contains: Revised versions of a selection of the best papers from workshops and tutorials at the annual Petri net conferences; Special sections/ issues within particular subareas (similar to those published in the Advances in Petri Nets series); Other papers invited for publication in TopNoC;
Papers submitted directly to TopNoC by their authors.

The fourth volume of TopNoC contains revised and extended versions of a selection of the best papers from the workshops held at the 10th International Conference on Application and Theory of Petri Nets and Other Models of Concurrency and from the 10th Workshop and Tutorial on Practical Use of Coloured Petri Nets and the CPN Tools.
The nine papers provide good coverage of a diverse range of topics including workflow systems, model checking, agent-based software systems, the state explosion problem, structure theory for Petri nets, and modal logics.

Features
► The book presents a mixture of theory, tools, and practical applications related to concurrency
► The papers chosen have been through several rounds of selection and improvement ► A detailed introduction to the papers is provided in the front matter, freely available on SpringerLink

Fields of interest
Models and Principles; Theory of Computation; Simulation and Modeling

Target groups
Research

Discount group
P

Process Mining

Discovery, Conformance and Enhancement of Business Processes

More and more information about business processes is recorded by information systems in the form of so-called "event logs". Despite the omnipresence of such data, most organizations diagnose problems based on fiction rather than facts.

Process mining is an emerging discipline based on process model-driven approaches and data mining. It not only allows organizations to fully benefit from the information stored in their systems, but it can also be used to check the conformance of processes, detect bottlenecks, and predict execution problems.

Wil van der Aalst delivers the first book on process mining. It aims to be self-contained while covering the entire process mining spectrum from process discovery to operational support. In Part I, the author provides the basics of business process modeling and data mining necessary to understand the remainder of the book. Part II focuses on process discovery as the most important process mining task. Part III moves beyond discovering the control flow of processes and highlights conformance checking, and organizational and time perspectives. Part IV guides the reader in successfully applying process mining in practice, including an introduction to the widely used open-source tool ProM.

Features
► First book on process mining, bridging the gap between business process modeling and business intelligence ► Written by one of the most influential and most-cited computer scientists and the best-known BPM researcher ► Self-contained and comprehensive overview for a broad audience in academia and industry ► The reader can put process mining into practice immediately due to the applicability of the techniques and the availability of the open-source process mining software ProM

Fields of interest
Information Systems Applications (incl. Internet); Information Storage and Retrieval; Information Systems

Target groups
Research

Discount group
P
D. Yuen, University of Minnesota, Minneapolis, MN, USA; J. Wang, Chinese Academy of Sciences, Beijing, China; L. Johnsson, University of Houston, TX, USA; C. Chi, Y. Shi, Chinese Academy of Sciences, Beijing, China (Eds.)

**GPU Solutions to Multi-scale Problems in Science and Engineering**

This book covers the new topic of GPU computing with many applications involved, taken from diverse fields such as networking, seismology, fluid mechanics, nano-materials, data-mining, earthquakes, mantle convection, visualization. It will show the public why GPU computing is important and easy to use. It will offer a reason why GPU computing is useful and how to implement codes in an everyday situation.

**Features**

- Shows how GPU are used in many diverse problems in science and engineering gives examples of codes
- Written in CUDA for diverse problems
- Shows how algorithms can be implemented on GPU

**Fields of interest**

Numeric Computing; Geophysics/Geodesy; Continuum Mechanics and Mechanics of Materials

**Target groups**

Research

**Discount group**

P

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