
Mathematical Tools For Data Mining Set Theory Partial Orders Combinatorics Advanced Information And Knowledge Processing

Mathematical Software

Data Mining: Concepts, Methodologies, Tools, and Applications

How Big Data Increases Inequality and Threatens Democracy

Cloud Computing for Geospatial Big Data Analytics

Proceedings of the First International Congress of Mathematical Software : Beijing, China, 17-19 August 2002

Spreadsheets, Databases, Matrices, and Graphs

11th International Conference, RSFDGrC 2007, Toronto, Canada, May 14-16, 2007

Exploratory Data Analysis Using R

Data Science and Machine Learning

Mathematical Statistics and Data Analysis

Linear Algebra Tools for Data Mining

Third International Conference, ICICA 2012, Chengde, China, September 14-16, 2012. Proceedings, Part II

Mathematics of Big Data

Information Computing and Applications

Weapons of Math Destruction

Mathematics for Machine Learning

Mathematical Tools for Data Mining

Mining Imperfect Data

Mathematical and Statistical Methods

Methodologies for Knowledge Discovery and Data Mining

Systems Analysis Tools for Better Health Care Delivery

Data Mining and Mathematical Programming

14th International Conference, RSFDGrC 2013, Halifax, NS, Canada, October 11-14, 2013. Proceedings

Data Mining in Biomedicine

Matrix Methods in Data Mining and Pattern Recognition, Second Edition

With Examples in R and Python, Second Edition

Linear Algebra Tools for Data Mining

Association Rule Mining for Data Mining

Opportunities and Challenges

Third Pacific-Asia Conference, PAKDD'99, Beijing, China, April 26-28, 1999,

Proceedings
Intelligent Edge, Fog and Mist Computing
Journeys to Data Mining
Data Mining and Statistical Analysis Using SQL
Math + R + Data
Mathematical Tools for Data Mining
Fundamentals of Image Data Mining
Probability and Statistics for Data Science
Quantitative Medical Data Analysis Using Mathematical Tools and Statistical
Techniques
Concepts, Methodologies, Tools, and Applications

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RAIDEN FREDERICK

Mathematical Software

Springer

This book constitutes the thoroughly refereed conference proceedings of the 14th International Conference on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing, RSFDGrC 2013, held in Halifax, Canada in October 2013 as one of the co-located conference of the 2013 Joint Rough Set Symposium, JRS 2013. The 69 papers (including 44 regular and 25 short papers) included in the JRS proceedings (LNCS 8170 and LNCS 8171) were carefully reviewed and selected from 106 submissions. The papers

in this volume cover topics such as inconsistency, incompleteness, non-determinism; fuzzy and rough hybridization; granular computing and covering-based rough sets; soft clustering; image and medical data analysis.
Data Mining: Concepts, Methodologies, Tools, and Applications World Scientific
This book presents some recent systems engineering and mathematical tools for health care along with their real-world applications by health care practitioners and engineers. Advanced approaches, tools, and algorithms used in operating room scheduling and patient flow are covered. State-of-the-art results from applications of data mining, business process modeling, and simulation in healthcare, together

with optimization methods, form the core of the volume. Systems Analysis Tools for Better Health Care Delivery illustrates the increased need of partnership between engineers and health care professionals. This book will benefit researchers and practitioners in health care delivery institutions, staff members and professionals of specialized hospital units, and lecturers and graduate students in engineering, applied mathematics, business administration and health care.
World Scientific
"An overview of the multidisciplinary field of data mining, this book focuses specifically on new methodologies and case studies. Included are case studies written by 44 leading scientists and talented young scholars from seven different countries. Topics covered

include data mining based on rough sets, the impact of missing data, and mining free text for structure. In addition, the four basic mining operations supported by numerous mining techniques are addressed: predictive model creation supported by supervised induction techniques; link analysis supported by association discovery and sequence discovery techniques; DB segmentation supported by clustering techniques; and deviation detection supported by statistical techniques."

How Big Data Increases Inequality and Threatens Democracy World Scientific

This reader-friendly textbook presents a comprehensive review of the essentials of image data mining, and the latest cutting-edge techniques used in the field. The coverage spans all aspects of image analysis and understanding, offering deep insights into areas of feature extraction, machine learning, and image retrieval. The theoretical coverage is supported by practical mathematical models and algorithms, utilizing data from real-world examples and experiments. Topics

and features: describes the essential tools for image mining, covering Fourier transforms, Gabor filters, and contemporary wavelet transforms; reviews a varied range of state-of-the-art models, algorithms, and procedures for image mining; emphasizes how to deal with real image data for practical image mining; highlights how such features as color, texture, and shape can be mined or extracted from images for image representation; presents four powerful approaches for classifying image data, namely, Bayesian classification, Support Vector Machines, Neural Networks, and Decision Trees; discusses techniques for indexing, image ranking, and image presentation, along with image database visualization methods; provides self-test exercises with instructions or Matlab code, as well as review summaries at the end of each chapter. This easy-to-follow work illuminates how concepts from fundamental and advanced mathematics can be applied to solve a broad range of image data mining problems encountered by students and researchers of computer science.

Students of mathematics and other scientific disciplines will also benefit from the applications and solutions described in the text, together with the hands-on exercises that enable the reader to gain first-hand experience of computing.

Cloud Computing for Geospatial Big Data Analytics Walter de Gruyter GmbH & Co KG
Quantitative biomedical data analysis is a fast-growing interdisciplinary area of applied and computational mathematics, statistics, computer science, and biomedical science, leading to new fields such as bioinformatics, biomathematics, and biostatistics. In addition to traditional statistical techniques and mathematical models using differential equations, new developments with a very broad spectrum of applications, such as wavelets, spline functions, curve and surface subdivisions, sampling, and learning theory, have found their mathematical home in biomedical data analysis. This book gives a new and integrated introduction to quantitative medical data analysis from the

viewpoint of biostatisticians, and bioinformaticians. It offers a definitive resource to bridge the disciplines of mathematics, statistics, and biomedical sciences. Topics include mathematical models for cancer invasion and clinical sciences, data mining techniques and subset selection in data analysis, survival data analysis and survival models for cancer patients, statistical analysis and neural network techniques for genomic and proteomic data analysis, wavelet and spline applications for mass spectrometry data preprocessing and statistical computing. Proceedings of the First International Congress of Mathematical Software : Beijing, China, 17-19 August 2002 Springer Science & Business Media This book constitutes the refereed proceedings of the 11th International Conference on Rough Sets, Fuzzy Sets, Data Mining, and Granular Computing, RSFDGrC 2007, held in Toronto, Canada in May 2007 in conjunction with the Second International Conference on Rough Sets and Knowledge Technology, RSKT 2007,

both as part of the Joint Rough Set Symposium, JRS 2007. Spreadsheets, Databases, Matrices, and Graphs Springer Science & Business Media Data mining essentially relies on several mathematical disciplines, many of which are presented in this second edition of this book. Topics include partially ordered sets, combinatorics, general topology, metric spaces, linear spaces, graph theory. To motivate the reader a significant number of applications of these mathematical tools are included ranging from association rules, clustering algorithms, classification, data constraints, logical data analysis, etc. The book is intended as a reference for researchers and graduate students. The current edition is a significant expansion of the first edition. We strived to make the book self-contained and only a general knowledge of mathematics is required. More than 700 exercises are included and they form an integral part of the material. Many exercises are in reality supplemental material and their solutions are included.

11th International Conference, RSFDGrC 2007, Toronto, Canada, May 14-16, 2007 SIAM This volume was born from the experience of the authors as researchers and educators, which suggests that many students of data mining are handicapped in their research by the lack of a formal, systematic education in its mathematics. The data mining literature contains many excellent titles that address the needs of users with a variety of interests ranging from decision making to pattern investigation in biological data. However, these books do not deal with the mathematical tools that are currently needed by data mining researchers and doctoral students. We felt it timely to produce a book that integrates the mathematics of data mining with its applications. We emphasize that this book is about mathematical tools for data mining and not about data mining itself; despite this, a substantial amount of applications of mathematical concepts in data mining are presented. The book is intended as a reference for the working data miner. In our opinion,

three areas of mathematics are vital for data mining: set theory, including partially ordered sets and combinatorics; linear algebra, with its many applications in principal component analysis and neural networks; and probability theory, which plays a foundational role in statistics, machine learning and data mining. This volume is dedicated to the study of set-theoretical foundations of data mining. Two further volumes are contemplated that will cover linear algebra and probability theory. The first part of this book, dedicated to set theory, begins with a study of functions and relations. Application of these fundamental concepts to such issues as equivalences and partitions are discussed. Also, we prepare the ground for the following volumes by discussing indicator functions, fields and σ -fields, and other concepts.

Exploratory Data Analysis Using R

Springer Science & Business Media
Data mining aims at finding interesting, useful or profitable information in very large databases. The enormous increase in the size of available

scientific and commercial databases (data avalanche) as well as the continuing and exponential growth in performance of present day computers make data mining a very active field. In many cases, the burgeoning volume of data sets has grown so large that it threatens to overwhelm rather than enlighten scientists. Therefore, traditional methods are revised and streamlined, complemented by many new methods to address challenging new problems. Mathematical Programming plays a key role in this endeavor. It helps us to formulate precise objectives (e.g., a clustering criterion or a measure of discrimination) as well as the constraints imposed on the solution (e.g., find a partition, a covering or a hierarchy in clustering). It also provides powerful mathematical tools to build highly performing exact or approximate algorithms. This book is based on lectures presented at the workshop on "Data Mining and Mathematical Programming" (October 10-13, 2006, Montreal) and will be a valuable scientific source of information to faculty,

students, and researchers in optimization, data analysis and data mining, as well as people working in computer science, engineering and applied mathematics.

Data Science and Machine Learning

Springer

This volume presents an extensive collection of contributions covering aspects of the exciting and important research field of data mining techniques in biomedicine. Coverage includes new approaches for the analysis of biomedical data; applications of data mining techniques to real-life problems in medical practice; comprehensive reviews of recent trends in the field. The book addresses incorporation of data mining in fundamental areas of biomedical research: genomics, proteomics, protein characterization, and neuroscience.

Mathematical Statistics and Data Analysis

Cambridge University Press

This two-volume set of CCIS 307 and CCIS 308 constitutes the refereed proceedings of the Third International Conference on Information Computing and Applications, ICICA 2012, held in Chengde,

China, in September 2012. The 330 revised full papers presented in both volumes were carefully reviewed and selected from 1089 submissions. The papers are organized in topical sections on internet computing and applications; multimedia networking and computing; intelligent computing and applications; computational statistics and applications; knowledge management and applications; communication technology and applications; information management system; control engineering and applications; business intelligence and applications; cloud and evolutionary computing; computational genomics and proteomics; engineering management and applications.

Linear Algebra Tools for Data Mining Springer

This is the first text in a generation to re-examine the purpose of the mathematical statistics course. The book's approach interweaves traditional topics with data analysis and reflects the use of the computer with close ties to the practice of statistics. The author stresses analysis of data, examines real

problems with real data, and motivates the theory. The book's descriptive statistics, graphical displays, and realistic applications stand in strong contrast to traditional texts that are set in abstract settings. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Third International Conference, ICICA 2012, Chengde, China, September 14-16, 2012. Proceedings, Part II Springer Science & Business Media
 Longlisted for the National Book Award New York Times Bestseller A former Wall Street quant sounds an alarm on the mathematical models that pervade modern life -- and threaten to rip apart our social fabric We live in the age of the algorithm. Increasingly, the decisions that affect our lives-- where we go to school, whether we get a car loan, how much we pay for health insurance--are being made not by humans, but by mathematical models. In theory, this should lead to greater fairness: Everyone is judged according to the same rules, and bias is eliminated. But as Cathy

O'Neil reveals in this urgent and necessary book, the opposite is true. The models being used today are opaque, unregulated, and uncontestable, even when they're wrong. Most troubling, they reinforce discrimination: If a poor student can't get a loan because a lending model deems him too risky (by virtue of his zip code), he's then cut off from the kind of education that could pull him out of poverty, and a vicious spiral ensues. Models are propping up the lucky and punishing the downtrodden, creating a "toxic cocktail for democracy." Welcome to the dark side of Big Data. Tracing the arc of a person's life, O'Neil exposes the black box models that shape our future, both as individuals and as a society. These "weapons of math destruction" score teachers and students, sort resumes, grant (or deny) loans, evaluate workers, target voters, set parole, and monitor our health. O'Neil calls on modelers to take more responsibility for their algorithms and on policy makers to regulate their use. But in the end, it's up to us to become more savvy about the models

that govern our lives. This important book empowers us to ask the tough questions, uncover the truth, and demand change. -- Longlist for National Book Award (Non-Fiction) -- Goodreads, semi-finalist for the 2016 Goodreads Choice Awards (Science and Technology) -- Kirkus, Best Books of 2016 -- New York Times, 100 Notable Books of 2016 (Non-Fiction) -- The Guardian, Best Books of 2016 -- WBUR's "On Point," Best Books of 2016: Staff Picks -- Boston Globe, Best Books of 2016, Non-Fiction

Mathematics of Big Data
SIAM

It has been estimated that as much as 80% of the total effort in a typical data analysis project is taken up with data preparation, including reconciling and merging data from different sources, identifying and interpreting various data anomalies, and selecting and implementing appropriate treatment strategies for the anomalies that are found. This book focuses on the identification and treatment of data anomalies, including examples that highlight different types of anomalies, their potential

consequences if left undetected and untreated, and options for dealing with them. As both data sources and free, open-source data analysis software environments proliferate, more people and organizations are motivated to extract useful insights and information from data of many different kinds (e.g., numerical, categorical, and text). The book emphasizes the range of open-source tools available for identifying and treating data anomalies, mostly in R but also with several examples in Python. *Mining Imperfect Data: With Examples in R and Python, Second Edition* presents a unified coverage of 10 different types of data anomalies (outliers, missing data, inliers, metadata errors, misalignment errors, thin levels in categorical variables, noninformative variables, duplicated records, coarsening of numerical data, and target leakage). It includes an in-depth treatment of time-series outliers and simple nonlinear digital filtering strategies for dealing with them, and it provides a detailed introduction to several useful

mathematical characteristics of important data characterizations that do not appear to be widely known among practitioners, such as functional equations and key inequalities. While this book is primarily for data scientists, researchers in a variety of fields—namely statistics, machine learning, physics, engineering, medicine, social sciences, economics, and business—will also find it useful.

Information Computing and Applications
Springer Nature

This comprehensive volume presents the foundations of linear algebra ideas and techniques applied to data mining and related fields. Linear algebra has gained increasing importance in data mining and pattern recognition, as shown by the many current data mining publications, and has a strong impact in other disciplines like psychology, chemistry, and biology. The basic material is accompanied by more than 550 exercises and supplements, many accompanied with complete solutions and MATLAB applications.

Contents: Linear Algebra: Modules and Linear Spaces Matrices MATLAB Determinants Norms on Linear Spaces Inner Product Spaces Convexity Eigenvalues Similarity and Spectra Singular Values Applications: Graphs and Matrices Data Sample Matrices Least Squares Approximation and Data Mining Dimensionality Reduction Techniques The k-Means Clustering Spectral Properties of Graphs and Spectral Clustering Readership: Professionals, academics, and graduate students in pattern recognition and artificial intelligence.

Keywords: Data Mining; Linear Algebra; Machine Learning; Pattern Recognition Key Features: Integrates the mathematical developments to their applications in data mining without sacrificing the mathematical rigor Presented applications with full mathematical justifications and are often accompanied by MATLAB code Highlights strong links between linear algebra, topology and graph theory because

these links are essentially important for applications A self-contained book that deals with mathematics that is immediately relevant for data mining

Weapons of Math Destruction Universities Press

This book is not just another theoretical text on statistics or data mining. Instead, it's designed for database administrators who want to buttress their understanding of statistics to support data mining and customer relationship management analytics and who want to use Structured Query Language (SQL). Each chapter is independent and self-contained with examples tailored to business applications. Each analysis technique is expressed in a mathematical format that lends itself to coding either as a database query or as a Visual Basic procedure using SQL. Each chapter includes: formulas (how to perform the required analysis, numerical example using data from a database, data visualization and presentation options (graphs, charts, tables), SQL procedures for extracting the desired results, and data mining

techniques.

Mathematics for Machine Learning
Springer Science & Business Media

"This textbook is a well-rounded, rigorous, and informative work presenting the mathematics behind modern machine learning techniques. It hits all the right notes: the choice of topics is up-to-date and perfect for a course on data science for mathematics students at the advanced undergraduate or early graduate level. This book fills a sorely-needed gap in the existing literature by not sacrificing depth for breadth, presenting proofs of major theorems and subsequent derivations, as well as providing a copious amount of Python code. I only wish a book like this had been around when I first began my journey!" - Nicholas Hoell, University of Toronto

"This is a well-written book that provides a deeper dive into data-scientific methods than many introductory texts. The writing is clear, and the text logically builds up regularization, classification, and decision trees. Compared to its probable competitors, it carves out a unique niche. -Adam

Loy, Carleton College The purpose of Data Science and Machine Learning: Mathematical and Statistical Methods is to provide an accessible, yet comprehensive textbook intended for students interested in gaining a better understanding of the mathematics and statistics that underpin the rich variety of ideas and machine learning algorithms in data science. Key Features: Focuses on mathematical understanding. Presentation is self-contained, accessible, and comprehensive. Extensive list of exercises and worked-out examples. Many concrete algorithms with Python code. Full color throughout. The Authors: Dirk P. Kroese, PhD, is a Professor of Mathematics and Statistics at The University of Queensland. He has published over 120 articles and five books in a wide range of areas in mathematics, statistics, data science, machine learning, and Monte Carlo methods. He is a pioneer of the well-known Cross-Entropy method—an adaptive Monte Carlo technique, which is being used around the world to help solve difficult estimation and optimization

problems in science, engineering, and finance. Zdravko Botev, PhD, is an Australian Mathematical Science Institute Lecturer in Data Science and Machine Learning with an appointment at the University of New South Wales in Sydney, Australia. He is the recipient of the 2018 Christopher Heyde Medal of the Australian Academy of Science for distinguished research in the Mathematical Sciences. Thomas Taimre, PhD, is a Senior Lecturer of Mathematics and Statistics at The University of Queensland. His research interests range from applied probability and Monte Carlo methods to applied physics and the remarkably universal self-mixing effect in lasers. He has published over 100 articles, holds a patent, and is the coauthor of Handbook of Monte Carlo Methods (Wiley). Radislav Vaisman, PhD, is a Lecturer of Mathematics and Statistics at The University of Queensland. His research interests lie at the intersection of applied probability, machine learning, and computer science. He has published over 20 articles and two books. Mathematical Tools for

Data Mining Academic Press

This book constitutes the refereed proceedings of the Third Pacific-Asia Conference on Knowledge Discovery and Data Mining, PAKDD '99, held in Beijing, China, in April 1999. The 29 revised full papers presented together with 37 short papers were carefully selected from a total of 158 submissions. The book is divided into sections on emerging KDD technology; association rules; feature selection and generation; mining in semi-unstructured data; interestingness, surprisingness, and exceptions; rough sets, fuzzy logic, and neural networks; induction, classification, and clustering; visualization; causal models and graph-based methods; agent-based and distributed data mining; and advanced topics and new methodologies.

Mining Imperfect Data
IGI Global

It is a great privilege and pleasure to write a foreword for a book honoring Wolfgang Gaul on the occasion of his sixtieth birthday. Wolfgang Gaul is currently Professor of Business Administration and Management Science and the Head of the

Institute of Decision Theory and Management Science, Faculty of Economics, University of Karlsruhe (TH), Germany. He is, by any measure, one of the most distinguished and eminent scholars in the world today. Wolfgang Gaul has been instrumental in numerous leading research initiatives and has achieved an unprecedented level of success in facilitating communication among researchers in diverse disciplines from around the world. A particularly remarkable and unique aspect of his work is that he has been a leading scholar in such diverse areas of research as

graph theory and network models, reliability theory, stochastic theory, optimization, operations research, probability theory, sampling theory, cluster analysis, scaling and multivariate data analysis. His activities have been directed not only at these and other theoretical topics, but also at applications of statistical and mathematical tools to a multitude of important problems in computer science (e.g., w-mining), business research (e.g., market segmentation), management science (e.g., decision support systems) and behavioral sciences (e.g., preference

measurement and data mining). All of his endeavors have been accomplished at the highest level of professional excellence. Mathematical and Statistical Methods Springer Science & Business Media
This graduate text covers a variety of mathematical and statistical tools for the analysis of big data coming from biology, medicine and economics. Neural networks, Markov chains, tools from statistical physics and wavelet analysis are used to develop efficient computational algorithms, which are then used for the processing of real-life data using Matlab.