

## [MOBI] Music Data Mining Chapman Hallrc Data Mining And Knowledge Discovery Series

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Music Data Mining-Tao Li 2011-07-12 The research area of music information retrieval has gradually evolved to address the challenges of effectively accessing and interacting large collections of music and associated data, such as styles, artists, lyrics, and reviews. Bringing together an interdisciplinary array of top researchers, Music Data Mining presents a variety of approaches to successfully employ data mining techniques for the purpose of music processing. The book first covers music data mining tasks and algorithms and audio feature extraction, providing a framework for subsequent chapters. With a focus on data classification, it then describes a computational approach inspired by human auditory perception and examines instrument recognition, the effects of music on moods and emotions, and the connections between power laws and music aesthetics. Given the importance of social aspects in understanding music, the text addresses the use of the Web and peer-to-peer networks for both music data mining and evaluating music mining tasks and algorithms. It also discusses indexing with tags and explains how data can be collected using online human computation games. The final chapters offer a balanced exploration of hit song science as well as a look at symbolic musicology and data mining. The multifaceted nature of music information often requires algorithms and systems using sophisticated signal processing and machine learning techniques to better extract useful information. An excellent introduction to the field, this volume presents state-of-the-art techniques in music data mining and information retrieval to create novel ways of interacting with large music collections.

Music Data Analysis-Claus Weihs 2016-11-17 This book provides a comprehensive overview of music data analysis, from introductory material to advanced concepts. It covers various applications including transcription and segmentation as well as chord and harmony, instrument and tempo recognition. It also discusses the implementation aspects of music data analysis such as architecture, user interface and hardware. It is ideal for use in university classes with an interest in music data analysis. It also could be used in computer science and statistics as well as musicology.

Temporal Data Mining-Theophano Mitsa 2010-03-10 Temporal data mining deals with the harvesting of useful information from temporal data. New initiatives in health care and business organizations have increased the importance of temporal information in data today. From basic data mining concepts to state-of-the-art advances, Temporal Data Mining covers the theory of this subject as well as its application in a variety of fields. It discusses the incorporation of temporality in databases as well as temporal data representation, similarity computation, data classification, clustering, pattern discovery, and prediction. The book also explores the use of temporal data mining in medicine and biomedical informatics, business and industrial applications, web usage mining, and spatiotemporal data mining. Along with various state-of-the-art algorithms, each chapter includes detailed references and short descriptions of relevant algorithms and techniques described in other references. In the appendices, the author explains how data mining fits the overall goal of an organization and how these data can be interpreted for the purpose of characterizing a population. She also provides programs written in the Java language that implement some of the algorithms presented in the first chapter. Check out the author's blog at http://theophanmitsa.wordpress.com/

Spectral Feature Selection for Data Mining (Open Access)-Zheng Alan Zhao 2011-12-14 Spectral Feature Selection for Data Mining introduces a novel feature selection technique that establishes a general platform for studying existing feature selection algorithms and developing new algorithms for emerging problems in real-world applications. This technique represents a unified framework for supervised, unsupervised, and semisupervise

Music Data Analysis-Claus Weihs 2016-11-17 This book provides a comprehensive overview of music data analysis, from introductory material to advanced concepts. It covers various applications including transcription and segmentation as well as chord and harmony, instrument and tempo recognition. It also discusses the implementation aspects of music data analysis such as architecture, user interface and hardware. It is ideal for use in university classes with an interest in music data analysis. It also could be used in computer science and statistics as well as musicology.

The Top Ten Algorithms in Data Mining-Xindong Wu 2009-04-09 Identifying some of the most influential algorithms that are widely used in the data mining community, The Top Ten Algorithms in Data Mining provides a description of each algorithm, discusses its impact, and reviews current and future research. Thoroughly evaluated by independent reviewers, each chapter focuses on a particular algorithm and is written by either the original authors of the algorithm or world-class researchers who have extensively studied the respective algorithm. The book concentrates on the following important algorithms: C4.5, k-Means, SVM, Apriori, EM, PageRank, AdaBoost, kNN, Naive Bayes, and CART. Examples illustrate how each algorithm works and highlight its overall performance in a real-world application. The text covers key topics—including classification, clustering, statistical learning, association analysis, and link mining—in data mining research and development as well as in data mining, machine learning, and artificial intelligence courses. By listing the leading algorithms in this field, this book encourages the use of data mining techniques in a broader realm of real-world applications. It should inspire more data mining researchers to further explore the impact and novel research issues of these algorithms.

Data Mining with R-Luis Torgo 2016-11-30 Data Mining with R: Learning with Case Studies, Second Edition uses practical examples to illustrate the power of R and data mining. Providing an extensive update to the best-selling first edition, this new edition is divided into two parts. The first part will feature introductory material, including a new chapter that provides an introduction to data mining, to complement the already existing introduction to R. The second part includes case studies, and the new edition strongly revises the R code of the case studies making it more up-to-date with recent packages that have emerged in R. The book does not assume any prior knowledge about R. Readers who are new to R and data mining should be able to follow the case studies, and they are designed to be self-contained so the reader can start anywhere in the document. The book is accompanied by a set of freely available R source files that can be obtained at the book's web site. These files include all the code used in the case studies, and they facilitate the "do-it-yourself" approach followed in the book. Designed for users of data analysis tools, as well as researchers and developers, the book should be useful for anyone interested in entering the "world" of R and data mining. About the Author Luis Torgo is an associate professor in the Department of Computer Science at the University of Porto in Portugal. He teaches Data Mining in R in the NYU Stern School of Business' MS in Business Analytics program. An active researcher in machine learning and data mining for more than 20 years, Dr. Torgo is also a researcher in the Laboratory of Artificial Intelligence and Data Analysis (LIAAD) of INESC Porto LA.

Next Generation of Data Mining-Hilool Kargupta 2008-12-24 Drawn from the US National Science Foundation's Symposium on Next Generation of Data Mining and Cyber-Enabled Discovery for Innovation (NGDM 07), Next Generation of Data Mining explores emerging technologies and applications in data mining as well as potential challenges faced by the field. Gathering perspectives from top experts across different disciplines, the book debates upcoming challenges and outlines computational methods. The contributors look at how ecology, astronomy, social science, medicine, finance, and more can benefit from the next generation of data mining techniques. They examine the algorithms, middleware, infrastructure, and privacy policies associated with ubiquitous, distributed, and high performance data mining. They also discuss the impact of new technologies, such as the semantic web, on data mining and provide recommendations for privacy-preserving mechanisms. The dramatic increase in the availability of massive, complex data from various sources is creating computing, storage, communication, and human-computer interaction challenges for data mining. Providing a framework to better understand these fundamental issues, this volume surveys promising approaches to data mining problems that span an array of disciplines.

Handbook of Educational Data Mining-Cristobal Romero 2010-10-25 Handbook of Educational Data Mining (EDM) provides a thorough overview of the current state of knowledge in this area. The first part of the book includes nine surveys and tutorials on the principal data mining techniques that have been applied in education. The second part presents a set of 25 case studies that give a rich overview of the problems that EDM has addressed. Researchers at the Forefront of the Field Discuss Essential Topics and the Latest Advances With contributions by well-known researchers from a variety of fields, the book reflects the multidisciplinary nature of the EDM community. It brings the educational and data mining communities together, helping education experts understand what types of questions EDM can address and helping data miners understand what types of questions are important to educational design and educational decision making. Encouraging readers to integrate EDM into their research and practice, this timely handbook offers a broad, accessible treatment of essential EDM techniques and applications. It provides an excellent first step for newcomers to the EDM community and for active researchers to keep abreast of recent developments in the field.

Music Similarity and Retrieval-Peter Knees 2016-05-28 This book provides a summary of the manifold audio- and web-based approaches to music information retrieval (MIR) research. In contrast to other books dealing solely with music signal processing, it addresses additional cultural and listener-centric aspects and thus provides a more holistic view. Consequently, the text includes methods operating on features extracted directly from the audio signal, as well as methods operating on features extracted from contextual information, either the cultural context of music as represented on the web or the user and usage context of music. Following the prevalent document-centered paradigm of information retrieval, the book addresses models of music similarity that extract computational features to describe an entity that represents music on any level (e.g., song, album, or artist), and methods to calculate the similarity between them. While this perspective and the representations discussed cannot describe all musical dimensions, they enable us to effectively find music of similar qualities by providing abstract summarizations of musical artifacts from different modalities. The text at hand provides a comprehensive and accessible introduction to the topics of music search, retrieval, and recommendation from an academic perspective. It will not only allow those new to the field to quickly access MIR from an information retrieval point of view but also raise awareness for the developments of the music domain within the greater IR community. In this regard, Part I deals with content-based MIR, in particular the extraction of features from the music signal and similarity calculation for content-based retrieval. Part II subsequently addresses MIR methods that make use of the digitally accessible cultural context of music. Part III addresses methods of collaborative filtering and user-aware and multi-modal retrieval, while Part IV explores current and future applications of music retrieval and recommendation .>

Biological Data Mining-Jake Y. Chen 2009-09-01 Like a data-guzzling turbo engine, advanced data mining has been powering post-genome biological studies for two decades. Reflecting this growth, Biological Data Mining presents comprehensive data mining concepts, theories, and applications in current biological and medical research. Each chapter is written by a distinguished team of interdisciplinary data mining researchers who cover state-of-the-art biological topics. The first section of the book discusses challenges and opportunities in analyzing and mining biological sequences and structures to gain insight into molecular functions. The second section addresses emerging computational challenges in interpreting high-throughput Omics data. The book then describes the relationships between data mining and related areas of computing, including knowledge representation, information retrieval, and data integration for structured and unstructured biological data. The last part explores emerging data mining opportunities for biomedical applications. This volume examines the concepts, problems, progress, and trends in developing and applying new data mining techniques to the rapidly growing field of genome biology. By studying the concepts and case studies presented, readers will gain significant insight and develop practical solutions for similar biological data mining projects in the future.

Text Mining-Ashok N. Srivastava 2009-06-15 The Definitive Resource on Text Mining Theory and Applications from Foremost Researchers in the Field Giving a broad perspective of the field from numerous vantage points, Text Mining: Classification, Clustering, and Applications focuses on statistical methods for text mining and analysis. It examines methods to automatically cluster and classify text documents and applies these methods in a variety of areas, including adaptive information filtering, information distillation, and text search. The book begins with chapters on the classification of documents into predefined categories. It presents state-of-the-art algorithms and their use in practice. The next chapters describe novel methods for clustering documents into groups that are not predefined. These methods seek to automatically determine topical structures that may exist in a document corpus. The book concludes by discussing various text mining applications that have significant implications for future research and industrial use. There is no doubt that text mining will continue to play a critical role in the development of future information systems and advances in research will be instrumental to their success. This book captures the technical depth and immense practical potential of text mining, guiding readers to a sound appreciation of this burgeoning field.

Clustering for Data Mining-Boris Mirkin 2005-04-29 Often considered more as an art than a science, the field of clustering has been dominated by learning through examples and by techniques chosen almost through trial-and-error. Even the most popular clustering methods--K-Means for partitioning the data set and Ward's method for hierarchical clustering--have lacked the theoretical attention that wou Knowledge Discovery from Data Streams-Joao Gama 2010-05-25 Since the beginning of the Internet age and the increased use of ubiquitous computing devices, the large volume and continuous flow of distributed data have imposed new constraints on the design of learning algorithms. Exploring how to extract knowledge structures from evolving and time-changing data, Knowledge Discovery from Data Streams presents a coherent overview of state-of-the-art research in learning from data streams. The book covers the fundamentals that are imperative to understanding data streams and describes important applications, such as TCP/IP traffic, GPS data, sensor networks, and customer click streams. It also addresses several challenges of data mining in the future, when stream mining will be at the core of many applications. These challenges involve designing useful and efficient data mining solutions applicable to real-world problems. In the appendix, the author includes examples of publicly available software and online data sets. This practical, up-to-date book focuses on the new requirements of the next generation of data mining. Although the concepts presented in the text are mainly about data streams, they also are valid for different areas of machine learning and data mining.

Geographic Data Mining and Knowledge Discovery-Harvey J. Miller 2009-05-27 The Definitive Volume on Cutting-Edge Exploratory Analysis of Massive Spatial and Spatiotemporal DatabasesSince the publication of the first edition of Geographic Data Mining and Knowledge Discovery, new techniques for geographic data warehousing (GDW), spatial data mining, and geovisualization (GVIs) have been developed. In addition, there has been Data Mining for Design and Marketing-Yukio Ohsawa 2009-01-26 Data Mining for Design and Marketing shows how to design and integrate data mining tools into human thinking processes in order to make better business decisions, especially in designing and marketing products and systems. The expert contributors discuss how data mining can identify valuable consumer patterns, which aid marketers and designers in detecting consumers' needs. They also explore visualization tools based on the computational methods of data mining. Discourse analysis, chance discovery, knowledge discovery, formal concept analysis, and an adjacency matrix are just some of the novel approaches covered. The book explains how these methods can be applied to website design, the retrieval of scientific articles from a database, personalized e-commerce support tools, and more. Through the techniques of data mining, this book demonstrates how to effectively design business processes and develop competitive products and services. By embracing data mining tools, businesses can better understand the behavior and needs of their customers.

Mining Software Specifications-David Lo 2011-05-24 An emerging topic in software engineering and data mining, specification mining tackles software maintenance and reliability issues that cost economies billions of dollars each year. The first unified reference on the subject, Mining Software Specifications: Methodologies and Applications describes recent approaches for mining specifications of sof Event Mining-Tao Li 2015-10-15 Event mining encompasses techniques for automatically and efficiently extracting valuable knowledge from historical event/log data. The field, therefore, plays an important role in data-driven system management. Event Mining: Algorithms and Applications presents state-of-the-art event mining approaches and applications with a focus on computing system management. The book first explains how to transform log data in disparate formats and contents into a canonical form as well as how to optimize system monitoring. It then shows how to extract useful knowledge from data. It describes intelligent and efficient methods and algorithms to perform data-driven pattern discovery and problem determination for managing complex systems. The book also discusses data-driven approaches for the detailed diagnosis of a system issue and addresses the application of event summarization in Twitter messages (tweets). Understanding the interdisciplinary field of event mining can be challenging as it requires familiarity with several research areas and the relevant literature is scattered in diverse publications. This book makes it easier to explore the field by providing both a good starting point for readers not familiar with the topics and a comprehensive reference for those already working in this area.

Healthcare Data Analytics-Chandan K. Reddy 2015-06-23 At the intersection of computer science and healthcare, data analytics has emerged as a promising tool for solving problems across many healthcare-related disciplines. Supplying a comprehensive overview of recent healthcare analytics research, Healthcare Data Analytics provides a clear understanding of the analytical techniques currently available to solve healthcare problems. The book details novel techniques for acquiring, handling, retrieving, and making best use of healthcare data. It analyzes recent developments in healthcare computing and discusses emerging technologies that can help improve the health and well-being of patients. Written by prominent researchers and experts working in the healthcare domain, the book sheds light on many of the computational challenges in the field of medical informatics. Each chapter in the book is structured as a "survey-style" article discussing the prominent research issues and the advances made on that research topic. The book is divided into three major categories: Healthcare Data Sources and Basic Analytics - details the various healthcare data sources and analytical techniques used in the processing and analysis of such data Advanced Data Analytics for Healthcare - covers advanced analytical methods, including clinical prediction models, temporal pattern mining methods, and visual analytics Applications and Practical Systems for Healthcare - covers the applications of data analytics to pervasive healthcare, fraud detection, and drug discovery along with systems for medical imaging and decision support Computer scientists are usually not trained in domain-specific medical concepts, whereas medical practitioners and researchers have limited exposure to the data analytics area. The contents of this book will help to bring together these diverse communities by carefully and comprehensively discussing the most relevant contributions from each domain.

Mining User Generated Content-Marie-Francine Moens 2014-01-28 Originating from Facebook, LinkedIn, Twitter, Instagram, YouTube, and many other networking sites, the social media shared by users and the associated metadata are collectively known as user generated content (UGC). To analyze UGC and glean insight about user behavior, robust techniques are needed to tackle the huge amount of real-time, multimedia, and multilingual data. Researchers must also know how to assess the social aspects of UGC, such as user relations and influential users. Mining User Generated Content is the first focused effort to compile state-of-the-art research and address future directions of UGC. It explains how to collect, index, and analyze UGC to uncover social trends and user habits. Divided into four parts, the book focuses on the mining and applications of UGC. The first part presents an introduction to this new and exciting topic. Covering the mining of UGC of different medium types, the second part discusses the social annotation of UGC, social network graph construction and community mining, mining of UGC to assist in music retrieval, and the popular but difficult topic of UGC sentiment analysis. The third part describes the mining and searching of various types of UGC, including knowledge extraction, search techniques for UGC content, and a specific study on the analysis and annotation of Japanese blogs. The fourth part on applications explores the use of UGC to support question-answering, information summarization, and recommendations.

Data Clustering-Charu C. Aggarwal 2018-09-03 Research on the problem of clustering tends to be fragmented across the pattern recognition, database, data mining, and machine learning communities. Addressing this problem in a unified way, Data Clustering: Algorithms and Applications provides complete coverage of the entire area of clustering, from basic methods to more refined and complex data clustering approaches. It pays special attention to recent issues in graphs, social networks, and other domains. The book focuses on three primary aspects of data clustering: Methods, describing key techniques commonly used for clustering, such as feature selection, agglomerative clustering, partitionial clustering, density-based clustering, probabilistic clustering, grid-based clustering, spectral clustering, and nonnegative matrix factorization Domains, covering methods used for different domains of data, such as categorical data, text data, multimedia data, graph data, biological data, stream data, uncertain data, time series clustering, high-dimensional clustering, and big data Variations and Insights, discussing important variations of the clustering process, such as semisupervised clustering, interactive clustering, multiview clustering, cluster ensembles, and cluster validation In this book, top researchers from around the world explore the characteristics of clustering problems in a variety of application areas. They also explain how to glean detailed insight from the clustering process—including how to verify the quality of the underlying clusters—through supervision, human intervention, or the automated generation of alternative clusters.

Statistics in Musicology-Jan Beran 2003-07-15 Traditionally, statistics and music are not generally associated with each other. However, ...intelligent... music software, computer digitization, and other advanced techniques and technologies have precipitated the need for standard statistical models to answer basic musicological questions. Statistics In Musicology presents an unprecedented introduction to statistical and mathematical methods developed for use in music analysis, music theory, and performance theory. It explores concrete methods for data generation and numerical encoding of musical data and serves as a practical reference for a wide audience, including statisticians, mathematicians, musicologists, and musicians.

Data Classification-Charu C. Aggarwal 2014-07-25 Comprehensive Coverage of the Entire Area of ClassificationResearch on the problem of classification tends to be fragmented across such areas as pattern recognition, database, data mining, and machine learning. Addressing the work of these different communities in a unified way, Data Classification: Algorithms and Applications explores the underlyi

Advances in Machine Learning and Data Mining for Astronomy-Michael J. Way 2012-03-29 Advances in Machine Learning and Data Mining for Astronomy documents numerous successful collaborations among computer scientists, statisticians, and astronomers who illustrate the application of state-of-the-art machine learning and data mining techniques in astronomy. Due to the massive amount and complexity of data in most scientific disciplines

Feature Engineering for Machine Learning and Data Analytics-Guozhu Dong 2018-03-14 Feature engineering plays a vital role in big data analytics. Machine learning and data mining algorithms cannot work without data. Little can be achieved if there are few features to represent the underlying data objects, and the quality of results of those algorithms largely depends on the quality of the available features. Feature Engineering for Machine Learning and Data Analytics provides a comprehensive introduction to feature engineering, including feature generation, feature extraction, feature transformation, feature selection, and feature analysis and evaluation. The book presents key concepts, methods, examples, and applications, as well as chapters on feature engineering for major data types such as texts, images, sequences, time series, graphs, streaming data, software engineering data, Twitter data, and social media data. It also contains generic feature generation approaches, as well as methods for generating tried-and-tested, hand-crafted, domain-specific features. The first chapter defines the concepts of features and feature engineering, offers an overview of the book, and provides pointers to topics not covered in this book. The next six chapters are devoted to feature engineering, including feature generation for specific data types. The subsequent four chapters cover generic approaches for feature engineering, namely feature selection, feature transformation based feature engineering, deep learning based feature engineering, and pattern based feature generation and engineering. The last three chapters discuss feature engineering for social bot detection, software management, and Twitter-based applications respectively. This book can be used as a reference for data analysts, big data scientists, data preprocessing workers, project managers, project developers, prediction modelers, professors, researchers, graduate students, and upper level undergraduate students. It can also be used as the primary text for courses on feature engineering, or as a supplement for courses on machine learning, data mining, and big data analytics.

Data Mining-Richard J. Roiger 2017-01-06 Data Mining: A Tutorial-Based Primer, Second Edition provides a comprehensive introduction to data mining with a focus on model building and testing, as well as on interpreting and validating results. The text guides students to understand how data mining can be employed to solve real problems and recognize whether a data mining solution is a feasible alternative for a specific problem. Fundamental data mining strategies, techniques, and evaluation methods are presented and implemented with the help of two well-known software tools. Several new topics have been added to the second edition including an introduction to Big Data and data analytics, ROC curves, Pareto lift charts, methods for handling large-sized, streaming and imbalanced data, support vector machines, and extended coverage of textual data mining. The second edition contains tutorials for attribute selection, dealing with imbalanced data, outlier analysis, time series analysis, mining textual data, and more. The text provides in-depth coverage of RapidMiner Studio and Weka's Explorer interface. Both software tools are used for stepping students through the tutorials depicting the knowledge discovery process. This allows the reader maximum flexibility for their hands-on data mining experience.

Data Mining: Concepts and Techniques-Jiawei Han 2011-06-09 Data Mining: Concepts and Techniques provides the concepts and techniques in processing gathered data or information, which will be used in various applications. Specifically, it explains data mining and the tools used in discovering knowledge from the collected data. This book is referred as the knowledge discovery from data (KDD). It focuses on the feasibility, usefulness, effectiveness, and scalability of techniques of large data sets. After describing data mining, this edition explains the methods of knowing, preprocessing, processing, and warehousing data. It then presents information about data warehouses, online analytical processing (OLAP), and data cube technology. Then, the methods involved in mining frequent patterns, associations, and correlations for large data sets are described. The book details the methods for data classification and introduces the concepts and methods for data clustering. The remaining chapters discuss the outlier detection and the trends, applications, and research frontiers in data mining. This book is intended for Computer Science students, application developers, business professionals, and researchers who seek information on data mining. Presents dozens of algorithms and implementation examples, all in pseudo-code and suitable for use in real-world, large-scale data mining projects Addresses advanced topics such as mining object-relational databases, spatial databases, multimedia databases, time-series databases, text databases, the World Wide Web, and applications in several fields Provides a comprehensive, practical look at the concepts and techniques you need to get the most out of your data

Introduction to Python Programming-Gowrishankar S 2018-11-05 Python is a free general purpose programming language with a beautiful syntax. The topics in the book have been carefully selected to give good exposure to almost all the core concepts of the Python Programming language helping students as well as professionals in getting off the ground quickly.

Music Emotion Recognition-Yi-Hsuan Yang 2011-02-22 Providing a complete review of existing work in music emotion developed in psychology and engineering, Music Emotion Recognition explains how to account for the subjective nature of emotion perception in the development of automatic music emotion recognition (MER) systems. Among the first publications dedicated to automatic MER, it begins with

Ensemble Methods-Zhi-Hua Zhou 2012-06-06 An up-to-date, self-contained introduction to a state-of-the-art machine learning approach, Ensemble Methods: Foundations and Algorithms shows how these accurate methods are used in real-world tasks. It gives you the necessary groundwork to carry out further research in this evolving field. After presenting background and terminology, the book covers the main algorithms and theories, including Boosting, Bagging, Random Forest, averaging and voting schemes, the Stacking method, mixture of experts, and diversity measures. It also discusses multiclass extension, noise tolerance, error-ambiguity and bias-variance decompositions, and recent progress in information theoretic diversity. Moving on to more advanced topics, the author explains how to achieve better performance through ensemble pruning and how to generate better clustering results by combining multiple clusterings. In addition, he describes developments of ensemble methods in semi-supervised learning, active learning, cost-sensitive learning, class-imbalance learning, and comprehensibility enhancement.

Customer and Business Analytics-Daniel S. Putter 2015-09-15 Customer and Business Analytics: Applied Data Mining for Business Decision Making Using R explains and demonstrates, via the accompanying open-source software, how advanced analytical tools can address various business problems. It also gives insight into some of the challenges faced when deploying these tools. Extensively classroom-tested, the text is ideal for students in customer and business analytics or applied data mining as well as professionals in small- to medium-sized organizations. The book offers an intuitive understanding of how different analytics algorithms work. Where necessary, the authors explain the underlying mathematics in an accessible manner. Each technique presented includes a detailed tutorial that enables hands-on experience with real data. The authors also discuss issues often encountered in applied data mining projects and present the CRISP-DM process model as a practical framework for organizing these projects. Showing how data data mining can improve the performance of organizations, this book and its R-based software provide the skills and tools needed to successfully develop advanced analytics capabilities.

Multilinear Subspace Learning-Haiping Lu 2013-12-11 Due to advances in sensor, storage, and networking technologies, data is being generated on a daily basis at an ever-increasing pace in a wide range of applications, including cloud computing, mobile Internet, and medical imaging. This large multidimensional data requires more efficient dimensionality reduction schemes than the traditional techniques. Addressing this need, multilinear subspace learning (MSL) reduces the dimensionality of big data directly from its natural multidimensional representation, a tensor. Multilinear Subspace Learning: Dimensionality Reduction of Multidimensional Data gives a comprehensive introduction to both theoretical and practical aspects of MSL for the dimensionality reduction of multidimensional data based on tensors. It covers the fundamentals, algorithms, and applications of MSL. Emphasizing essential concepts and system-level perspectives, the authors provide a foundation for solving many of today's most interesting and challenging problems in big multidimensional data processing. They trace the history of MSL, detail recent advances, and explore future developments and emerging applications. The book follows a unifying MSL framework formulation to systematically derive representative MSL algorithms. It describes various applications of the algorithms, along with their pseudocode. Implementation tips help practitioners in further development, evaluation, and application. The book also provides researchers with useful theoretical information on big multidimensional data in machine learning and pattern recognition. MATLAB® source code, data, and other materials are available at www.comp.hkbu.edu.hk/~haiping/MSL.html

Automated Data Analysis Using Excel-Brian D. Bissett 2007-06-15 Because the analysis of copious amounts of data and the preparation of custom reports often take away time from true research, the automation of these processes is paramount to ensure productivity. Exploring the core areas of automation, report generation, data acquisition, and data analysis, Automated Data Analysis Using Excel illustrates how to minimize user intervention, automate parameter setup, obtain consistency in both analysis and reporting, and save time through automation. Focusing on the built-in Visual Basic® for Applications (VBA) scripting language of Excel®, the book shows step-by-step how to construct useful automated data analysis applications for both industrial and academic settings. It begins by discussing fundamental elements, the methods for importing and accessing data, and the creation of reports. The author then describes how to use Excel to obtain data from non-native sources, such as databases and third-party calculation tools. After providing the means to access any required information, the book explains how to automate manipulations and calculations on the acquired data sources. Collecting all of the concepts previously discussed in the book, the final chapter demonstrates from beginning to end how to create a cohesive, robust application. With an understanding of this book, readers should be able to construct applications that can import data from a variety of sources, apply algorithms to data that has been imported, and create meaningful reports based on the results.

Foundations of Predictive Analytics-James Wu 2012-02-15 Drawing on the authors' two decades of experience in applied modeling and data mining, Foundations of Predictive Analytics presents the fundamental background required for analyzing data and building models for many practical applications, such as consumer behavior modeling, risk and marketing analytics, and other areas. It also discusses a variety of practical topics that are frequently missing from similar texts. The book begins with the statistical and linear algebra/matrix foundation of modeling methods, from distributions to cumulant and copula functions to Cornish-Fisher expansion and other useful but hard-to-find statistical techniques. It then describes common and unusual linear methods as well as popular nonlinear modeling approaches, including additive models, trees, support vector machine, fuzzy systems, clustering, naïve Bayes, and neural nets. The authors go on to cover methodologies used in time series and forecasting, such as ARIMA, GARCH, and survival analysis. They also present a range of optimization techniques and explore several special topics, such as Dempster-Shafer theory. An in-depth collection of the most important fundamental information on predictive analytics, this self-contained book provides the necessary information for understanding various techniques for exploratory data analysis and modeling. It explains the algorithmic details behind each technique (including underlying assumptions and mathematical formulations) and shows how to prepare and encode data, select variables, use model goodness measures, normalize odds, and perform reject inference. Web Resource The book's website at www.DataMinerXL.com offers the DataMinerXL software for building predictive models. The site also includes more examples and information on modeling.

Basketball Data Science-Paola Zuccolotto 2020-01-21 Using data from one season of NBA games, Basketball Data Science: With Applications in R is the perfect book for anyone interested in learning and applying data analytics in basketball. Whether assessing the spatial performance of an MBA player's shots or doing an analysis of the impact of high pressure game situations on the probability of scoring, this book discusses a variety of case studies and hands-on examples using a custom R package. The codes are supplied so readers can reproduce the analyses themselves or create their own. Assuming a basic statistical knowledge, Basketball Data Science with R is suitable for students, technicians, coaches, data analysts and applied researchers. Features: - One of the first books to provide statistical and data mining methods for the growing field of analytics in basketball. - Presents tools for modelling graphs and figures to visualize the data. - Includes real world case studies and examples, such as estimations of scoring probability using the Golden State Warriors as a test case. - Provides the source code and data so readers can do their own analyses on NBA teams and players.

Practical Graph Mining with R-Nagiza F. Samatova 2013-07-15 Discover Novel and Insightful Knowledge from Data Represented as a GraphPractical Graph Mining with R presents a "do-it-yourself" approach to extracting interesting patterns from graph data. It covers many basic and advanced techniques for the identification of anomalous or frequently recurring patterns in a graph, the discovery of groups or cluste Understanding Complex Datasets-David Skillicorn 2007-05-17 Making obscure knowledge about matrix decompositions widely available, Understanding Complex Datasets: Data Mining with Matrix Decompositions discusses the most common matrix decompositions and shows how they can be used to analyze large datasets in a broad range of application areas. Without having to understand every mathematical detail, the book helps you determine which matrix is appropriate for your dataset and what the results mean. Explaining the effectiveness of matrices as data analysis tools, the book illustrates the ability of matrix decompositions to provide more powerful analyses and to produce cleaner data than more mainstream techniques. The author explores the deep connections between matrix decompositions and structures within graphs, relating the PageRank algorithm of Google's search engine to singular value decomposition. He also covers dimensionality reduction, collaborative filtering, clustering, and spectral analysis. With numerous figures and examples, the book shows how matrix decompositions can be used to find documents on the Internet, look for deeply buried mineral deposits without drilling, explore the structure of proteins, detect suspicious emails or cell phone calls, and more. Concentrating on data mining mechanics and applications, this resource helps you model large, complex datasets and investigate connections between standard data mining techniques and matrix decompositions.

Statistical Computing with R-Maria L. Rizzo 2007-11-15 Computational statistics and statistical computing are two areas that employ computational, graphical, and numerical approaches to solve statistical problems, making the versatile R language an ideal computing environment for these fields. One of the first books on these topics to feature R, Statistical Computing with R covers the traditioa

The Essentials of Data Science: Knowledge Discovery Using R-Graham J. Williams 2017-07-28 The Essentials of Data Science: Knowledge Discovery Using R presents the concepts of data science through a hands-on approach using free and open source software. It systematically drives an accessible journey through data analysis and machine learning to discover and share knowledge from data. Building on over thirty years' experience in teaching and practising data science, the author encourages a programming-by-example approach to ensure students and practitioners attain to the practise of data science while building their data skills. Proven frameworks are provided as reusable templates. Real world case studies then provide insight for the data scientist to swiftly adapt the templates to new tasks and datasets. The book begins by introducing data science. It then reviews R's capabilities for analysing data by writing computer programs. These programs are developed and explained step by step. From analysing and visualising data, the framework moves on to tried and tested machine learning techniques for predictive modelling and knowledge discovery. Literate programming and a consistent style are a focus throughout the book.

R for Political Data Science-Francisco Urdinez 2020-11-17 R for Political Data Science: A Practical Guide is a handbook for political scientists new to R who want to learn the most useful and common ways to interpret and analyze political data. It was written by political scientists, thinking about the many real-world problems faced in their work. The book has 16 chapters and is organized in three sections. The first, on the use of R, is for those users who are learning R or are migrating from

another software. The second section, on econometric models, covers OLS, binary and survival models, panel data, and causal inference. The third section is a data science toolbox of some the most useful tools in the discipline: data imputation, fuzzy merge of large datasets, web mining, quantitative text analysis, network analysis, mapping, spatial cluster analysis, and principal component analysis. Key features: Each chapter has the most up-to-date and simple option available for each task, assuming minimal prerequisites and no previous experience in R Makes extensive use of the Tidyverse, the group of packages that has revolutionized the use of R Provides a step-by-step guide that you can replicate using your own data Includes exercises in every chapter for course use or self-study Focuses on practical-based approaches to statistical inference rather than mathematical formulae Supplemented by an R package, including all data As the title suggests, this book is highly applied in nature, and is designed as a toolbox for the reader. It can be used in methods and data science courses, at both the undergraduate and graduate levels. It will be equally useful for a university student pursuing a PhD, political consultants, or a public official, all of whom need to transform their datasets into substantive and easily interpretable conclusions.

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