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HANDBOOK OF STATISTICAL ANALYSIS AND DATA MINING APPLICATIONS

Elsevier **Handbook of Statistical Analysis and Data Mining Applications, Second Edition, is a comprehensive professional reference book that guides business analysts, scientists, engineers and researchers, both academic and industrial, through all stages of data analysis, model building and implementation. The handbook helps users discern technical and business problems, understand the strengths and weaknesses of modern data mining algorithms and employ the right statistical methods for practical application. This book is an ideal reference for users who want to address massive and complex datasets with novel statistical approaches and be able to objectively evaluate analyses and solutions. It has clear, intuitive explanations of the principles and tools for solving problems using modern analytic techniques and discusses their application to real problems in ways accessible and beneficial to practitioners across several areas—from science and engineering, to medicine, academia and commerce. Includes input by practitioners for practitioners Includes tutorials in numerous fields of study that provide step-by-step instruction on how to use supplied tools to build models Contains practical advice from successful real-world implementations Brings together, in a single resource, all the information a beginner needs to understand the tools and issues in data mining to build successful data mining solutions Features clear, intuitive explanations of novel analytical tools and techniques, and their practical applications**

STATISTICAL AND MACHINE-LEARNING DATA MINING:

TECHNIQUES FOR BETTER PREDICTIVE MODELING AND ANALYSIS OF BIG DATA, THIRD EDITION

CRC Press **Interest in predictive analytics of big data has grown exponentially in the four years since the publication of Statistical and Machine-Learning Data Mining: Techniques for Better Predictive Modeling and Analysis of Big Data, Second Edition. In the third edition of this bestseller, the author has completely revised, reorganized, and repositioned the original chapters and produced 13 new chapters of creative and useful machine-learning data mining techniques. In sum, the 43 chapters of simple yet insightful quantitative techniques make this book unique in the field of data mining literature. What is new in the Third Edition: The current chapters have been completely rewritten. The core content has been extended with strategies and methods for problems drawn from the top predictive analytics conference and statistical modeling workshops. Adds thirteen new chapters including coverage of data science and its rise, market share estimation, share of wallet modeling without survey data, latent market segmentation, statistical regression modeling that deals with incomplete data, decile analysis assessment in terms of the predictive power of the data, and a user-friendly version of text mining, not requiring an advanced background in natural language processing (NLP). Includes SAS subroutines which can be easily converted to other languages. As in the previous edition, this book offers detailed background, discussion, and illustration of specific methods for solving the most commonly experienced problems in predictive modeling and analysis of big data. The author addresses each methodology and assigns its application to a specific type of problem. To better ground readers, the book provides an in-depth discussion of the basic methodologies of predictive modeling and analysis. While this type of overview has been attempted before, this approach offers a truly nitty-gritty, step-by-step method that both tyros and experts in the field can enjoy playing with.**

PRACTICAL TEXT MINING AND STATISTICAL ANALYSIS FOR NON-STRUCTURED TEXT DATA APPLICATIONS

Academic Press **The world contains an unimaginably vast amount of digital information which is getting ever vaster ever more rapidly. This makes it possible to do many things that previously could not be done: spot business trends, prevent diseases, combat crime and so on. Managed well, the textual data can be used to unlock new sources of economic value, provide fresh insights into science and hold governments to account. As the Internet expands and our natural capacity to process the unstructured text that it contains diminishes, the value of text mining for information retrieval and search will increase dramatically. This comprehensive professional reference brings together all the information, tools and methods a professional will need to efficiently use text mining applications and statistical analysis. The Handbook of Practical Text Mining and Statistical Analysis for Non-structured Text Data Applications presents a comprehensive how- to reference that shows the user how to conduct text mining and statistically analyze results. In addition to providing an in-depth examination of core text mining and link detection tools, methods and operations, the book examines advanced preprocessing techniques, knowledge representation considerations, and visualization approaches. Finally, the book explores current real-world, mission-critical applications of text mining and link detection using real world example tutorials in such varied fields as corporate, finance, business intelligence, genomics research, and counterterrorism activities. -Extensive case studies, most in a tutorial format, allow the reader to 'click through' the example using a software program, thus learning to conduct text mining analyses in the most rapid manner of learning possible -Numerous examples, tutorials, power points and datasets available via companion website on Elsevierdirect.com -Glossary of text mining terms provided in the appendix**

STATISTICAL DATA ANALYTICS

FOUNDATIONS FOR DATA MINING, INFORMATICS, AND KNOWLEDGE DISCOVERY, SOLUTIONS MANUAL

John Wiley & Sons **Solutions Manual to accompany Statistical Data Analytics: Foundations for Data Mining, Informatics, and Knowledge Discovery A comprehensive introduction to statistical methods for data mining and knowledge discovery. Extensive solutions using actual data (with sample R programming code) are provided, illustrating diverse informatic sources in genomics, biomedicine, ecological remote sensing, astronomy, socioeconomics, marketing, advertising and finance, among many others.**

DATA MINING FOR BUSINESS ANALYTICS

CONCEPTS, TECHNIQUES, AND APPLICATIONS WITH XLMINER

John Wiley & Sons **Data Mining for Business Analytics: Concepts, Techniques, and Applications in XLMiner®, Third Edition presents an applied approach to data mining and predictive analytics with clear exposition, hands-on exercises, and real-life case studies. Readers will work with all of the standard data mining methods using the Microsoft® Office Excel® add-in XLMiner® to develop predictive models and learn how to obtain business value from Big Data. Featuring updated topical coverage on text mining, social network analysis, collaborative filtering, ensemble methods, uplift modeling and more, the Third Edition also includes: Real-world examples to build a theoretical and practical understanding of key data mining methods End-of-chapter exercises that help readers better understand the presented material Data-rich case studies to illustrate various applications of data mining techniques Completely new chapters on social network analysis and text mining A companion site with additional data sets, instructors material that include solutions to exercises and case studies, and Microsoft PowerPoint® slides https://www.dataminingbook.com Free 140-day license to use XLMiner for Education software Data Mining for Business Analytics: Concepts, Techniques, and Applications in XLMiner®, Third Edition is an ideal textbook for upper-undergraduate and graduate-level courses as well as professional programs on data mining, predictive modeling, and Big Data analytics. The new edition is also a unique reference for analysts, researchers, and practitioners working with predictive analytics in the fields of business, finance, marketing, computer science, and information technology. Praise for the Second Edition "...full of vivid and thought-provoking anecdotes... needs to be read by anyone with a serious interest in research and marketing."– Research Magazine "Shmueli et al. have done a wonderful job in presenting the field of data mining - a welcome addition to the literature." – ComputingReviews.com "Excellent choice for business analysts...The book is a perfect fit for its intended audience." – Keith McCormick, Consultant and Author of SPSS Statistics For Dummies, Third Edition and SPSS Statistics for Data Analysis and Visualization Galit Shmueli, PhD, is Distinguished Professor at National Tsing Hua University's Institute of Service Science. She**

has designed and instructed data mining courses since 2004 at University of Maryland, Statistics.com, The Indian School of Business, and National Tsing Hua University, Taiwan. Professor Shmueli is known for her research and teaching in business analytics, with a focus on statistical and data mining methods in information systems and healthcare. She has authored over 70 journal articles, books, textbooks and book chapters. Peter C. Bruce is President and Founder of the Institute for Statistics Education at www.statistics.com. He has written multiple journal articles and is the developer of Resampling Stats software. He is the author of Introductory Statistics and Analytics: A Resampling Perspective, also published by Wiley. Nitin R. Patel, PhD, is Chairman and cofounder of Cytel, Inc., based in Cambridge, Massachusetts. A Fellow of the American Statistical Association, Dr. Patel has also served as a Visiting Professor at the Massachusetts Institute of Technology and at Harvard University. He is a Fellow of the Computer Society of India and was a professor at the Indian Institute of Management, Ahmedabad for 15 years.

STATISTICAL DATA MINING AND KNOWLEDGE DISCOVERY

CRC Press Massive data sets pose a great challenge to many cross-disciplinary fields, including statistics. The high dimensionality and different data types and structures have now outstripped the capabilities of traditional statistical, graphical, and data visualization tools. Extracting useful information from such large data sets calls for novel approache

DATA ANALYSIS IN THE TWENTY-FIRST CENTURY

The 21st Century is characterized by complex multidisciplinary problems accompanied by massive datasets. 'We are drowning in data, but starving for knowledge', as the volumes of many commercial, industrial and scientific datasets have exceeded the terabyte range and are approaching petabytes and beyond. Statistical methodology has long been employed to find useful and usable information in data. More recently, data mining has harnessed the power of computer technology to find useful and usable patterns in such massive datasets. Although several data mining journals have joined the established statistical journals, no single journal provides an integrated treatment of statistical analysis methodology and data mining technology, particularly when applied to the solution of practical problems. This absence and the needs expressed above motivated the inauguration of John Wiley's new Journal on Statistical Analysis and Data Mining. The goals of this interdisciplinary journal are to encourage collaborations across disciplines, communication of data mining and statistical techniques to both novices and experts involved in the analysis of data from practical problems, and a principled and productive evaluation of analyses and solutions. The journal specifically encourages submission of works that have statistical rigor in the analysis of data, incorporate the most appropriate algorithms from data mining, and address the needs of applications. Applying data mining algorithms to practical problems is not sufficient, because we need to ensure that the results have a sound statistical basis, lest any decision based on these results lead to a catastrophe. Even data mining algorithms founded on sound statistical analysis are not sufficient, if they cannot solve a practical problem. Finally, employing a statistical analysis on a practical problem is not sufficient, unless it scales up to massive datasets. Statistical analysis and data mining are actually two sides of the sword that is sorely needed to conquer data overload in practical problems.

STATISTICAL DATA ANALYTICS

FOUNDATIONS FOR DATA MINING, INFORMATICS, AND KNOWLEDGE DISCOVERY

John Wiley & Sons Statistical Data Analytics Statistical Data Analytics Foundations for Data Mining, Informatics, and Knowledge Discovery A comprehensive introduction to statistical methods for data mining and knowledge discovery Applications of data mining and 'big data' increasingly take center stage in our modern, knowledge-driven society, supported by advances in computing power, automated data acquisition, social media development and interactive, linkable internet software. This book presents a coherent, technical introduction to modern statistical learning and analytics, starting from the core foundations of statistics and probability. It includes an overview of probability and statistical distributions, basics of data manipulation and visualization, and the central components of standard statistical inferences. The majority of the text extends beyond these introductory topics, however, to supervised learning in linear regression, generalized linear models, and classification analytics. Finally, unsupervised learning via dimension reduction, cluster analysis, and market basket analysis are introduced. Extensive examples using actual data (with sample R programming code) are provided, illustrating diverse informatic sources in genomics, biomedicine, ecological remote sensing, astronomy, socioeconomics, marketing, advertising and finance, among many others. Statistical Data Analytics: Focuses on methods critically used in data mining and statistical informatics. Coherently describes the methods at an introductory level, with extensions to selected intermediate and advanced techniques. Provides informative, technical details for the highlighted methods. Employs the open-source R language as the computational vehicle – along with its burgeoning collection of online packages – to illustrate many of the analyses contained in the book. Concludes each chapter with a range of interesting and challenging homework exercises using actual data from a variety of informatic application areas. This book will appeal as a classroom or training text to intermediate and advanced undergraduates, and to beginning graduate students, with sufficient background in calculus and matrix algebra. It will also serve as a source-book on the foundations of statistical informatics and data analytics to practitioners who regularly apply statistical learning to their modern data.

DATA MINING AND ANALYSIS

FUNDAMENTAL CONCEPTS AND ALGORITHMS

Cambridge University Press A comprehensive overview of data mining from an algorithmic perspective, integrating related concepts from machine learning and statistics.

SYMBOLIC DATA ANALYSIS

CONCEPTUAL STATISTICS AND DATA MINING

John Wiley & Sons With the advent of computers, very large datasets have become routine. Standard statistical methods don't have the power or flexibility to analyse these efficiently, and extract the required knowledge. An alternative approach is to summarize a large dataset in such a way that the resulting summary dataset is of a manageable size and yet retains as much of the knowledge in the original dataset as possible. One consequence of this is that the data may no longer be formatted as single values, but be represented by lists, intervals, distributions, etc. The summarized data have their own internal structure, which must be taken into account in any analysis. This text presents a unified account of symbolic data, how they arise, and how they are structured. The reader is introduced to symbolic analytic methods described in the consistent statistical framework required to carry out such a summary and subsequent analysis. Presents a detailed overview of the methods and applications of symbolic data analysis. Includes numerous real examples, taken from a variety of application areas, ranging from health and social sciences, to economics and computing. Features exercises at the end of each chapter, enabling the reader to develop their understanding of the theory. Provides a supplementary website featuring links to download the SODAS software developed exclusively for symbolic data analysis, data sets, and further material. Primarily aimed at statisticians and data analysts, Symbolic Data Analysis is also ideal for scientists working on problems involving large volumes of data from a range of disciplines, including computer science, health and the social sciences. There is also much of use to graduate students of statistical data analysis courses.

MAKING SENSE OF DATA

A PRACTICAL GUIDE TO EXPLORATORY DATA ANALYSIS AND DATA MINING

John Wiley & Sons

SURVEY DATA COLLECTION AND INTEGRATION

Springer Science & Business Media Statistical surveys represent an important source of scientific knowledge and a valid decision support tool in many fields, from social studies to economics, market research, health studies, and others. Scientists have tackled most of the methodological issues concerning surveys and the scientific literature offers excellent proposals for planning and conducting surveys. Nevertheless, surveys often require the achievement of aims that either deviate from the methodology or do not have a specific solution at all. This book focuses on survey theory and applications, providing insight and innovative solutions to face problems in data collection and integration, complex sample design, opinion questionnaire design, and statistical estimation. Formal rigour and

simple language, together with real-life examples, will make the book suitable to both practitioners involved in applied research and to academics interested in scientific developments in the survey field.

REAL-WORLD DATA MINING

APPLIED BUSINESS ANALYTICS AND DECISION MAKING

Pearson Education **Includes bibliographical references and index.**

OPEN SOURCE SOFTWARE FOR STATISTICAL ANALYSIS OF BIG DATA: EMERGING RESEARCH AND OPPORTUNITIES

EMERGING RESEARCH AND OPPORTUNITIES

IGI Global **With the development of computing technologies in today's modernized world, software packages have become easily accessible. Open source software, specifically, is a popular method for solving certain issues in the field of computer science. One key challenge is analyzing big data due to the high amounts that organizations are processing. Researchers and professionals need research on the foundations of open source software programs and how they can successfully analyze statistical data. Open Source Software for Statistical Analysis of Big Data: Emerging Research and Opportunities provides emerging research exploring the theoretical and practical aspects of cost-free software possibilities for applications within data analysis and statistics with a specific focus on R and Python. Featuring coverage on a broad range of topics such as cluster analysis, time series forecasting, and machine learning, this book is ideally designed for researchers, developers, practitioners, engineers, academicians, scholars, and students who want to more fully understand in a brief and concise format the realm and technologies of open source software for big data and how it has been used to solve large-scale research problems in a multitude of disciplines.**

DATA MINING AND PREDICTIVE ANALYTICS

John Wiley & Sons **Learn methods of data analysis and their application to real-world data sets This updated second edition serves as an introduction to data mining methods and models, including association rules, clustering, neural networks, logistic regression, and multivariate analysis. The authors apply a unified "white box" approach to data mining methods and models. This approach is designed to walk readers through the operations and nuances of the various methods, using small data sets, so readers can gain an insight into the inner workings of the method under review. Chapters provide readers with hands-on analysis problems, representing an opportunity for readers to apply their newly-acquired data mining expertise to solving real problems using large, real-world data sets. Data Mining and Predictive Analytics: Offers comprehensive coverage of association rules, clustering, neural networks, logistic regression, multivariate analysis, and R statistical programming language Features over 750 chapter exercises, allowing readers to assess their understanding of the new material Provides a detailed case study that brings together the lessons learned in the book Includes access to the companion website, www.dataminingconsultant, with exclusive password-protected instructor content Data Mining and Predictive Analytics will appeal to computer science and statistic students, as well as students in MBA programs, and chief executives.**

STATISTICAL DATA MINING USING SAS APPLICATIONS

CRC Press **Statistical Data Mining Using SAS Applications, Second Edition describes statistical data mining concepts and demonstrates the features of user-friendly data mining SAS tools. Integrating the statistical and graphical analysis tools available in SAS systems, the book provides complete statistical data mining solutions without writing SAS program co**

STATISTICS FOR MINING ENGINEERING

CRC Press **Many areas of mining engineering gather and use statistical information, provided by observing the actual operation of equipment, their systems, the development of mining works, surface subsidence that accompanies underground mining, displacement of rocks surrounding surface pits and underground drives and longwalls, amongst others. In addition, th**

DISCOVERING KNOWLEDGE IN DATA

AN INTRODUCTION TO DATA MINING

John Wiley & Sons **Learn Data Mining by doing data mining Data mining can be revolutionary-but only when it's done right. The powerful black box data mining software now available can produce disastrously misleading results unless applied by a skilled and knowledgeable analyst. Discovering Knowledge in Data: An Introduction to Data Mining provides both the practical experience and the theoretical insight needed to reveal valuable information hidden in large data sets. Employing a "white box" methodology and with real-world case studies, this step-by-step guide walks readers through the various algorithms and statistical structures that underlie the software and presents examples of their operation on actual large data sets. Principal topics include: * Data preprocessing and classification * Exploratory analysis * Decision trees * Neural and Kohonen networks * Hierarchical and k-means clustering * Association rules * Model evaluation techniques Complete with scores of screenshots and diagrams to encourage graphical learning, Discovering Knowledge in Data: An Introduction to Data Mining gives students in Business, Computer Science, and Statistics as well as professionals in the field the power to turn any data warehouse into actionable knowledge. An Instructor's Manual presenting detailed solutions to all the problems in the book is available online.**

MAKING SENSE OF DATA I

A PRACTICAL GUIDE TO EXPLORATORY DATA ANALYSIS AND DATA MINING

John Wiley & Sons **Praise for the First Edition "...a well-written book on data analysis and data mining that provides an excellent foundation..." —CHOICE "This is a must-read book for learning practical statistics and data analysis..." —Computing Reviews.com A proven go-to guide for data analysis, Making Sense of Data I: A Practical Guide to Exploratory Data Analysis and Data Mining, Second Edition focuses on basic data analysis approaches that are necessary to make timely and accurate decisions in a diverse range of projects. Based on the authors' practical experience in implementing data analysis and data mining, the new edition provides clear explanations that guide readers from almost every field of study. In order to facilitate the needed steps when handling a data analysis or data mining project, a step-by-step approach aids professionals in carefully analyzing data and implementing results, leading to the development of smarter business decisions. The tools to summarize and interpret data in order to master data analysis are integrated throughout, and the Second Edition also features: Updated exercises for both manual and computer-aided implementation with accompanying worked examples New appendices with coverage on the freely available TraceisTM software, including tutorials using data from a variety of disciplines such as the social sciences, engineering, and finance New topical coverage on multiple linear regression and logistic regression to provide a range of widely used and transparent approaches Additional real-world examples of data preparation to establish a practical background for making decisions from data Making Sense of Data I: A Practical Guide to Exploratory Data Analysis and Data Mining, Second Edition is an excellent reference for researchers and professionals who need to achieve effective decision making from data. The Second Edition is also an ideal textbook for undergraduate and graduate-level courses in data analysis and data mining and is appropriate for cross-disciplinary courses found within computer science and engineering departments.**

DATA ANALYSIS

WHAT CAN BE LEARNED FROM THE PAST 50 YEARS

John Wiley & Sons This book explores the many provocative questions concerning the fundamentals of data analysis. It is based on the time-tested experience of one of the gurus of the subject matter. Why should one study data analysis? How should it be taught? What techniques work best, and for whom? How valid are the results? How much data should be tested? Which machine languages should be used, if used at all? Emphasis on apprenticeship (through hands-on case studies) and anecdotes (through real-life applications) are the tools that Peter J. Huber uses in this volume. Concern with specific statistical techniques is not of immediate value; rather, questions of strategy – when to use which technique – are employed. Central to the discussion is an understanding of the significance of massive (or robust) data sets, the implementation of languages, and the use of models. Each is sprinkled with an ample number of examples and case studies. Personal practices, various pitfalls, and existing controversies are presented when applicable. The book serves as an excellent philosophical and historical companion to any present-day text in data analysis, robust statistics, data mining, statistical learning, or computational statistics.

STATISTICS, DATA MINING, AND MACHINE LEARNING IN ASTRONOMY

A PRACTICAL PYTHON GUIDE FOR THE ANALYSIS OF SURVEY DATA

Princeton University Press As telescopes, detectors, and computers grow ever more powerful, the volume of data at the disposal of astronomers and astrophysicists will enter the petabyte domain, providing accurate measurements for billions of celestial objects. This book provides a comprehensive and accessible introduction to the cutting-edge statistical methods needed to efficiently analyze complex data sets from astronomical surveys such as the Panoramic Survey Telescope and Rapid Response System, the Dark Energy Survey, and the upcoming Large Synoptic Survey Telescope. It serves as a practical handbook for graduate students and advanced undergraduates in physics and astronomy, and as an indispensable reference for researchers. Statistics, Data Mining, and Machine Learning in Astronomy presents a wealth of practical analysis problems, evaluates techniques for solving them, and explains how to use various approaches for different types and sizes of data sets. For all applications described in the book, Python code and example data sets are provided. The supporting data sets have been carefully selected from contemporary astronomical surveys (for example, the Sloan Digital Sky Survey) and are easy to download and use. The accompanying Python code is publicly available, well documented, and follows uniform coding standards. Together, the data sets and code enable readers to reproduce all the figures and examples, evaluate the methods, and adapt them to their own fields of interest. Describes the most useful statistical and data-mining methods for extracting knowledge from huge and complex astronomical data sets Features real-world data sets from contemporary astronomical surveys Uses a freely available Python codebase throughout Ideal for students and working astronomers

DATA MINING AND BUSINESS ANALYTICS WITH R

John Wiley & Sons Collecting, analyzing, and extracting valuable information froma large amount of data requires easily accessible, robust,computational and analytical tools. Data Mining and BusinessAnalytics with R utilizes the open source software R for theanalysis, exploration, and simplification of large high-dimensionaldata sets. As a result, readers are provided with the neededguidance to model and interpret complicated data and become adeptat building powerful models for prediction and classification. Highlighting both underlying concepts and practicalcomputational skills, Data Mining and Business Analytics withR begins with coverage of standard linear regression and theimportance of parsimony in statistical modeling. The book includesimportant topics such as penalty-based variable selection (LASSO);logistic regression; regression and classification trees;clustering; principal components and partial least squares; and theanalysis of text and network data. In addition, the bookpresents: • A thorough discussion and extensive demonstration of thetheory behind the most useful data mining tools • Illustrations of how to use the outlined concepts inreal-world situations • Readily available additional data sets and related Rcode allowing readers to apply their own analyses to the discussedmaterials • Numerous exercises to help readers with computing skillsand deepen their understanding of the material Data Mining and Business Analytics with R is an excellentgraduate-level textbook for courses on data mining and businessanalytics. The book is also a valuable reference for practitionerswho collect and analyze data in the fields of finance, operationsmanagement, marketing, and the information sciences.

ADVANCED ANALYTICS IN MINING ENGINEERING

LEVERAGE ADVANCED ANALYTICS IN MINING INDUSTRY TO MAKE BETTER BUSINESS DECISIONS

Springer Nature In this book, Dr. Soofastaei and his colleagues reveal how all mining managers can effectively deploy advanced analytics in their day-to-day operations- one business decision at a time. Most mining companies have a massive amount of data at their disposal. However, they cannot use the stored data in any meaningful way. The powerful new business tool-advanced analytics enables many mining companies to aggressively leverage their data in key business decisions and processes with impressive results. From statistical analysis to machine learning and artificial intelligence, the authors show how many analytical tools can improve decisions about everything in the mine value chain, from exploration to marketing. Combining the science of advanced analytics with the mining industrial business solutions, introduce the "Advanced Analytics in Mining Engineering Book" as a practical road map and tools for unleashing the potential buried in your company's data. The book is aimed at providing mining executives, managers, and research and development teams with an understanding of the business value and applicability of different analytic approaches and helping data analytics leads by giving them a business framework in which to assess the value, cost, and risk of potential analytical solutions. In addition, the book will provide the next generation of miners – undergraduate and graduate IT and mining engineering students – with an understanding of data analytics applied to the mining industry. By providing a book with chapters structured in line with the mining value chain, we will provide a clear, enterprise-level view of where and how advanced data analytics can best be applied. This book highlights the potential to interconnect activities in the mining enterprise better. Furthermore, the book explores the opportunities for optimization and increased productivity offered by better interoperability along the mining value chain – in line with the emerging vision of creating a digital mine with much-enhanced capabilities for modeling, simulation, and the use of digital twins – in line with leading "digital" industries.

PRACTICAL PREDICTIVE ANALYTICS AND DECISIONING SYSTEMS FOR MEDICINE

INFORMATICS ACCURACY AND COST-EFFECTIVENESS FOR HEALTHCARE ADMINISTRATION AND DELIVERY INCLUDING MEDICAL RESEARCH

Academic Press With the advent of electronic medical records years ago and the increasing capabilities of computers, our healthcare systems are sitting on growing mountains of data. Not only does the data grow from patient volume but the type of data we store is also growing exponentially. Practical Predictive Analytics and Decisioning Systems for Medicine provides research tools to analyze these large amounts of data and addresses some of the most pressing issues and challenges where data integrity is compromised: patient safety, patient communication, and patient information. Through the use of predictive analytic models and applications, this book is an invaluable resource to predict more accurate outcomes to help improve quality care in the healthcare and medical industries in the most cost-efficient manner. Practical Predictive Analytics and Decisioning Systems for Medicine provides the basics of predictive analytics for those new to the area and focuses on general philosophy and activities in the healthcare and medical system. It explains why predictive models are important, and how they can be applied to the predictive analysis process in order to solve real industry problems. Researchers need this valuable resource to improve data analysis skills and make more accurate and cost-effective decisions. Includes models and applications of predictive analytics why they are important and how they can be used in healthcare and medical research Provides real world step-by-step tutorials to help beginners understand how the predictive analytic processes works and to successfully do the computations Demonstrates methods to help sort through data to make better observations and allow you to make better predictions

EVOLVING APPLICATION DOMAINS OF DATA WAREHOUSING AND MINING: TRENDS AND SOLUTIONS

TRENDS AND SOLUTIONS

IGI Global "This book provides insight into the latest findings concerning data warehousing, data mining, and their applications in everyday human activities"--Provided by publisher.

ESSENTIALS OF DATA SCIENCE AND ANALYTICS

STATISTICAL TOOLS, MACHINE LEARNING, AND R-STATISTICAL SOFTWARE OVERVIEW

Business Expert Press **Data science and analytics have emerged as the most desired fields in driving business decisions. Using the techniques and methods of data science, decision makers can uncover hidden patterns in their data, develop algorithms and models that help improve processes and make key business decisions. Data science is a data driven decision making approach that uses several different areas and disciplines with a purpose of extracting insights and knowledge from structured and unstructured data. The algorithms and models of data science along with machine learning and predictive modeling are widely used in solving business problems and predicting future outcomes. This book combines the key concepts of data science and analytics to help you gain a practical understanding of these fields. The four different sections of the book are divided into chapters that explain the core of data science. Given the booming interest in data science, this book is timely and informative.**

TEXT MINING AND ANALYSIS

PRACTICAL METHODS, EXAMPLES, AND CASE STUDIES USING SAS

SAS Institute **Big data: It's unstructured, it's coming at you fast, and there's lots of it. In fact, the majority of big data is text-oriented, thanks to the proliferation of online sources such as blogs, emails, and social media. However, having big data means little if you can't leverage it with analytics. Now you can explore the large volumes of unstructured text data that your organization has collected with Text Mining and Analysis: Practical Methods, Examples, and Case Studies Using SAS. This hands-on guide to text analytics using SAS provides detailed, step-by-step instructions and explanations on how to mine your text data for valuable insight. Through its comprehensive approach, you'll learn not just how to analyze your data, but how to collect, cleanse, organize, categorize, explore, and interpret it as well. Text Mining and Analysis also features an extensive set of case studies, so you can see examples of how the applications work with real-world data from a variety of industries. Text analytics enables you to gain insights about your customers' behaviors and sentiments. Leverage your organization's text data, and use those insights for making better business decisions with Text Mining and Analysis. This book is part of the SAS Press program.**

STATISTICAL ROUNDTABLES

INSIGHTS AND BEST PRACTICES

Quality Press **Quality Progress, the flagship journal of ASQ, has been publishing the column ⬚Statistics Roundtable⬚ since 1999. With over 130 contributions from leading authors in applied statistics, the column has been highly successful and widely read. This book collects 90 of the most interesting and useful articles on some key topics. The editors have constructed this book to be a resource for statisticians and practitioners alike ⬚ with short, accessible, practical advice in important core areas of statistics from world-renowned experts. This book is intended to be an informative read, with bite-sized columns, as well as a starting point for deeper exploration of key statistical areas. The book contains nine chapters with collections of articles on the following topics: Statistical engineering Data quality and measurement Data collection Key statistical tools Quality control Reliability Multiple response and meta-analysis Applications Communication and training Chapter introductions provide a quick overview of the material contained in the columns of that chapter, as well as complementary articles for that topic that appear elsewhere in the book. Also included at the end of the each chapter introduction is a short list of key references that can provide additional details or examples for material in the topic area.**

APPLIED DATA MINING

STATISTICAL METHODS FOR BUSINESS AND INDUSTRY

John Wiley & Sons **Data mining can be defined as the process of selection, explorationand modelling of large databases, in order to discover models andpatterns. The increasing availability of data in the currentinformation society has led to the need for valid tools for itsmodelling and analysis. Data mining and applied statistical methodsare the appropriate tools to extract such knowledge from data.Applications occur in many different fields, including statistics,computer science, machine learning, economics, marketing andfinance. This book is the first to describe applied data mining methodsin a consistent statistical framework, and then show how they canbe applied in practice. All the methods described are eithercomputational, or of a statistical modelling nature. Complexprobabilistic models and mathematical tools are not used, so thebook is accessible to a wide audience of students and industryprofessionals. The second half of the book consists of nine casestudies, taken from the author's own work in industry, thatdemonstrate how the methods described can be applied to realproblems. Provides a solid introduction to applied data mining methods ina consistent statistical framework Includes coverage of classical, multivariate and Bayesianstatistical methodology Includes many recent developments such as web mining,sequential Bayesian analysis and memory based reasoning Each statistical method described is illustrated with real lifeapplications Features a number of detailed case studies based on appliedprojects within industry Incorporates discussion on software used in data mining, withparticular emphasis on SAS Supported by a website featuring data sets, software andadditional material Includes an extensive bibliography and pointers to furtherreading within the text Author has many years experience teaching introductory andmultivariate statistics and data mining, and working on appliedprojects within industry A valuable resource for advanced undergraduate and graduatestudents of applied statistics, data mining, computer science andeconomics, as well as for professionals working in industry onprojects involving large volumes of data - such as in marketing orfinancial risk management.**

DATA MINING AND EXPLORATION

FROM TRADITIONAL STATISTICS TO MODERN DATA SCIENCE

CRC Press **This book introduces both conceptual and procedural aspects of cutting-edge data science methods, such as dynamic data visualization, artificial neural networks, ensemble methods, and text mining. There are at least two unique elements that can set the book apart from its rivals. First, most students in social sciences, engineering, and business took at least one class in introductory statistics before learning data science. However, usually these courses do not discuss the similarities and differences between traditional statistics and modern data science; as a result learners are disoriented by this seemingly drastic paradigm shift. In reaction, some traditionalists reject data science altogether while some beginning data analysts employ data mining tools as a "black box", without a comprehensive view of the foundational differences between traditional and modern methods (e.g., dichotomous thinking vs. pattern recognition, confirmation vs. exploration, single method vs. triangulation, single sample vs. cross-validation etc.). This book delineates the transition between classical methods and data science (e.g. from p value to Log Worth, from resampling to ensemble methods, from content analysis to text mining etc.). Second, this book aims to widen the learner's horizon by covering a plethora of software tools. When a technician has a hammer, every problem seems to be a nail. By the same token, many textbooks focus on a single software package only, and consequently the learner tends to fit the problem with the tool, but not the other way around. To rectify the situation, a competent analyst should be equipped with a tool set, rather than a single tool. For example, when the analyst works with crucial data in a highly regulated industry, such as pharmaceutical and banking, commercial software modules (e.g., SAS) are indispensable. For a mid-size and small company, open-source packages such as Python would come in handy. If the research goal is to create an executive summary quickly, the logical choice is rapid model comparison. If the analyst would like to explore the data by asking what-if questions, then dynamic graphing in JMP Pro is a better option. This book uses concrete examples to explain the pros and cons of various software applications.**

STATISTICAL METHODS FOR PRACTICE AND RESEARCH

A GUIDE TO DATA ANALYSIS USING SPSS

SAGE Publications India **There is a growing trend these days to use statistical methods to comprehend and explain various situations and phenomena in different disciplines. Managers, social scientists and practicing researchers are increasingly collecting information and applying scientific methods to analyze the data. The ability to use statistical methods and tools becomes a crucial skill for the success of such efforts. This book is designed to assist students, managers, academics and researchers in solving statistical problems using SPSS and to help them understand how they can apply various statistical tools for their own research problems. SPSS is a very powerful and user friendly computer package for data analyses. It can take data from most other file types and generate tables, charts, plots,**

and descriptive statistics, and conduct complex statistical analyses. After providing a brief overview of SPSS and basic statistical concepts, the book covers: - Descriptive statistics - t-tests, chi-square tests and ANOVA - Correlation analysis - Multiple and logistics regression - Factor analysis and testing scale reliability - Advanced data handling Illustrated with simple, practical problems, and screen shots, this book outlines the steps for solving statistical problems using SPSS. Although the illustrations are based on version 16.0 of SPSS, users of the earlier versions will find the book equally useful and relevant. Written in a reader-friendly, non-technical style, this book will serve as a companion volume to any statistics textbook.

BASIC STATISTICAL IDEAS FOR MANAGERS

South-Western Pub Accompanying CD-ROM contains ... "Palisade StatTools Excel Add-In; data sets in the formats Minitab, Excel, SAS, JMP, SPSS, and ASCII."--CD-ROM label.

CONTEMPORARY PERSPECTIVES IN DATA MINING, VOLUME 1

IAP The series, Contemporary Perspectives on Data Mining, is composed of blind refereed scholarly research methods and applications of data mining. This series will be targeted both at the academic community, as well as the business practitioner. Data mining seeks to discover knowledge from vast amounts of data with the use of statistical and mathematical techniques. The knowledge is extracted form this data by examining the patterns of the data, whether they be associations of groups or things, predictions, sequential relationships between time order events or natural groups. Data mining applications are seen in finance (banking, brokerage, insurance), marketing (customer relationships, retailing, logistics, travel), as well as in manufacturing, health care, fraud detection, home-land security, and law enforcement.

INTELLIGENT DATA ANALYSIS

AN INTRODUCTION

Springer This second and revised edition contains a detailed introduction to the key classes of intelligent data analysis methods. The twelve coherently written chapters by leading experts provide complete coverage of the core issues. The first half of the book is devoted to the discussion of classical statistical issues. The following chapters concentrate on machine learning and artificial intelligence, rule induction methods, neural networks, fuzzy logic, and stochastic search methods. The book concludes with a chapter on visualization and an advanced overview of IDA processes.

DATA WAREHOUSING AND MINING: CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS

CONCEPTS, METHODOLOGIES, TOOLS, AND APPLICATIONS

IGI Global In recent years, the science of managing and analyzing large datasets has emerged as a critical area of research. In the race to answer vital questions and make knowledgeable decisions, impressive amounts of data are now being generated at a rapid pace, increasing the opportunities and challenges associated with the ability to effectively analyze this data.

BIG DATA ANALYTICS

Elsevier While the term Big Data is open to varying interpretation, it is quite clear that the Volume, Velocity, and Variety (3Vs) of data have impacted every aspect of computational science and its applications. The volume of data is increasing at a phenomenal rate and a majority of it is unstructured. With big data, the volume is so large that processing it using traditional database and software techniques is difficult, if not impossible. The drivers are the ubiquitous sensors, devices, social networks and the all-pervasive web. Scientists are increasingly looking to derive insights from the massive quantity of data to create new knowledge. In common usage, Big Data has come to refer simply to the use of predictive analytics or other certain advanced methods to extract value from data, without any required magnitude thereon. Challenges include analysis, capture, curation, search, sharing, storage, transfer, visualization, and information privacy. While there are challenges, there are huge opportunities emerging in the fields of Machine Learning, Data Mining, Statistics, Human-Computer Interfaces and Distributed Systems to address ways to analyze and reason with this data. The edited volume focuses on the challenges and opportunities posed by "Big Data" in a variety of domains and how statistical techniques and innovative algorithms can help glean insights and accelerate discovery. Big data has the potential to help companies improve operations and make faster, more intelligent decisions. Review of big data research challenges from diverse areas of scientific endeavor Rich perspective on a range of data science issues from leading researchers Insight into the mathematical and statistical theory underlying the computational methods used to address big data analytics problems in a variety of domains

EXPLORATORY DATA MINING AND DATA CLEANING

John Wiley & Sons Written for practitioners of data mining, data cleaning anddatabase management. Presents a technical treatment of data quality includingprocess, metrics, tools and algorithms. Focuses on developing an evolving modeling strategy through aniterative data exploration loop and incorporation of domainknowledge. Addresses methods of detecting, quantifying and correcting dataquality issues that can have a significant impact on findings anddecisions, using commercially available tools as well as newalgorithmic approaches. Uses case studies to illustrate applications in real lifescenarios. Highlights new approaches and methodologies, such as theDataSphere space partitioning and summary based analysistechniques. Exploratory Data Mining and Data Cleaning will serve as animportant reference for serious data analysts who need to analyzelarge amounts of unfamiliar data, managers of operations databases,and students in undergraduate or graduate level courses dealingwith large scale data analys is and data mining.

MODELING ONLINE AUCTIONS

John Wiley & Sons Explore cutting-edge statistical methodologies for collecting, analyzing, and modeling online auction data Online auctions are an increasingly important marketplace, as the new mechanisms and formats underlying these auctions have enabled the capturing and recording of large amounts of bidding data that are used to make important business decisions. As a result, new statistical ideas and innovation are needed to understand bidders, sellers, and prices. Combining methodologies from the fields of statistics, data mining, information systems, and economics, Modeling Online Auctions introduces a new approach to identifying obstacles and asking new questions using online auction data. The authors draw upon their extensive experience to introduce the latest methods for extracting new knowledge from online auction data. Rather than approach the topic from the traditional game-theoretic perspective, the book treats the online auction mechanism as a data generator, outlining methods to collect, explore, model, and forecast data. Topics covered include: Data collection methods for online auctions and related issues that arise in drawing data samples from a Web site Models for bidder and bid arrivals, treating the different approaches for exploring bidder-seller networks Data exploration, such as integration of time series and cross-sectional information; curve clustering; semi-continuous data structures; and data hierarchies The use of functional regression as well as functional differential equation models, spatial models, and stochastic models for capturing relationships in auction data Specialized methods and models for forecasting auction prices and their applications in automated bidding decision rule systems Throughout the book, R and MATLAB software are used for illustrating the discussed techniques. In addition, a related Web site features many of the book's datasets and R and MATLAB code that allow readers to replicate the analyses and learn new methods to apply to their own research. Modeling Online Auctions is a valuable book for graduate-level courses on data mining and applied regression analysis. It is also a one-of-a-kind reference for researchers in the fields of statistics, information systems, business, and marketing who work with electronic data and are looking for new approaches for understanding online auctions and processes. Visit this book's companion website by clicking here

NEXT GENERATION OF DATA MINING

CRC Press 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.

THEORETIC FOUNDATION OF PREDICTIVE DATA ANALYTICS

Morgan Kaufmann Theoretic Foundation of Predictive Data Analytics presents the latest in data science, an area that is penetrating into virtually every discipline of science, engineering, and medicine, and is a fast evolving field. Practitioners, researchers, and graduate students often have difficulty in understanding the foundation of data science. In order to have a deep understanding of data science, a strong understanding of statistical analysis and machine learning is a must. This book introduces the commonly used statistical principles behind many machine learning and data mining algorithms, the connections of those principles, and the connections of those principles to commonly utilized data analytic algorithms. Presents an ideal guide for readers that want to go deep into the basics of statistics and probability and how it applies to data science Illustrates the connection of widely used data analytics methods and statistical and computational principles Presents applied examples from several disciplines including, but not limited to, computer science, engineering and medicine Discusses extensive experimental results using real application datasets to demonstrate the performance of statistical and machine learning techniques