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STATS

DATA AND MODELS

Pearson **NOTE: You are purchasing a standalone product; MyStatLab does not come packaged with this content. If you would like to purchase both the physical text and MyStatLab search for: 0133956490 / 9780133956498 Stats: Data and Models Plus NEW MyStatLab with Pearson eText -- Access Card Package Package consists of: 0321847997 / 9780321847997 My StatLab Glue-in Access Card 032184839X / 9780321848390 MyStatLab Inside Sticker for Glue-In Packages 0321986490 / 9780321986498 Stats: Data and Models MyStatLab should only be purchased when required by an instructor. For one-or-two semester introductory statistics courses. Richard De Veaux, Paul Velleman, and David Bock wrote Stats: Data and Models with the goal that students and instructors have as much fun reading it as they did writing it. Maintaining a conversational, humorous, and informal writing style, this new edition engages students from the first page. The authors focus on statistical thinking throughout the text and rely on technology for calculations. As a result, students can focus on developing their conceptual understanding. Innovative Think/Show/Tell examples give students a problem-solving framework and, more importantly, a way to think through any statistics problem and present their results. The Fourth Edition is updated with instructor podcasts, video lectures, and new examples to keep material fresh, current, and relevant to today's students.**

STATS

DATA AND MODELS, THIRD CANADIAN EDITION

Unparalleled in its readability and ease of comprehension, *Stats: Data and Models, Third Canadian Edition*, focuses on statistical thinking and data analysis. Written in an approachable style without sacrificing rigor, this text incorporates compelling examples derived from the authors' wealth of teaching experience and encourages students to learn how to reason with data. *Stats: Data and Models* promotes conceptual understanding for applied statistics without overwhelming the reader with tedious calculations and complex mathematics. This Third Canadian Edition has been meticulously updated to include the most relevant and engaging Canadian examples and data. **KEY TOPICS:** Stats Starts Here; Displaying and Describing Categorical Data; Displaying and Summarizing Quantitative Data; Understanding and Comparing Distributions; The Standard Deviation as a Ruler and the Normal Model; Review: Exploring and Understanding Data; Scatterplots, Association, and Correlation; Linear Regression; Regression Wisdom; Review Exploring Relationships Between Variables; Sample Surveys; Experiments and Observational Studies; Review: Gathering Data; From Randomness to Probability; Probability Rules!; Random Variables; Review: Randomness and Probability; Sampling Distribution Models; Confidence Intervals for Proportions; Testing Hypotheses About Proportions; More About Tests; Inferences About Means; Review: From the Data at Hand to the World at Large; Comparing Means; Paired Samples and Blocks; Comparing Two Proportions; Comparing Counts; Inferences for Regression; Review: Assessing Associations Between Variables; Analysis of Variance; Multifactor Analysis of Variance; Multiple Regression; Multiple Regression Wisdom; Review Inference When Variables Are Related; Nonparametric Tests; The Bootstrap (online only) **MARKET:** Appropriate for Introductory Statistics-Algebra-Based Courses.

STATS: DATA AND MODELS, GLOBAL EDITION

For courses in Introductory Statistics. Encourages statistical thinking using technology, innovative methods, and a sense of humour. Inspired by the 2016 GAISE Report revision, *Stats: Data and Models, 5th Edition* by De Veaux, Velleman, and Bock uses innovative strategies to help students think critically about data, while maintaining the book's core concepts, coverage, and most importantly, readability. The authors make it easier for instructors to teach and for students to understand more complicated statistical concepts later in the course (such as the Central Limit Theorem). In addition, students get more exposure to large data sets and multivariate thinking, which better prepares

them to be critical consumers of statistics in the 21st century. The 5th Edition's approach to teaching Stats: Data and Models is revolutionary, yet it retains the book's lively tone and hallmark pedagogical features such as its Think/Show/Tell Step-by-Step Examples. Samples Download the detailed table of contents Preview sample pages from Stats: Data and Models, Global Edition

STATS: DATA AND MODELS, EBOOK, GLOBAL EDITION

Pearson Higher Ed Stats: Data and Models, eBook, Global Edition

STATS: PEARSON NEW INTERNATIONAL EDITION

DATA AND MODELS

Pearson Higher Ed Stats: Data and Models, Third Edition, will intrigue and challenge students by encouraging them to think statistically and by emphasizing how statistics helps us understand the world. Praised by students and instructors alike for its readability and ease of comprehension, this text focuses on statistical thinking and data analysis. The authors draw from their wealth of consulting experience to craft compelling examples, which encourage students to learn how to reason with data. This book is organized into short chapters that concentrate on one topic at a time, offering instructors maximum flexibility in planning their courses. The book is appropriate for a one-or-two semester introductory statistics course and includes advanced topics, such as Analysis of Variance (ANOVA), Multiple Regression, and Nonparametrics. ζ Datasets and other resources (where applicable) for this book are available at www.pearsonhighered.com/dvb

MIXED EFFECTS MODELS FOR COMPLEX DATA

CRC Press Although standard mixed effects models are useful in a range of studies, other approaches must often be used in correlation with them when studying complex or incomplete data. Mixed Effects Models for Complex Data discusses commonly used mixed effects models and presents appropriate approaches to address dropouts, missing data, measurement errors, censoring, and outliers. For each class of mixed effects model, the author reviews the corresponding class of regression model for cross-sectional data. An overview of general models and methods, along with motivating examples After presenting real data examples and outlining general approaches to the analysis of

longitudinal/clustered data and incomplete data, the book introduces linear mixed effects (LME) models, generalized linear mixed models (GLMMs), nonlinear mixed effects (NLME) models, and semiparametric and nonparametric mixed effects models. It also includes general approaches for the analysis of complex data with missing values, measurement errors, censoring, and outliers. Self-contained coverage of specific topics Subsequent chapters delve more deeply into missing data problems, covariate measurement errors, and censored responses in mixed effects models. Focusing on incomplete data, the book also covers survival and frailty models, joint models of survival and longitudinal data, robust methods for mixed effects models, marginal generalized estimating equation (GEE) models for longitudinal or clustered data, and Bayesian methods for mixed effects models. Background material In the appendix, the author provides background information, such as likelihood theory, the Gibbs sampler, rejection and importance sampling methods, numerical integration methods, optimization methods, bootstrap, and matrix algebra. Failure to properly address missing data, measurement errors, and other issues in statistical analyses can lead to severely biased or misleading results. This book explores the biases that arise when naïve methods are used and shows which approaches should be used to achieve accurate results in longitudinal data analysis.

STATISTICS, DATA ANALYSIS, AND DECISION MODELING

Prentice Hall **A pragmatic approach to statistics, data analysis and decision modeling. Statistics, Data Analysis & Decision Modeling** focuses on the practical understanding of its topics, allowing readers to develop conceptual insight on fundamental techniques and theories. Evans' dedication to present material in a simple and straightforward fashion is ideal for comprehension.

APPLIED STATISTICAL MODELING AND DATA ANALYTICS

A PRACTICAL GUIDE FOR THE PETROLEUM GEOSCIENCES

Elsevier **Applied Statistical Modeling and Data Analytics: A Practical Guide for the Petroleum Geosciences** provides a practical guide to many of the classical and modern statistical techniques that have become established for oil and gas professionals in recent years. It serves as a "how to" reference volume for the practicing petroleum engineer or geoscientist interested in applying statistical methods in formation evaluation, reservoir characterization, reservoir modeling and management, and uncertainty quantification. Beginning with a foundational discussion of exploratory data analysis, probability distributions and linear regression modeling, the book focuses on fundamentals and practical

examples of such key topics as multivariate analysis, uncertainty quantification, data-driven modeling, and experimental design and response surface analysis. Data sets from the petroleum geosciences are extensively used to demonstrate the applicability of these techniques. The book will also be useful for professionals dealing with subsurface flow problems in hydrogeology, geologic carbon sequestration, and nuclear waste disposal. Authored by internationally renowned experts in developing and applying statistical methods for oil & gas and other subsurface problem domains Written by practitioners for practitioners Presents an easy to follow narrative which progresses from simple concepts to more challenging ones Includes online resources with software applications and practical examples for the most relevant and popular statistical methods, using data sets from the petroleum geosciences Addresses the theory and practice of statistical modeling and data analytics from the perspective of petroleum geoscience applications

AN INTRODUCTION TO STATISTICAL LEARNING

WITH APPLICATIONS IN R

Springer Science & Business Media **An Introduction to Statistical Learning** provides an accessible overview of the field of statistical learning, an essential toolset for making sense of the vast and complex data sets that have emerged in fields ranging from biology to finance to marketing to astrophysics in the past twenty years. This book presents some of the most important modeling and prediction techniques, along with relevant applications. Topics include linear regression, classification, resampling methods, shrinkage approaches, tree-based methods, support vector machines, clustering, and more. Color graphics and real-world examples are used to illustrate the methods presented. Since the goal of this textbook is to facilitate the use of these statistical learning techniques by practitioners in science, industry, and other fields, each chapter contains a tutorial on implementing the analyses and methods presented in R, an extremely popular open source statistical software platform. Two of the authors co-wrote *The Elements of Statistical Learning* (Hastie, Tibshirani and Friedman, 2nd edition 2009), a popular reference book for statistics and machine learning researchers. *An Introduction to Statistical Learning* covers many of the same topics, but at a level accessible to a much broader audience. This book is targeted at statisticians and non-statisticians alike who wish to use cutting-edge statistical learning techniques to analyze their data. The text assumes only a previous course in linear regression and no knowledge of matrix algebra.

MATHEMATICAL STATISTICS AND DATA ANALYSIS

Cengage Learning This is the first text in a generation to re-examine the purpose of the mathematical statistics course. The book's approach interweaves traditional topics with data analysis and reflects the use of the computer with close ties to the practice of statistics. The author stresses analysis of data, examines real problems with real data, and motivates the theory. The book's descriptive statistics, graphical displays, and realistic applications stand in strong contrast to traditional texts that are set in abstract settings. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

PRACTICAL STATISTICS FOR DATA SCIENTISTS

50 ESSENTIAL CONCEPTS

"O'Reilly Media, Inc." Statistical methods are a key part of data science, yet very few data scientists have any formal statistics training. Courses and books on basic statistics rarely cover the topic from a data science perspective. This practical guide explains how to apply various statistical methods to data science, tells you how to avoid their misuse, and gives you advice on what's important and what's not. Many data science resources incorporate statistical methods but lack a deeper statistical perspective. If you're familiar with the R programming language, and have some exposure to statistics, this quick reference bridges the gap in an accessible, readable format. With this book, you'll learn: Why exploratory data analysis is a key preliminary step in data science How random sampling can reduce bias and yield a higher quality dataset, even with big data How the principles of experimental design yield definitive answers to questions How to use regression to estimate outcomes and detect anomalies Key classification techniques for predicting which categories a record belongs to Statistical machine learning methods that "learn" from data Unsupervised learning methods for extracting meaning from unlabeled data

R FOR DATA SCIENCE

IMPORT, TIDY, TRANSFORM, VISUALIZE, AND MODEL DATA

"O'Reilly Media, Inc." Learn how to use R to turn raw data into insight, knowledge, and understanding. This book introduces you to R, RStudio, and the tidyverse, a collection of R packages designed to work together to make data

science fast, fluent, and fun. Suitable for readers with no previous programming experience, R for Data Science is designed to get you doing data science as quickly as possible. Authors Hadley Wickham and Garrett Grolemund guide you through the steps of importing, wrangling, exploring, and modeling your data and communicating the results. You'll get a complete, big-picture understanding of the data science cycle, along with basic tools you need to manage the details. Each section of the book is paired with exercises to help you practice what you've learned along the way. You'll learn how to: **Wrangle**—transform your datasets into a form convenient for analysis **Program**—learn powerful R tools for solving data problems with greater clarity and ease **Explore**—examine your data, generate hypotheses, and quickly test them **Model**—provide a low-dimensional summary that captures true "signals" in your dataset **Communicate**—learn R Markdown for integrating prose, code, and results

APPLIED LINEAR STATISTICAL MODELS

McGraw-Hill Education **Applied Linear Statistical Models 5e** is the long established leading authoritative text and reference on statistical modeling. For students in most any discipline where statistical analysis or interpretation is used, **ALSM** serves as the standard work. The text includes brief introductory and review material, and then proceeds through regression and modeling for the first half, and through ANOVA and Experimental Design in the second half. All topics are presented in a precise and clear style supported with solved examples, numbered formulae, graphic illustrations, and "Notes" to provide depth and statistical accuracy and precision. Applications used within the text and the hallmark problems, exercises, and projects are drawn from virtually all disciplines and fields providing motivation for students in virtually any college. The Fifth edition provides an increased use of computing and graphical analysis throughout, without sacrificing concepts or rigor. In general, the 5e uses larger data sets in examples and exercises, and where methods can be automated within software without loss of understanding, it is so done.

BAYESIAN DATA ANALYSIS, THIRD EDITION

CRC Press **Now in its third edition**, this classic book is widely considered the leading text on Bayesian methods, lauded for its accessible, practical approach to analyzing data and solving research problems. **Bayesian Data Analysis, Third Edition** continues to take an applied approach to analysis using up-to-date Bayesian methods. The authors—all leaders in the statistics community—introduce basic concepts from a data-analytic perspective before presenting advanced methods. Throughout the text, numerous worked examples drawn from real applications and research emphasize the

use of Bayesian inference in practice. New to the Third Edition Four new chapters on nonparametric modeling Coverage of weakly informative priors and boundary-avoiding priors Updated discussion of cross-validation and predictive information criteria Improved convergence monitoring and effective sample size calculations for iterative simulation Presentations of Hamiltonian Monte Carlo, variational Bayes, and expectation propagation New and revised software code The book can be used in three different ways. For undergraduate students, it introduces Bayesian inference starting from first principles. For graduate students, the text presents effective current approaches to Bayesian modeling and computation in statistics and related fields. For researchers, it provides an assortment of Bayesian methods in applied statistics. Additional materials, including data sets used in the examples, solutions to selected exercises, and software instructions, are available on the book's web page.

STATISTICS DONE WRONG

THE WOEFULLY COMPLETE GUIDE

No Starch Press **Scientific progress depends on good research, and good research needs good statistics. But statistical analysis is tricky to get right, even for the best and brightest of us. You'd be surprised how many scientists are doing it wrong. Statistics Done Wrong is a pithy, essential guide to statistical blunders in modern science that will show you how to keep your research blunder-free. You'll examine embarrassing errors and omissions in recent research, learn about the misconceptions and scientific politics that allow these mistakes to happen, and begin your quest to reform the way you and your peers do statistics. You'll find advice on: -Asking the right question, designing the right experiment, choosing the right statistical analysis, and sticking to the plan -How to think about p values, significance, insignificance, confidence intervals, and regression -Choosing the right sample size and avoiding false positives -Reporting your analysis and publishing your data and source code -Procedures to follow, precautions to take, and analytical software that can help Scientists: Read this concise, powerful guide to help you produce statistically sound research. Statisticians: Give this book to everyone you know. The first step toward statistics done right is Statistics Done Wrong.**

LINEAR MODELS IN STATISTICS

John Wiley & Sons **The essential introduction to the theory and application of linear models—now in a valuable new edition Since most advanced statistical tools are generalizations of the linear model, it is necessary to first master the**

linear model in order to move forward to more advanced concepts. The linear model remains the main tool of the applied statistician and is central to the training of any statistician regardless of whether the focus is applied or theoretical. This completely revised and updated new edition successfully develops the basic theory of linear models for regression, analysis of variance, analysis of covariance, and linear mixed models. Recent advances in the methodology related to linear mixed models, generalized linear models, and the Bayesian linear model are also addressed. *Linear Models in Statistics, Second Edition* includes full coverage of advanced topics, such as mixed and generalized linear models, Bayesian linear models, two-way models with empty cells, geometry of least squares, vector-matrix calculus, simultaneous inference, and logistic and nonlinear regression. Algebraic, geometrical, frequentist, and Bayesian approaches to both the inference of linear models and the analysis of variance are also illustrated. Through the expansion of relevant material and the inclusion of the latest technological developments in the field, this book provides readers with the theoretical foundation to correctly interpret computer software output as well as effectively use, customize, and understand linear models. This modern Second Edition features: New chapters on Bayesian linear models as well as random and mixed linear models Expanded discussion of two-way models with empty cells Additional sections on the geometry of least squares Updated coverage of simultaneous inference The book is complemented with easy-to-read proofs, real data sets, and an extensive bibliography. A thorough review of the requisite matrix algebra has been added for transitional purposes, and numerous theoretical and applied problems have been incorporated with selected answers provided at the end of the book. A related Web site includes additional data sets and SAS® code for all numerical examples. *Linear Model in Statistics, Second Edition* is a must-have book for courses in statistics, biostatistics, and mathematics at the upper-undergraduate and graduate levels. It is also an invaluable reference for researchers who need to gain a better understanding of regression and analysis of variance.

STATISTICAL FOUNDATIONS OF DATA SCIENCE

CRC Press **Statistical Foundations of Data Science** gives a thorough introduction to commonly used statistical models, contemporary statistical machine learning techniques and algorithms, along with their mathematical insights and statistical theories. It aims to serve as a graduate-level textbook and a research monograph on high-dimensional statistics, sparsity and covariance learning, machine learning, and statistical inference. It includes ample exercises that involve both theoretical studies as well as empirical applications. The book begins with an introduction to the stylized features of big data and their impacts on statistical analysis. It then introduces multiple linear regression and expands the techniques of model building via nonparametric regression and kernel tricks. It provides a comprehensive

account on sparsity explorations and model selections for multiple regression, generalized linear models, quantile regression, robust regression, hazards regression, among others. High-dimensional inference is also thoroughly addressed and so is feature screening. The book also provides a comprehensive account on high-dimensional covariance estimation, learning latent factors and hidden structures, as well as their applications to statistical estimation, inference, prediction and machine learning problems. It also introduces thoroughly statistical machine learning theory and methods for classification, clustering, and prediction. These include CART, random forests, boosting, support vector machines, clustering algorithms, sparse PCA, and deep learning.

LOSS MODELS

FROM DATA TO DECISIONS

John Wiley & Sons

STATISTICS FOR SPATIAL DATA

John Wiley & Sons The Wiley Classics Library consists of selected books that have been made more accessible to consumers in an effort to increase global appeal and general circulation. With these new unabridged softcover volumes, Wiley hopes to extend the lives of these works by making them available to future generations of statisticians, mathematicians, and scientists. Spatial statistics — analyzing spatial data through statistical models — has proven exceptionally versatile, encompassing problems ranging from the microscopic to the astronomic. However, for the scientist and engineer faced only with scattered and uneven treatments of the subject in the scientific literature, learning how to make practical use of spatial statistics in day-to-day analytical work is very difficult. Designed exclusively for scientists eager to tap into the enormous potential of this analytical tool and upgrade their range of technical skills, *Statistics for Spatial Data* is a comprehensive, single-source guide to both the theory and applied aspects of spatial statistical methods. The hard-cover edition was hailed by *Mathematical Reviews* as an "excellent book which will become a basic reference." This paper-back edition of the 1993 edition, is designed to meet the many technological challenges facing the scientist and engineer. Concentrating on the three areas of geostatistical data, lattice data, and point patterns, the book sheds light on the link between data and model, revealing how design, inference, and diagnostics are an outgrowth of that link. It then explores new methods to reveal just how spatial statistical models can be used to solve important problems in a host of areas in science and engineering. Discussion

includes: Exploratory spatial data analysis Spectral theory for stationary processes Spatial scale Simulation methods for spatial processes Spatial bootstrapping Statistical image analysis and remote sensing Computational aspects of model fitting Application of models to disease mapping Designed to accommodate the practical needs of the professional, it features a unified and common notation for its subject as well as many detailed examples woven into the text, numerous illustrations (including graphs that illuminate the theory discussed) and over 1,000 references. Fully balancing theory with applications, *Statistics for Spatial Data, Revised Edition* is an exceptionally clear guide on making optimal use of one of the ascendant analytical tools of the decade, one that has begun to capture the imagination of professionals in biology, earth science, civil, electrical, and agricultural engineering, geography, epidemiology, and ecology.

SPATIAL STATISTICS AND MODELING

Springer Science & Business Media **Spatial statistics** are useful in subjects as diverse as climatology, ecology, economics, environmental and earth sciences, epidemiology, image analysis and more. This book covers the best-known spatial models for three types of spatial data: geostatistical data (stationarity, intrinsic models, variograms, spatial regression and space-time models), areal data (Gibbs-Markov fields and spatial auto-regression) and point pattern data (Poisson, Cox, Gibbs and Markov point processes). The level is relatively advanced, and the presentation concise but complete. The most important statistical methods and their asymptotic properties are described, including estimation in geostatistics, autocorrelation and second-order statistics, maximum likelihood methods, approximate inference using the pseudo-likelihood or Monte-Carlo simulations, statistics for point processes and Bayesian hierarchical models. A chapter is devoted to Markov Chain Monte Carlo simulation (Gibbs sampler, Metropolis-Hastings algorithms and exact simulation). A large number of real examples are studied with R, and each chapter ends with a set of theoretical and applied exercises. While a foundation in probability and mathematical statistics is assumed, three appendices introduce some necessary background. The book is accessible to senior undergraduate students with a solid math background and Ph.D. students in statistics. Furthermore, experienced statisticians and researchers in the above-mentioned fields will find the book valuable as a mathematically sound reference. This book is the English translation of *Modélisation et Statistique Spatiales* published by Springer in the series *Mathématiques & Applications*, a series established by *Société de Mathématiques Appliquées et Industrielles (SMAI)*.

INTRODUCTION TO DATA SCIENCE

DATA ANALYSIS AND PREDICTION ALGORITHMS WITH R

CRC Press **Introduction to Data Science: Data Analysis and Prediction Algorithms with R** introduces concepts and skills that can help you tackle real-world data analysis challenges. It covers concepts from probability, statistical inference, linear regression, and machine learning. It also helps you develop skills such as R programming, data wrangling, data visualization, predictive algorithm building, file organization with UNIX/Linux shell, version control with Git and GitHub, and reproducible document preparation. This book is a textbook for a first course in data science. No previous knowledge of R is necessary, although some experience with programming may be helpful. The book is divided into six parts: R, data visualization, statistics with R, data wrangling, machine learning, and productivity tools. Each part has several chapters meant to be presented as one lecture. The author uses motivating case studies that realistically mimic a data scientist's experience. He starts by asking specific questions and answers these through data analysis so concepts are learned as a means to answering the questions. Examples of the case studies included are: US murder rates by state, self-reported student heights, trends in world health and economics, the impact of vaccines on infectious disease rates, the financial crisis of 2007-2008, election forecasting, building a baseball team, image processing of hand-written digits, and movie recommendation systems. The statistical concepts used to answer the case study questions are only briefly introduced, so complementing with a probability and statistics textbook is highly recommended for in-depth understanding of these concepts. If you read and understand the chapters and complete the exercises, you will be prepared to learn the more advanced concepts and skills needed to become an expert.

MODELS FOR DISCRETE LONGITUDINAL DATA

Springer Science & Business Media **The linear mixed model** has become the main parametric tool for the analysis of continuous longitudinal data, as the authors discussed in their 2000 book. Without putting too much emphasis on software, the book shows how the different approaches can be implemented within the SAS software package. The authors received the American Statistical Association's Excellence in Continuing Education Award based on short courses on longitudinal and incomplete data at the Joint Statistical Meetings of 2002 and 2004.

METHODS OF STATISTICAL MODEL ESTIMATION

CRC Press **Methods of Statistical Model Estimation** examines the most important and popular methods used to estimate parameters for statistical models and provide informative model summary statistics. Designed for R users, the book is also ideal for anyone wanting to better understand the algorithms used for statistical model fitting. The text presents algorithm

STOCHASTIC MODELS, STATISTICS AND THEIR APPLICATIONS

WROCŁAW, POLAND, FEBRUARY 2015

Springer This volume presents the latest advances and trends in stochastic models and related statistical procedures. Selected peer-reviewed contributions focus on statistical inference, quality control, change-point analysis and detection, empirical processes, time series analysis, survival analysis and reliability, statistics for stochastic processes, big data in technology and the sciences, statistical genetics, experiment design, and stochastic models in engineering. Stochastic models and related statistical procedures play an important part in furthering our understanding of the challenging problems currently arising in areas of application such as the natural sciences, information technology, engineering, image analysis, genetics, energy and finance, to name but a few. This collection arises from the 12th Workshop on Stochastic Models, Statistics and Their Applications, Wroclaw, Poland.

STATISTICAL MODELS BASED ON COUNTING PROCESSES

Springer Science & Business Media **Modern survival analysis and more general event history analysis may be effectively handled within the mathematical framework of counting processes.** This book presents this theory, which has been the subject of intense research activity over the past 15 years. The exposition of the theory is integrated with careful presentation of many practical examples, drawn almost exclusively from the authors' own experience, with detailed numerical and graphical illustrations. Although **Statistical Models Based on Counting Processes** may be viewed as a research monograph for mathematical statisticians and biostatisticians, almost all the methods are given in concrete detail for use in practice by other mathematically oriented researchers studying event histories (demographers, econometricians, epidemiologists, actuarial mathematicians, reliability engineers and biologists). Much of the material has so far only been available in the journal literature (if at all), and so a wide variety of researchers will find this an

invaluable survey of the subject.

REGRESSION MODELING STRATEGIES

WITH APPLICATIONS TO LINEAR MODELS, LOGISTIC REGRESSION, AND SURVIVAL ANALYSIS

Springer Science & Business Media Many texts are excellent sources of knowledge about individual statistical tools, but the art of data analysis is about choosing and using multiple tools. Instead of presenting isolated techniques, this text emphasizes problem solving strategies that address the many issues arising when developing multivariable models using real data and not standard textbook examples. It includes imputation methods for dealing with missing data effectively, methods for dealing with nonlinear relationships and for making the estimation of transformations a formal part of the modeling process, methods for dealing with "too many variables to analyze and not enough observations," and powerful model validation techniques based on the bootstrap. This text realistically deals with model uncertainty and its effects on inference to achieve "safe data mining".

STATISTICAL MODELS FOR DATA ANALYSIS

Springer Science & Business Media The papers in this book cover issues related to the development of novel statistical models for the analysis of data. They offer solutions for relevant problems in statistical data analysis and contain the explicit derivation of the proposed models as well as their implementation. The book assembles the selected and refereed proceedings of the biannual conference of the Italian Classification and Data Analysis Group (CLADAG), a section of the Italian Statistical Society.

STATISTICS IN THE 21ST CENTURY

CRC Press Exactly what is the state of the art in statistics as we move forward into the 21st century? What promises, what trends does its future hold? Through the reflections of 70 of the world's leading statistical methodologists, researchers, theorists, and practitioners, *Statistics in the 21st Century* answers those questions. Originally published in the *Journal of the American Statistical Association*, this collection of vignettes examines our statistical past, comments on our present, and speculates on our future. Although the coverage is broad and the topics diverse, it reveals the essential intellectual unity of the field as we see the same themes recurring in different contexts. We see

how the development of statistics has been driven by the unprecedented and still growing range of applications, by the explosion in computer technology, and by the new types of data that continue to emerge and advance the discipline. Organized around major areas of application and leading up to vignettes on theory and methods, *Statistics in the 21st Century* forms a landmark record of the progress and perceived future of the discipline. No student, researcher, or practitioner of statistics should miss this extraordinary opportunity to view the past, present, and future world of statistics through the eyes of its foremost thinkers.

HOW TO LIE WITH STATISTICS

W. W. Norton & Company If you want to outsmart a crook, learn his tricks—Darrell Huff explains exactly how in the classic *How to Lie with Statistics*. From distorted graphs and biased samples to misleading averages, there are countless statistical dodges that lend cover to anyone with an ax to grind or a product to sell. With abundant examples and illustrations, Darrell Huff's lively and engaging primer clarifies the basic principles of statistics and explains how they're used to present information in honest and not-so-honest ways. Now even more indispensable in our data-driven world than it was when first published, *How to Lie with Statistics* is the book that generations of readers have relied on to keep from being fooled.

OPENINTRO STATISTICS

The OpenIntro project was founded in 2009 to improve the quality and availability of education by producing exceptional books and teaching tools that are free to use and easy to modify. We feature real data whenever possible, and files for the entire textbook are freely available at openintro.org. Visit our website, openintro.org. We provide free videos, statistical software labs, lecture slides, course management tools, and many other helpful resources.

INTERPRETABLE MACHINE LEARNING

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STATISTICAL LEARNING WITH SPARSITY

THE LASSO AND GENERALIZATIONS

CRC Press **Discover New Methods for Dealing with High-Dimensional Data** A sparse statistical model has only a small number of nonzero parameters or weights; therefore, it is much easier to estimate and interpret than a dense model. **Statistical Learning with Sparsity: The Lasso and Generalizations** presents methods that exploit sparsity to help recover the underlying signal in a set of data. Top experts in this rapidly evolving field, the authors describe the lasso for linear regression and a simple coordinate descent algorithm for its computation. They discuss the application of l_1 penalties to generalized linear models and support vector machines, cover generalized penalties such as the elastic net and group lasso, and review numerical methods for optimization. They also present statistical inference methods for fitted (lasso) models, including the bootstrap, Bayesian methods, and recently developed approaches. In addition, the book examines matrix decomposition, sparse multivariate analysis, graphical models, and compressed sensing. It concludes with a survey of theoretical results for the lasso. In this age of big data, the number of features measured on a person or object can be large and might be larger than the number of observations. This book shows how the sparsity assumption allows us to tackle these problems and extract useful and reproducible patterns from big datasets. Data analysts, computer scientists, and theorists will appreciate this thorough and up-to-date treatment of sparse statistical modeling.

STATISTICAL INFERENCE VIA DATA SCIENCE

A MODERNDIVE INTO R AND THE TIDYVERSE

CRC Press "**Statistical Inference via Data Science: A ModernDive into R and the Tidyverse** provides a pathway for learning about statistical inference using data science tools widely used in industry, academia, and government. It introduces the tidyverse suite of R packages, including the ggplot2 package for data visualization, and the dplyr package for data wrangling. After equipping readers with just enough of these data science tools to perform effective exploratory data analyses, the book covers traditional introductory statistics topics like confidence intervals, hypothesis testing, and multiple regression modeling, while focusing on visualization throughout"--

HANDBOOK OF PROBABILISTIC MODELS

Butterworth-Heinemann **Handbook of Probabilistic Models** carefully examines the application of advanced probabilistic

models in conventional engineering fields. In this comprehensive handbook, practitioners, researchers and scientists will find detailed explanations of technical concepts, applications of the proposed methods, and the respective scientific approaches needed to solve the problem. This book provides an interdisciplinary approach that creates advanced probabilistic models for engineering fields, ranging from conventional fields of mechanical engineering and civil engineering, to electronics, electrical, earth sciences, climate, agriculture, water resource, mathematical sciences and computer sciences. Specific topics covered include minimax probability machine regression, stochastic finite element method, relevance vector machine, logistic regression, Monte Carlo simulations, random matrix, Gaussian process regression, Kalman filter, stochastic optimization, maximum likelihood, Bayesian inference, Bayesian update, kriging, copula-statistical models, and more. Explains the application of advanced probabilistic models encompassing multidisciplinary research Applies probabilistic modeling to emerging areas in engineering Provides an interdisciplinary approach to probabilistic models and their applications, thus solving a wide range of practical problems

STATS

MODELING THE WORLD

Pearson This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Clear, accessible, and teachable, **Stats: Modeling the World** leads with practical data analysis and graphics to engage students and get them thinking statistically from the start. Through updated, relevant examples and data—and the authors' signature Think, Show, and Tell problem-solving method—students learn what we can find in data, why we find it interesting, and how to report it to others. The new Fourth Edition is even more engaging than previous editions, builds on the innovative features that have made the first three editions so popular, and includes revisions designed to make it even easier for students to put the concepts of statistics together in a coherent whole.

USING R FOR INTRODUCTORY STATISTICS, SECOND EDITION

CRC Press The second edition of a bestselling textbook, **Using R for Introductory Statistics** guides students through the basics of R, helping them overcome the sometimes steep learning curve. The author does this by breaking the material down into small, task-oriented steps. The second edition maintains the features that made the first edition so popular,

while updating data, examples, and changes to R in line with the current version. See What's New in the Second Edition: Increased emphasis on more idiomatic R provides a grounding in the functionality of base R. Discussions of the use of RStudio helps new R users avoid as many pitfalls as possible. Use of knitr package makes code easier to read and therefore easier to reason about. Additional information on computer-intensive approaches motivates the traditional approach. Updated examples and data make the information current and topical. The book has an accompanying package, UsingR, available from CRAN, R's repository of user-contributed packages. The package contains the data sets mentioned in the text (`data(package="UsingR")`), answers to selected problems (`answers()`), a few demonstrations (`demo()`), the errata (`errata()`), and sample code from the text. The topics of this text line up closely with traditional teaching progression; however, the book also highlights computer-intensive approaches to motivate the more traditional approach. The authors emphasize realistic data and examples and rely on visualization techniques to gather insight. They introduce statistics and R seamlessly, giving students the tools they need to use R and the information they need to navigate the sometimes complex world of statistical computing.

DATA SCIENCE: THEORY AND APPLICATIONS

Elsevier **Data Science: Theory and Applications**, Volume 44 in the Handbook of Statistics series, highlights new advances in the field, with this new volume presenting interesting chapters on a variety of interesting topics, including Modeling extreme climatic events using the generalized extreme value distribution, Bayesian Methods in Data Science, Mathematical Modeling in Health Economic Evaluations, Data Science in Cancer Genomics, Blockchain Technology: Theory and Practice, Statistical outline of animal home ranges, an application of set estimation, Application of Data Handling Techniques to Predict Pavement Performance, Analysis of individual treatment effects for enhanced inferences in medicine, and more. Additional sections cover Nonparametric Data Science: Testing Hypotheses in Large Complex Data, From Urban Mobility Problems to Data Science Solutions, and Data Structures and Artificial Intelligence Methods. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the Handbook of Statistics series Updated release includes the latest information on Data Science: Theory and Applications

EPIDEMICS

MODELS AND DATA USING R

Springer This book is designed to be a practical study in infectious disease dynamics. The book offers an easy to follow implementation and analysis of mathematical epidemiology. The book focuses on recent case studies in order to explore various conceptual, mathematical, and statistical issues. The dynamics of infectious diseases shows a wide diversity of pattern. Some have locally persistent chains-of-transmission, others persist spatially in 'consumer-resource metapopulations'. Some infections are prevalent among the young, some among the old and some are age-invariant. Temporally, some diseases have little variation in prevalence, some have predictable seasonal shifts and others exhibit violent epidemics that may be regular or irregular in their timing. Models and 'models-with-data' have proved invaluable for understanding and predicting this diversity, and thence help improve intervention and control. Using mathematical models to understand infectious disease dynamics has a very rich history in epidemiology. The field has seen broad expansions of theories as well as a surge in real-life application of mathematics to dynamics and control of infectious disease. The chapters of *Epidemics: Models and Data using R* have been organized in a reasonably logical way: Chapters 1-10 is a mix and match of models, data and statistics pertaining to local disease dynamics; Chapters 11-13 pertains to spatial and spatiotemporal dynamics; Chapter 14 highlights similarities between the dynamics of infectious disease and parasitoid-host dynamics; Finally, Chapters 15 and 16 overview additional statistical methodology useful in studies of infectious disease dynamics. This book can be used as a guide for working with data, models and 'models-and-data' to understand epidemics and infectious disease dynamics in space and time.

STATISTICAL ANALYSIS OF NETWORK DATA

METHODS AND MODELS

Springer Science & Business Media In recent years there has been an explosion of network data - that is, measurements that are either of or from a system conceptualized as a network - from seemingly all corners of science. The combination of an increasingly pervasive interest in scientific analysis at a systems level and the ever-growing capabilities for high-throughput data collection in various fields has fueled this trend. Researchers from biology and bioinformatics to physics, from computer science to the information sciences, and from economics to sociology are more and more engaged in the collection and statistical analysis of data from a network-centric perspective. Accordingly, the contributions to statistical methods and modeling in this area have come from a similarly broad spectrum of areas,

often independently of each other. Many books already have been written addressing network data and network problems in specific individual disciplines. However, there is at present no single book that provides a modern treatment of a core body of knowledge for statistical analysis of network data that cuts across the various disciplines and is organized rather according to a statistical taxonomy of tasks and techniques. This book seeks to fill that gap and, as such, it aims to contribute to a growing trend in recent years to facilitate the exchange of knowledge across the pre-existing boundaries between those disciplines that play a role in what is coming to be called 'network science.

CHINA STATISTICAL YEARBOOK
