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Bayesian Statistical Modelling - Peter Congdon 2007-04-04

Bayesian methods combine the evidence from the data at hand with previous quantitative knowledge to analyse practical problems in a wide range of areas. The calculations were previously complex, but it is now possible to routinely apply Bayesian methods due to advances in computing technology and the use of new sampling methods for estimating parameters. Such developments together with the availability of freeware such as WINBUGS and R have facilitated a rapid growth in the use of Bayesian methods, allowing their application in many scientific disciplines, including applied statistics, public health research, medical science, the social sciences and economics. Following the success of the first edition, this reworked and updated book provides an accessible approach to Bayesian computing and analysis, with an emphasis on the principles of prior selection, identification and the interpretation of real data sets. The second edition: Provides an integrated presentation of theory, examples, applications and computer algorithms. Discusses the role of Markov Chain Monte Carlo methods in computing and estimation. Includes a wide range of interdisciplinary applications, and a large selection of worked examples from the health and social sciences. Features a comprehensive range of methodologies and modelling techniques, and examines model fitting in practice using Bayesian principles. Provides exercises designed to help reinforce the reader's knowledge and a supplementary website containing data sets and relevant programs. Bayesian Statistical Modelling is ideal for researchers in applied statistics, medical science, public health and the social sciences, who will benefit greatly from the examples and applications featured. The book will also appeal to graduate students of applied statistics, data analysis and Bayesian methods, and will provide a great source of reference for both researchers and students. Praise for the First Edition: "It is a remarkable achievement to have carried out such a range of analysis on such a range of data sets. I found this book comprehensive and stimulating, and was thoroughly impressed with both the depth and the range of the discussions it contains." – ISI - Short Book Reviews "This is an excellent introductory book on Bayesian modelling techniques and data analysis" – Biometrics "The book fills an important niche in the statistical literature and should be a very valuable resource for students and professionals who are utilizing Bayesian methods." – Journal of Mathematical Psychology

Sensitivity Analysis in Linear Regression - Samprit Chatterjee 1988-03-31

Treats linear regression diagnostics as a tool for application of linear regression models to real-life data. Presentation makes extensive use of examples to illustrate theory. Assesses the effect of measurement errors on the estimated coefficients, which is not accounted for in a standard least squares estimate but is important where regression coefficients are used to apportion effects due to different variables. Also assesses qualitatively and numerically the robustness of the regression fit.

Simulation Modeling Using @Risk - Wayne L. Winston 1996

Multivariate Statistical Simulation - Mark E. Johnson 2013-11-11

Provides state-of-the-art coverage for the researcher confronted with designing and executing a simulation study using continuous multivariate distributions. Concise writing style makes the book accessible to a wide audience. Well-known multivariate distributions are described, emphasizing a few representative cases from each distribution. Coverage includes Pearson Types II and VII elliptically contoured distributions, Khintchine distributions, and the unifying class for the Burr, Pareto, and logistic distributions. Extensively illustrated--the figures are unique, attractive, and reveal very nicely what distributions ``look like.'' Contains an extensive and up-to-date bibliography culled from journals in statistics, operations research, mathematics, and computer science.

Simulation Modeling and Analysis - Averill M. Law 2007

Since the publication of the first edition in 1982, the goal of Simulation Modeling and Analysis has always been to provide a comprehensive, state-of-the-art, and technically correct treatment of all important aspects of a simulation study. The book strives to make this material understandable by the use of intuition and numerous figures, examples, and problems. It is equally well suited for use in university courses, simulation practice, and self study. The book is widely regarded as the "bible" of simulation and now has more than 100,000 copies in print. The book can serve as the primary text for a variety of courses; for example: *A first course in simulation at the junior, senior, or beginning-graduate-student level in engineering, manufacturing, business, or computer science (Chaps. 1 through 4, and parts of Chaps. 5 through 9). At the end of such a course, the students will be prepared to carry out complete and effective simulation studies, and to take advanced simulation courses. *A second course in simulation for graduate students in any of the above disciplines (most of Chaps. 5 through 12). After completing this course, the student should be familiar with the more advanced methodological issues involved in a simulation study, and should be prepared to understand and conduct simulation research. *An introduction to simulation as part of a general course in operations research or management science (part of Chaps. 1, 3, 5, 6, and 9).

Logistic Regression Models - Joseph M. Hilbe 2009-05-11

Logistic Regression Models presents an overview of the full range of logistic models, including binary, proportional, ordered, partially ordered, and unordered categorical response regression procedures. Other topics discussed include panel, survey, skewed, penalized, and exact logistic models. The text illustrates how to apply the various models to health, environmental, physical, and social science data. Examples illustrate successful modeling The text first provides basic terminology and concepts, before explaining the foremost methods of estimation (maximum likelihood and IRLS) appropriate for logistic models. It then presents an in-depth discussion of related terminology and examines logistic regression model development and interpretation of the results. After focusing on the construction and interpretation of various interactions, the author evaluates assumptions and goodness-of-fit tests that can be used for model assessment. He also covers binomial logistic regression, varieties of overdispersion, and a number of extensions to the basic binary and binomial logistic model. Both real and simulated data are used to explain and test the concepts involved. The appendices give an overview of marginal effects and discrete change as well as a 30-page tutorial on using Stata commands related to the examples used in the text. Stata is used for most examples while R is provided at the end of the chapters to replicate examples in the text. Apply the models to your own data Data files for examples and questions used in the text as well as code for user-authored commands are provided on the book's website, formatted in Stata, R, Excel, SAS, SPSS, and Limdep. See Professor Hilbe discuss the book.

Simulation - Sheldon M. Ross 2006

Introduces practising actuaries, engineers, computer scientists and others to the practical aspects of constructing computerized simulation studies to analyze and interpret real phenomena. This text explains how a computer can be used to generate random numbers, and how to use these random numbers to generate the behavior of a stochastic model

Introduction to Statistical Methods for Financial Models - Thomas A Severini 2017-07-06

This book provides an introduction to the use of statistical concepts and methods to model and analyze financial data. The ten chapters of the book fall naturally into three sections. Chapters 1 to 3 cover some basic concepts of finance, focusing on the properties of returns on an asset. Chapters 4 through 6 cover aspects of portfolio theory and the methods of estimation needed to implement that theory. The remainder of the book, Chapters 7 through 10, discusses several models for financial data, along with the implications of those models for portfolio theory and for understanding the properties of return data. The audience for the book is students majoring in Statistics and Economics as well as in quantitative fields such as Mathematics and Engineering. Readers are assumed to have some background in statistical methods along with courses in multivariate calculus and linear algebra.

Essentials of Business Analytics - Jeffrey D. Camm 2016-03-24

ESSENTIALS OF BUSINESS ANALYTICS, 2e can be used by students who have previously taken a course on basic statistical methods as well as students who have not had a prior course in statistics. The expanded material in the second edition of Essentials of Business Analytics also makes it amenable to a two-course sequence in business statistics and analytics. All statistical concepts contained in this textbook are presented from a business analytics perspective using practical business examples. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Essential Statistics - D.G. Rees 2018-10-03

An introductory text for students taking a first course in statistics-in fields as diverse as engineering, business, chemistry, and biology-Essential Statistics: Fourth Edition thoroughly updates and enhances the hugely successful third edition. It presents new information on modern statistical techniques such as Analysis of Variance (ANOVA), and software such as MINITABTM for WINDOWS. An experienced former lecturer, the author communicates to students in his trademark easy-to-follow style. Keeping complex mathematical theory to a minimum, Rees presents a wealth of fully explained worked examples throughout the text. In addition, the end-of-chapter Worksheets relate to a variety of fields-enabling students to see the relevance of the numerous methods to their study areas. Essential Statistics: Fourth Edition emphasizes the principles and assumptions underlying the statistical methods, thus providing the tools needed for students to use and interpret statistical data effectively.

Stochastic Modeling and Mathematical Statistics - Francisco J. Samaniego 2014-01-14

Provides a Solid Foundation for Statistical Modeling and Inference and Demonstrates Its Breadth of Applicability Stochastic Modeling and Mathematical Statistics: A Text for Statisticians and Quantitative Scientists addresses core issues in post-calculus probability and statistics in a way that is useful for statistics and mathematics majors as well

Statistics in Research and Development - R. Caulcutt 2014-07-22

Many scientists and technologists would like to carry out their own statistical analyses without reference to a professional statistician. Often, however, they have no knowledge of statistics or otherwise do not know how to apply it to research and development problems. The first edition of Statistics in Research and Development was written for these people.

The second edition brings the book up-to-date. The text is divided into two parts; the first introduces basic but very important statistical techniques whilst the second part presents the modern powerful methods of data analysis that are particularly useful in modern research and development. Problems are provided at the end of each chapter with worked solutions provided at the end of the book. A problem-centered approach is used throughout and care has been taken to choose problems with which the scientist or technologist can identify. The results of the statistical analyses are reinterpreted into the language of the scientist. Mathematics is kept to a minimum and the assumptions underlying each technique are clearly explained. All the techniques introduced are powerful and proven, and commercial computer programs are available for many of them.

A Primer on Linear Models - John F. Monahan 2008-03-31

A Primer on Linear Models presents a unified, thorough, and rigorous development of the theory behind the statistical methodology of regression and analysis of variance (ANOVA). It seamlessly incorporates these concepts using non-full-rank design matrices and emphasizes the exact, finite sample theory supporting common statistical methods.

Probability Modeling and Computer Simulation - Norman S. Matloff 1988

Methods for Statistical Data Analysis of Multivariate Observations - R. Gnanadesikan 1997-02-04

A practical guide for multivariate statistical techniques-- nowupdated and revised In recent years, innovations in computer technology and statisticalmethodologies have dramatically altered the landscape ofmultivariate data analysis. This new edition of Methods forStatistical Data Analysis of Multivariate Observations explorescurrent multivariate concepts and techniques while retaining thesame practical focus of its predecessor. It integrates methods anddata-based interpretations relevant to multivariate analysis in away that addresses real-world problems arising in many areas ofinterest. Greatly revised and updated, this Second Edition provides helpfulexamples, graphical orientation, numerous illustrations, and anappendix detailing statistical software, including the S (or Splus)and SAS systems. It also offers * An expanded chapter on cluster analysis that covers advances inpattern recognition * New sections on inputs to clustering algorithms and aids forinterpreting the results of cluster analysis * An exploration of some new techniques of summarization andexposure * New graphical methods for assessing the separations among theeigenvalues of a correlation matrix and for comparing sets ofeigenvectors * Knowledge gained from advances in robust estimation anddistributional models that are slightly broader than themultivariate normal This Second Edition is invaluable for graduate students, appliedstatisticians, engineers, and scientists wishing to usemultivariate techniques in a variety of disciplines.

Nonlinear Statistical Models - A. Ronald Gallant 2009-09-25

A comprehensive text and reference bringing together advances in the theory of probability and statistics and relating them to applications. The three major categories of statistical models that relate dependent variables to explanatory variables are covered: univariate regression models, multivariate regression models, and simultaneous equations models. Methods are illustrated with worked examples, complete with figures that display code and output.

Non-Standard Parametric Statistical Inference - Russell Cheng 2017-09-15

This book discusses the fitting of parametric statistical models to data samples. Emphasis is placed on: (i) how to recognize situations where the problem is non-standard when parameter estimates behave unusually, and (ii) the use of parametric bootstrap resampling methods in analyzing such problems. A frequentist likelihood-based viewpoint is adopted, for which there is a well-established and very practical theory. The standard situation is where certain widely applicable regularity conditions hold. However, there are many apparently innocuous situations where standard theory breaks down, sometimes spectacularly. Most of the departures from regularity are described geometrically, with only sufficient mathematical detail to clarify the non-standard nature of a problem and to allow formulation of practical solutions. The book is intended for anyone with a basic knowledge of statistical methods, as is typically covered in a university statistical inference course, wishing to understand or study how standard methodology might fail. Easy to understand statistical methods are presented which overcome these difficulties, and demonstrated by detailed examples drawn from real applications. Simple and practical model-building is an underlying theme. Parametric bootstrap resampling is used throughout for analyzing the properties of fitted models, illustrating its ease of implementation even in non-standard situations. Distributional properties are obtained numerically for estimators or statistics not previously considered in the literature because their theoretical distributional properties are too hard to obtain theoretically. Bootstrap results are presented mainly graphically in the book, providing an accessible demonstration of the sampling behaviour of estimators.

Computer-Aided Multivariate Analysis, Fourth Edition - Abdelmonem Afifi 2003-12-29

Computer-Aided Multivariate Analysis, Fourth Edition enables researchers and students with limited mathematical backgrounds to understand the concepts underlying multivariate statistical analysis, perform analysis using statistical packages, and understand the output. New topics include Loess and Poisson regression, nominal and ordinal logistic regression, interpretation of interactions in logistic and survival analysis, and imputation for missing values. This book includes new exercises and references, and updated options in the latest versions of the statistical packages. All data sets and codebooks are available for download. The authors explain the assumptions made in performing each analysis and test, how to determine if your data meets those assumptions, and what to do if they do not. What to Watch out for sections in each chapter warn of common difficulties. By reading this text, you will know what method to use with your data set, how to get the results, and how to interpret them and explain them to others. New in the Fourth Edition: Expanded explanation of checking for goodness of fit in logistic regression and survival analysis Kaplan-Meier estimates of survival curves, formal tests for comparing survival between groups, interactions and the use of time-dependent covariates in survival analysis Expanded discussion of how to handle missing values Latest features of the S-PLUS package in addition to SAS, SPSS, STATA, and STATISTICA for multivariate analysis Data sets for the problems are available at the CRC web site: http://www.crcpress.com/product/isbn/9781584883081 Commands and output for examples used in the text for each statistical package are available at the UCLA web site: http://www.ats.ucla.edu/stat/examples/cama4/

Underwater Acoustic Modeling and Simulation, Fourth Edition - Paul C. Etter 2013-02-21

Underwater Acoustic Modeling and Simulation, Fourth Edition continues to provide the most authoritative overview of currently available propagation, noise, reverberation, and sonar-performance models. This fourth edition of a bestseller discusses the fundamental processes involved in simulating the performance of underwater acoustic systems and emphasizes the importance of applying the proper modeling resources to simulate the behavior of sound in virtual ocean environments. New to the Fourth Edition Extensive new material that addresses recent advances in inverse techniques and marine-mammal protection Problem sets in each chapter Updated and expanded inventories of available models Designed for readers with an understanding of underwater acoustics but who are unfamiliar with the various aspects of modeling, the book includes sufficient mathematical derivations to demonstrate model formulations and provides guidelines for selecting and using the models. Examples of each type of model illustrate model formulations, model assumptions, and algorithm efficiency. Simulation case studies are also included to demonstrate practical applications. Providing a thorough source of information on modeling resources, this book examines the translation of our physical understanding of sound in the sea into mathematical models that simulate acoustic propagation, noise, and reverberation in the ocean. The text shows how these models are used to predict and diagnose the performance of complex sonar systems operating in the undersea environment.

Loss Models - Stuart A. Klugman 2012-09-04

Praise for the Third Edition "This book provides in-depth coverage of modelling techniques used throughout many branches of actuarial science. . . . The exceptional high standard of this book has made it a pleasure to read." —Annals of Actuarial Science Newly organized to focus exclusively on material tested in the Society of Actuaries' Exam C and the Casualty Actuarial Society's Exam 4, Loss Models: From Data to Decisions, Fourth Edition continues to supply actuaries with a practical approach to the key concepts and techniques needed on the job. With updated material and extensive examples, the book successfully provides the essential methods for using available data to construct models for the frequency and severity of future adverse outcomes. The book continues to equip readers with the tools needed for the construction and analysis of mathematical models that describe the process by which funds flow into and out of an insurance system. Focusing on the loss process, the authors explore key quantitative techniques including random variables, basic distributional quantities, and the recursive method, and discuss techniques for classifying and creating distributions. Parametric, non-parametric, and Bayesian estimation methods are thoroughly covered along with advice for choosing an appropriate model. New features of this Fourth Edition include: Expanded discussion of working with large data sets, now including more practical elements of constructing decrement tables Added coverage of methods for simulating several special situations An updated presentation of Bayesian estimation, outlining conjugate prior distributions and the linear exponential family as well as related computational issues Throughout the book, numerous examples showcase the real-world applications of the presented concepts, with an emphasis on calculations and spreadsheet implementation. A wealth of new exercises taken from previous Exam C/4 exams allows readers to test their comprehension of the material, and a related FTP site features the book's data sets. Loss Models, Fourth Edition is an indispensable resource for students and aspiring actuaries who are preparing to take the SOA and CAS examinations. The book is also a valuable reference for professional actuaries, actuarial students, and anyone who works with loss and risk models. To explore our additional offerings in actuarial exam preparation visit www.wiley.com/go/c4actuarial .

Statistical Methods for Spatial Data Analysis - Oliver Schabenberger 2017-01-27

Understanding spatial statistics requires tools from applied and mathematical statistics, linear model theory, regression, time series, and stochastic processes. It also requires a mindset that focuses on the unique characteristics of spatial data and the development of specialized analytical tools designed explicitly for spatial data analysis. Statistical Methods for Spatial Data Analysis answers the demand for a text that incorporates all of these factors by presenting a balanced exposition that explores both the theoretical foundations of the field of spatial statistics as well as practical methods for the analysis of spatial data. This book is a comprehensive and illustrative treatment of basic statistical theory and methods for spatial data analysis, employing a model-based and frequentist approach that emphasizes the spatial domain. It introduces essential tools and approaches including: measures of autocorrelation and their role in data analysis; the background and theoretical framework supporting random fields; the analysis of mapped spatial point patterns; estimation and modeling of the covariance function and semivariogram; a comprehensive treatment of spatial analysis in the spectral domain; and spatial prediction and kriging. The volume also delivers a thorough analysis of spatial regression, providing a detailed development of linear models with uncorrelated errors, linear models with spatially-correlated errors and generalized linear mixed models for spatial data. It succinctly discusses Bayesian hierarchical models and concludes with reviews on simulating random fields, non-stationary covariance, and spatio-temporal processes. Additional material on the CRC Press website supplements the content of this book. The site provides data sets used as examples in the text, software code that can be used to implement many of the principal methods described and illustrated, and updates to the text itself.

Student Solutions Manual to Accompany Loss Models: From Data to Decisions, Fourth Edition - Stuart A. Klugman 2014-08-21

Student Solutions Manual to Accompany Loss Models: From Data to Decisions, Fourth Edition. This volume is organised around the principle that much of actuarial science consists of the construction and analysis of mathematical models which describe the process by which funds flow into and out of an insurance system.

Polya Urn Models - Hosam Mahmoud 2008-06-30

Incorporating a collection of recent results, Pólya Urn Models deals with discrete probability through the modern and evolving urn theory and its numerous applications. The book first substantiates the realization of distributions with urn arguments and introduces several modern tools, including exchangeability and stochastic processes via urns. It reviews classical probability problems and presents dichromatic Pólya urns as a basic discrete structure growing in discrete time. The author then embeds the discrete Pólya urn scheme in Poisson processes to achieve an equivalent view in continuous time, provides heuristical arguments to connect the Pólya process to the discrete urn scheme, and explores extensions and generalizations. He also discusses how functional equations for moment generating functions can be obtained and solved. The final chapters cover applications of urns to computer science and bioscience. Examining how urns can help conceptualize discrete probability principles, this book provides information pertinent to the modeling of dynamically evolving systems where particles come and go according to governing rules.

Linear Models and the Relevant Distributions and Matrix Algebra - David A. Harville 2018-03-22

Linear Models and the Relevant Distributions and Matrix Algebra provides in-depth and detailed coverage of the use of linear statistical models as a basis for parametric and predictive inference. It can be a valuable reference, a primary or secondary text in a graduate-level course on linear models, or a resource used (in a course on mathematical statistics) to illustrate various theoretical concepts in the context of a relatively complex setting of great practical importance. Features: Provides coverage of matrix algebra that is extensive and relatively self-contained and does so in a meaningful context Provides thorough coverage of the relevant statistical distributions, including spherically and elliptically symmetric distributions Includes extensive coverage of multiple-comparison procedures (and of simultaneous confidence intervals), including procedures for controlling the k-FWER and the FDR Provides thorough coverage (complete with detailed and highly accessible proofs) of results on the properties of various linear-model procedures, including those of least squares estimators and those of the F test. Features the use of real data sets for illustrative purposes Includes many exercises David Harville served for 10 years as a mathematical statistician in the Applied Mathematics Research Laboratory of the Aerospace Research Laboratories at Wright-Patterson AFB, Ohio, 20 years as a full professor in Iowa State University's Department of Statistics where he now has emeritus status, and seven years as a research staff member of the Mathematical Sciences Department of IBM's T.J. Watson Research Center. He has considerable relevant experience, having taught M.S. and Ph.D. level courses in linear models, been the thesis advisor of 10 Ph.D. graduates, and authored or co-authored two books and more than 80 research articles. His work has been recognized through his election as a Fellow of the American Statistical Association and of the Institute of Mathematical Statistics and as a member of the International Statistical Institute.

Encyclopedia of Measurement and Statistics - Neil J. Salkind 2007

Publisher Description

Applied Stochastic Modelling, Second Edition - Byron J.T. Morgan 2008-12-02

Highlighting modern computational methods, Applied Stochastic Modelling, Second Edition provides students with the practical experience of scientific computing in applied statistics through a range of interesting real-world applications. It also successfully revises standard probability and statistical theory. Along with an updated bibliography and improved figures, this edition offers numerous updates throughout. New to the Second Edition An extended discussion on Bayesian methods A large number of new exercises A new appendix on computational methods The book covers both contemporary and classical aspects of statistics, including survival analysis, Kernel density estimation, Markov chain Monte Carlo, hypothesis testing, regression, bootstrap, and generalised linear models. Although the book can be used without reference to computational programs, the author provides the option of using powerful computational tools for stochastic modelling. All of the data sets and MATLAB® and R programs found in the text as well as lecture slides and other ancillary material are available for download at www.crcpress.com Continuing in the bestselling tradition of its predecessor, this textbook remains an excellent resource for teaching students how to fit stochastic models to data.

Principles and Practice of Structural Equation Modeling, Fourth Edition - Rex B. Kline 2015-11-03

New to This Edition *Extensively revised to cover important new topics: Pearl' s graphing theory and SCM, causal inference frameworks, conditional process modeling, path models for longitudinal data, item response theory, and more. *Chapters on best practices in all stages of SEM, measurement invariance in confirmatory factor analysis, and significance testing issues and bootstrapping. *Expanded coverage of psychometrics. *Additional computer tools: online files for all detailed examples, previously provided in EQS, LISREL, and Mplus, are now also given in Amos, Stata, and R (lavaan). *Reorganized to cover the specification, identification, and analysis of observed variable models separately from latent variable models. Pedagogical Features *Exercises with answers, plus end-of-chapter annotated lists of further reading. *Real examplesof troublesome data, demonstrating how to handle typical problems in analyses.

Stochastic Simulation - Brian D. Ripley 2009-09-25

WILEY-INTERSCIENCE PAPERBACK SERIES The Wiley-Interscience Paperback Series 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. ". . .this is a very competently written and useful addition to the statistical literature; a book every statistician should look at and that many should study!" —Short Book Reviews, International Statistical Institute ". . .reading this book was an enjoyable learning experience. The suggestions and recommendations on the methods [make] this book an excellent reference for anyone interested in simulation. With its compact structure and good coverage of material, it [is] an excellent textbook for a simulation course." —Technometrics ". . .this work is an excellent comprehensive guide to simulation methods, written by a very competent author. It is especially recommended for those users of simulation methods who want more than a 'cook book'. " —Mathematics Abstracts This book is a comprehensive guide to simulation methods with explicit recommendations of methods and algorithms. It covers both the technical aspects of the subject, such as the generation of random numbers, non-uniform random variates and stochastic processes, and the use of simulation. Supported by the relevant mathematical theory, the text contains a great deal of unpublished research material, including coverage of the analysis of shift-register generators, sensitivity analysis of normal variate generators, analysis of simulation output, and more.

Introduction to Probability with R - Kenneth Baclawski 2008-01-24

Based on a popular course taught by the late Gian-Carlo Rota of MIT, with many new topics covered as well, Introduction to Probability with R presents R programs and animations to provide an intuitive yet rigorous understanding of how to model natural phenomena from a probabilistic point of view. Although the R programs are small in length, they are just as sophisticated and powerful as longer programs in other languages. This brevity makes it easy for students to become proficient in R. This calculus-based introduction organizes the material around key themes. One of the most important themes centers on viewing probability as a way to look at the world, helping students think and reason probabilistically. The text also shows how to combine and link stochastic processes to form more complex processes that are better models of natural phenomena. In addition, it presents a unified treatment of transforms, such as Laplace, Fourier, and z; the foundations of fundamental stochastic processes using entropy and information; and an introduction to Markov chains from various viewpoints. Each chapter includes a short biographical note about a contributor to probability theory, exercises, and selected answers. The book has an accompanying website with more information.

Business Analytics - Jeffrey D. Camm 2020-02-25

Develop the analytical skills that are in high demand in businesses today with Camm/Cochran/Fry/Ohlmann's best-selling BUSINESS ANALYTICS, 4E. You master the full range of analytics as you strengthen your descriptive, predictive and prescriptive analytic skills. Real examples and memorable visuals illustrate data and results for each topic. Step-by-step instructions guide you through using Microsoft Excel, Tableau, R and JMP Pro software to perform more advanced analytics concepts. Practical, relevant problems at all levels of difficulty help you further apply what you've learned. With this edition you become proficient in topics beyond the traditional quantitative concepts, such as data visualization and data mining, which are increasingly important in today's analytical problem-solving. Trust BUSINESS ANALYTICS, 4E to strengthen your understanding of today's analytic concepts. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

An Introduction to Generalized Linear Models - Annette J. Dobson 2008-05-12

Continuing to emphasize numerical and graphical methods, An Introduction to Generalized Linear Models, Third Edition provides a cohesive framework for statistical modeling. This new edition of a bestseller has been updated with Stata, R, and WinBUGS code as well as three new chapters on Bayesian analysis. Like its predecessor, this edition presents the theoretical background of generalized linear models (GLMs) before focusing on methods for analyzing particular kinds of data. It covers normal, Poisson, and binomial distributions; linear regression models; classical estimation and model fitting methods; and frequentist methods of statistical inference. After forming this foundation, the authors explore multiple linear regression, analysis of variance (ANOVA), logistic regression, log-linear models, survival analysis, multilevel modeling, Bayesian models, and Markov chain Monte Carlo (MCMC) methods. Using popular statistical software programs, this concise and accessible text illustrates practical approaches to estimation, model fitting, and model comparisons. It includes examples and exercises with complete data sets for nearly all the models covered.

Large Deviation Techniques in Decision, Simulation, and Estimation - James A. Bucklew 1990-08-15

Random Data Analysis and Measurement Procedures Second Edition Julius S. Bendat and Allan G. Piersol The latest techniques for analysis and measurement of stationary and nonstationary random data passing through physical systems are described in this extensive revision and update. It includes new modern data processing procedures and new statistical error analysis formulas for the evaluation of estimates in single input/output and multiple input/output problems, plus new material on Hilbert transforms, multiple array models, and more. Chapters on statistical errors in basic and advanced estimates represent the most complete derivation and summary of these matters in print. 1986 (0 471-04000-2) 566 pp. Linear Stochastic Systems Peter E. Caines This outstanding text provides a unified and mathematically rigorous exposition of linear stochastic system theory The comprehensive format includes a full treatment of the fundamentals of stochastic processes and the construction of stochastic systems. It then presents an integrated view of the interrelated theories of prediction, realization (or modeling), parameter estimation and control. It also features in-depth coverage of system identification, with chapters on maximum likelihood estimation for Gaussian ARMAX and state space systems, minimum prediction error identification methods, nonstationary system identification, linear-quadratic stochastic control and concludes with a discussion of stochastic adaptive control. 1988 (0 471-08101-9) 874 pp. Introduction to the theory of Coverage Processes Peter Hall Coverage processes are finding increasing application in such diverse areas as queueing theory, ballistics, and physical chemistry. Drawing on methodology from several areas of probability theory and mathematics, this monograph provides a succinct and rigorous development of the mathematical theory of models for random coverage patterns. 1988 (0 471-85702-5) 408 pp.

Mathematical Statistics - Peter J. Bickel 2015-11-04

Mathematical Statistics: Basic Ideas and Selected Topics, Volume II presents important statistical concepts, methods, and tools not covered in the authors' previous volume. This second volume focuses on inference in non- and semiparametric models. It not only reexamines the procedures introduced in the first volume from a more sophisticated point of view but also addresses new problems originating from the analysis of estimation of functions and other complex decision procedures and large-scale data analysis. The book covers asymptotic efficiency in semiparametric models from the Le Cam and Fisherian points of view as well as some finite sample size optimality criteria based on Lehmann–Scheffé theory. It develops the theory of semiparametric maximum likelihood estimation with applications to areas such as survival analysis. It also discusses methods of inference based on sieve models and asymptotic testing theory. The remainder of the book is devoted to model and variable selection, Monte Carlo methods, nonparametric curve estimation, and prediction, classification, and machine learning topics. The necessary background material is included in an appendix. Using the tools and methods developed in this textbook, students will be ready for advanced research in modern statistics. Numerous examples illustrate statistical modeling and inference concepts while end-of-chapter problems reinforce elementary concepts and introduce important new topics. As in Volume I, measure theory is not required for understanding. The solutions to exercises for Volume II are included in the back of the book. Check out Volume I for fundamental, classical statistical concepts leading to the material in this volume.

Generalized Additive Models - Simon N. Wood 2006-02-27

Now in widespread use, generalized additive models (GAMs) have evolved into a standard statistical methodology of considerable flexibility. While Hastie and Tibshirani's outstanding 1990 research monograph on GAMs is largely responsible for this, there has been a long-standing need for an accessible introductory treatment of the subject that also e

Modeling and Analysis of Stochastic Systems, Second Edition - Vidyadhar G. Kulkarni 2009-12-18

Based on the author's more than 25 years of teaching experience, Modeling and Analysis of Stochastic Systems, Second Edition covers the most important classes of stochastic processes used in the modeling of diverse systems, from supply chains and inventory systems to genetics and biological systems. For each class of stochastic process, the text includes its definition, characterization, applications, transient and limiting behavior, first passage times, and cost/reward models. Along with reorganizing the material, this edition revises and adds new exercises and examples. New to the second edition: a new chapter on diffusion processes that gives an accessible and non-measure-theoretic treatment with applications to finance; a more streamlined, application-oriented approach to renewal, regenerative, and Markov regenerative processes; and, two appendices that collect relevant results from analysis and differential and difference equations. Rather than offer special tricks that work in specific problems, this book provides thorough coverage of general tools that enable the solution and analysis of stochastic models. After mastering the material in the text, students will be well-equipped to build and analyze useful stochastic models for various situations. A collection of MATLAB[registered]-based programs can be downloaded from the author's website and a solutions manual is available for qualifying instructors.

Introduction to Statistical Methods for Clinical Trials - Thomas D. Cook 2007-11-19

Clinical trials have become essential research tools for evaluating the benefits and risks of new interventions for the treatment and prevention of diseases, from cardiovascular disease to cancer to AIDS. Based on the authors' collective experiences in this field, Introduction to Statistical Methods for Clinical Trials presents various statistical topics relevant to the design, monitoring, and analysis of a clinical trial. After reviewing the history, ethics, protocol, and regulatory issues of clinical trials, the book provides guidelines for formulating primary and secondary questions and translating clinical questions into statistical ones. It examines designs used in clinical trials, presents methods for determining sample size, and introduces constrained randomization procedures. The authors also discuss how various types of data must be collected to answer key questions in a trial. In addition, they explore common analysis methods, describe statistical methods that determine what an emerging trend represents, and present issues that arise in the analysis of data. The book concludes with suggestions for reporting trial results that are consistent with universal guidelines recommended by medical journals. Developed from a course taught at the University of Wisconsin for the past 25 years, this textbook provides a solid understanding of the statistical approaches used in the design, conduct, and analysis of clinical trials.

Modelling Binary Data, Second Edition - David Collett 2002-09-25

Since the original publication of the bestselling Modelling Binary Data, a number of important methodological and computational developments have emerged, accompanied by the steady growth of statistical computing. Mixed models for binary data analysis and procedures that lead to an exact version of logistic regression form valuable additions to the statistician's toolbox, and author Dave Collett has fully updated his popular treatise to incorporate these important advances. Modelling Binary Data, Second Edition now provides an even more comprehensive and practical guide to statistical methods for analyzing binary data. Along with thorough revisions to the original material-now independent of any particular software package- it includes a new chapter introducing mixed models for binary data analysis and another on exact methods for modelling binary data. The author has also added material on modelling ordered categorical data and provides a summary of the leading software packages. All of the data sets used in the book are available for download from the Internet, and the appendices include additional data sets useful as exercises.

Simulation and the Monte Carlo Method - Reuven Y. Rubinstein 1981-05-14

This book provides the first simultaneous coverage of the statistical aspects of simulation and Monte Carlo methods, their commonalities and their differences for the solution of a wide spectrum of engineering and scientific problems. It contains standard material usually considered in Monte Carlo simulation as well as new material such as variance reduction techniques, regenerative simulation, and Monte Carlo optimization.

Time Series Analysis - Henrik Madsen 2007-11-28

With a focus on analyzing and modeling linear dynamic systems using statistical methods, Time Series Analysis formulates various linear models, discusses their theoretical characteristics, and explores the connections among stochastic dynamic models. Emphasizing the time domain description, the author presents theorems to highlight the most

Tools and Techniques for Social Science Simulation - Ramzi Suleiman 2012-12-06

The use of computer simulations to study social phenomena has grown rapidly during the last few years. Many social scientists from the fields of economics, sociology, psychology and other disciplines now use computer simulations to study a wide range of social phenomena. The availability of powerful personal computers, the development of multidisciplinary approaches and the use of artificial intelligence models have all contributed to this development. The benefits of using computer simulations in the social sciences are obvious. This holds true for the use of simulations as tools for theory building and for its implementation as a tool for sensitivity analysis and parameter optimization in application-oriented models. In both, simulation provides powerful tools for the study of complex social systems, especially for dynamic and multi-agent social systems in which mathematical tractability is often impossible. The graphical display of simulation output renders it user friendly to many social scientists that lack sufficient familiarity with the language of mathematics. The present volume aims to contribute in four directions: (1) To examine theoretical and methodological issues related to the application of simulations in the social sciences. By this we wish to promote the objective of designing a unified, user-friendly, simulation toolkit which could be applied to diverse social problems. While no claim is made that this objective has been met, the theoretical issues treated in Part 1 of this volume are a contribution towards this objective.