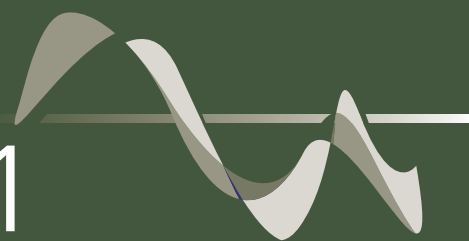


Vital Statistics 2010/11



New and forthcoming titles in Statistics and Probability

Highlights

New Series

Institute of Mathematical Statistics Textbooks & Institute of Mathematical Statistics Monographs

The Institute of Mathematical Statistics is an international scholarly and professional organization. Its extensive journals publishing program includes the top journals *Annals of Statistics* and *Annals of Probability*. IMS and Cambridge, both forward-looking organizations, have now joined to bring the same intellectual leadership to books publishing, building two series of immediate value and lasting impact in a fast-growing area central to modern science.



Probability on Graphs

Random Processes on Graphs and Lattices

Geoffrey Grimmett

University of Cambridge

Grimmett's concise and masterful introduction to the basic mathematical ideas needed to model such random processes as viral marketing, epidemics, random algorithms, and efficient routing. The selection of topics and the approach taken to them is strongly motivated by modern

applications. Each chapter ends with exciting exercises.

- Author renowned for his clear, readable style
- Probability theory sheds light on everything
- Engages your brain and lets you get your hands dirty

Preface; 1. Random walks on graphs; 2. Uniform spanning tree; 3. Percolation and self-avoiding walk; 4. Association and influence; 5. Further percolation; 6. Contact process; 7. Gibbs states; 8. Random-cluster model; 9. Quantum Ising model; 10. Interacting particle systems; 11. Random graphs; 12. Lorentz gas; References; Index.

Institute of Mathematical Statistics Textbooks, 1

2010 228 x 152 mm 260pp 45 b/w illus. 90 exercises
978-0-521-19798-4 Hardback £60.00
978-0-521-14735-4 Paperback £21.99



Large-Scale Inference

Empirical Bayes Methods for Estimation, Testing, and Prediction

Bradley Efron

Stanford University, California

Modern scientific technology (e.g. microarrays, fMRI machines) produces data in vast quantities. Bradley Efron explains the empirical Bayes methods that help make sense of a new statistical world. This is essential reading for

professional statisticians and graduate students wishing to use and understand important new techniques like false discovery rates.

- In-depth investigation helps statisticians understand complicated new methodology
- Takes the empirical Bayes approach, which combines Bayesian and frequentist viewpoints

- The author, inventor of the bootstrap, has published extensively on both large-scale inference and empirical Bayes methods

Introduction and foreword; 1. Empirical Bayes and the James-Stein estimator; 2. Large-scale hypothesis testing; 3. Significance testing algorithms; 4. False discovery rate control; 5. Local false discovery rates; 6. Theoretical, permutation and empirical null distributions; 7. Estimation accuracy; 8. Correlation questions; 9. Sets of cases (enrichment); 10. Combination, relevance, and comparability; 11. Prediction and effect size estimation; A. Exponential families; B. Programs and data sets; Bibliography; Index.

Institute of Mathematical Statistics Monographs, 1

2010 228 x 152 mm 276pp 65 b/w illus. 10 colour illus. 105 exercises
978-0-521-19249-1 Hardback £40.00

General Models and Methods



Bayesian Nonparametrics

Edited by Nils Lid Hjort

Universitetet i Oslo

Chris Holmes

University of Oxford

Peter Müller

University of Texas, M. D. Anderson Cancer Center

and Stephen G. Walker

University of Kent, Canterbury

Bayesian nonparametrics works. Applications are appearing in such disciplines as information retrieval, NLP, machine vision, computational biology, cognitive science, signal processing. In this coherent introduction, the editors weave together tutorial chapters by Ghosal, Lijoi and Prünster, Dunson, and Teh and Jordan, giving direct access to these exciting ideas and methods.

An invitation to Bayesian nonparametrics Nils Lid Hjort, Chris Holmes, Peter Müller and Stephen G. Walker; 1. Bayesian nonparametric methods: motivation and ideas Stephen G. Walker; 2. The Dirichlet process, related priors, and posterior asymptotics Subhashis Ghosal; 3. Models beyond the Dirichlet process Antonio Lijoi and Igor Prünster; 4. Further models and applications Nils Lid Hjort; 5. Hierarchical Bayesian nonparametric models with applications Yee Whye Teh and Michael I. Jordan; 6. Computational issues arising in Bayesian nonparametric hierarchical models Jim Griffin and Chris Holmes; 7. Nonparametric Bayes applications to biostatistics David B. Dunson; 8. More nonparametric Bayesian models for biostatistics Peter Müller and Fernando Quintana; Author index; Subject index.

Cambridge Series in Statistical and Probabilistic Mathematics, 28

2010 253 x 177 mm 308pp 24 b/w illus.
978-0-521-51346-3 Hardback £35.00



Bayesian Decision Analysis

Principles and Practice

Jim Q. Smith

University of Warwick

Real-world decisions involve numbers, but they also involve people. Bayesian decision analysis gives a principled framework for

reconciling the two. This textbook explains how to use statistical theory, psychology and algorithms to guide decision makers so that they can marshal available evidence and defend their actions.

Preface; Part I. Foundations of Decision Modeling: 1. Introduction; 2. Explanations of processes and trees; 3. Utilities and rewards; 4. Subjective probability and its elicitation; 5. Bayesian inference for decision analysis; Part II. Multi-Dimensional Decision Modeling: 6. Multiattribute utility theory; 7. Bayesian networks; 8. Graphs, decisions and causality; 9. Multidimensional learning; 10. Conclusions; Bibliography.

2010 247 x 174 mm 348pp 65 exercises
978-0-521-76454-4 Hardback £35.00



Data Analysis and Graphics Using R

An Example-Based Approach

Third edition

John Maindonald

Australian National University, Canberra

and W. John Braun

University of Western Ontario

'...a readable book that is rich with clear explanations and illustrative examples of the capability of a diverse set of tools. The packaging of the material with the R language is natural, and the extensive web pages of resources complement the book's usefulness for a broad audience of statisticians and practitioners.'
Biometrics

This third edition of the popular guide to using R reflects recent improvements to the R system, including major advances in graphical user interfaces and graphics packages. It emphasizes hands-on analysis, graphical display and interpretation of data. Ideal for researchers, students of applied statistics, and practising statisticians.

Cambridge Series in Statistical and Probabilistic Mathematics, 10

2010 247 x 174 mm 552pp 150 b/w illus. 12 colour illus.
40 tables
978-0-521-76293-9 Hardback £50.00



Negative Binomial Regression

Second edition

Joseph M. Hilbe

Arizona State University

'Every model currently offered in commercial statistical software is discussed in detail...well written and can

serve as an excellent reference book for applied statisticians who would use negative binomial regression modelling for undergraduate students or graduate students.'

Zentralblatt MATH

- Fully revised to incorporate recent software developments
- Every model currently offered in a commercial statistical software package is discussed in detail
- Data sets and additional code available on a companion website

Preface; 1. Introduction; 2. The concept of risk; 3. Overview of count response models; 4. Methods of estimation and assessment; 5. Assessment of count models; 6. Poisson regression; 7. Overdispersion; 8. Negative binomial regression; 9. Negative binomial regression: modeling; 10. Alternative variance parameterizations; 11. Problems with zero counts; 12. Censored and truncated count models; 13. Handling endogeneity and latent class models; 14. Count panel models; 15. Bayesian negative binomial models; Appendix A. Constructing and interpreting interactions; Appendix B. Data sets and Stata files; References; Index.

2011 228 x 152 mm 550pp 36 b/w illus. 170 tables
978-0-521-19815-8 Hardback c.£50.00



The Cambridge Dictionary of Statistics

Fourth edition

B. S. Everitt

King's College London

and A. Skrondal

Norwegian Institute of Public Health

Easy access to simple, reliable definitions and explanations of

modern statistical and statistics-related concepts. Over 3600 terms are defined, covering medical, survey, theoretical, and applied statistics, including computational aspects. Most definitions include a reference to an extended account of the term; many are accompanied by graphical material to aid understanding. This fourth edition includes new entries reflecting changes in the field, particularly a growing interest in Bayesian statistics and machine learning.

2010 247 x 174 mm 478pp 150 b/w illus.
978-0-521-76699-9 Hardback £40.00

New in Paperback



Essentials of Statistical Inference

G. A. Young

Imperial College of Science, Technology

and Medicine, London

and R. L. Smith

University of North Carolina, Chapel Hill

'This is a delightful book! It gives a well-written exposure

to inference issues in statistics, very suitable for a first-year graduate course ... The authors present the material in a very good pedagogical manner. The examples are excellent, and the exercises are very instructive ... very much up to date and includes recent developments in the field.'

MAA Reviews

- Very concise account of the fundamental core of statistical inference
- Gives a broad treatment of its subject, emphasizing both Bayesian and frequentist approaches
- Very modern account, emphasizing computational techniques as well as basic theory

1. Introduction; 2. Decision theory; 3. Bayesian methods; 4. Hypothesis testing; 5. Special models; 6. Sufficiency and completeness; 7. Two-sided tests and conditional inference; 8. Likelihood theory; 9. Higher-order theory; 10. Predictive inference; 11. Bootstrap methods.

Cambridge Series in Statistical and Probabilistic Mathematics, 16

2010 253 x 215 mm 236pp 92 exercises
978-0-521-54866-3 Paperback £19.99



Normal Approximation and Asymptotic Expansions

Rabi N. Bhattacharya

University of Arizona

and R. Ranga Rao

University of Illinois, Urbana-Champaign

An important book for statisticians due to both its

treatment of various refinements of the multivariate central limit theorem and its exposition of asymptotic expansions. It is appropriate for graduate students of statistics and probability, as well as researchers whose work involves the asymptotic theory of statistics.

Classics in Applied Mathematics, 64

2010 247 x 174 mm 332pp
978-0-89871-897-3 Paperback c.£46.00
Not for sale in North America

Probability



Probability Theory

An Analytic View

Second edition

Daniel W. Stroock

Massachusetts Institute of Technology

'... uniformly well written and well spiced with comments to aid the intuition, so the readership should include a

wide range, both of students and of professional probabilists. ... We can expect it to take its place alongside the classics of probability theory.'

Mathematical Reviews

Second edition of Daniel W. Stroock's classic probability theory textbook, suitable for first-year graduate students with a good grasp of introductory, undergraduate probability.

1. Sums of independent random variables; 2. The central limit theorem; 3. Infinitely divisible laws; 4. Levy processes; 5. Conditioning and martingales; 6. Some extensions and applications of martingale theory; 7. Continuous parameter martingales; 8. Gaussian measures on a Banach space; 9. Convergence of measures on a Polish space; 10. Wiener measure and partial differential equations; 11. Some classical potential theory.

2011 253 x 215 mm 536pp 768 exercises
978-0-521-76158-1 Hardback c.£60.00
978-0-521-13250-3 Paperback c.£30.00



Probability

Theory and Examples

Fourth edition

Rick Durrett

Duke University, North Carolina

This classic introduction to probability theory for beginning graduate students is a comprehensive treatment

concentrating on the results most useful for applications.

- More than 250 good examples and 500 exercises
- Comprehensive treatment in only 400 pages
- Concentrates on results useful for application

1. Measure theory; 2. Laws of large numbers; 3. Central limit theorems; 4. Random walks; 5. Martingales; 6. Markov chains; 7. Ergodic theorems; 8. Brownian motion; Appendix A. Measure theory details.

Cambridge Series in Statistical and Probabilistic Mathematics

2010 253 x 215 mm 448pp 23 b/w illus. 532 exercises
978-0-521-76539-8 Hardback £45.00

New in Paperback



Random Graph Dynamics

Rick Durrett

Duke University, North Carolina

'A very valuable addition to the growing field of random graphs, providing a systematic coverage of these novel models.'

Michael Krivelevich, Mathematical Reviews

'The book is written in a friendly, chatty style, making it easy to read; I very much like that. In summary, Random Graph Dynamics is a nice contribution to the area of random graphs and a source of valuable insights.'

Malwina J. Luczak, Journal of the American Statistical Association

1. Overview; 2. Erdos-Renyi random graphs; 3. Fixed degree distributions; 4. Power laws; 5. Small worlds; 6. Random walks; 7. CHKNS model.

Cambridge Series in Statistical and Probabilistic Mathematics, 20

2010 253 x 215 mm 220pp
978-0-521-15016-3 Paperback £19.99



Probability and Mathematical Genetics

Papers in Honour of Sir John Kingman

Edited by N. H. Bingham

Imperial College, London

and C. M. Goldie

University of Sussex

Focussing on the work of Sir John

Kingman, one of the world's leading researchers in probability and mathematical genetics, this book touches on the important areas of these subjects in the last 50 years. No leading university department of mathematics or statistics, or library, can afford to be without this unique text. Leading authorities give a unique insight into a wide range of currently topical problems, from the mathematics of road networks to the genomics of cancer.

- Sir John Kingman gives a first-hand account of developments in the 1960s
- A state-of-the-art treatment of mathematical genetics, relevant to genomic research
- Distinguished authors include 11 Fellows of the Royal Society

Contributors: J. F. C. Kingman, David J. Aldous, G. K. Ambler, B. W. Silverman, A. D. Barbour, S. Tavaré, J. D. Biggins, N. H. Bingham, A. J. Ostaszewski, D. J. Daley, Aurore Delaigle, Peter Hall, Peter Donnelly, Stephen Leslie, Warren J. Ewens, Geoffrey A. Watterson, Alexander Gnedin, Chris Haulk, Jim Pitman, C. M. Goldie, R. Cornish, C. L. Robinson, Peter J. Green, D. R. Grey, R. C. Griffiths, D. Spanó, Geoffrey Grimmett, P. H. Haynes, V. H. Hoang, J. R. Norris, K. C. Zygalakis, F. P. Kelly, R. J. Williams, W. S. Kendall, V. Shcherbakov, S. Volkov, P. Whittle, David Williams

London Mathematical Society Lecture Note Series, 378

2010 228 x 152 mm 546pp 30 b/w illus. 10 tables
978-0-521-14577-0 Paperback £50.00



Nonlinear Markov Processes and Kinetic Equations

Vassili N. Kolokoltsov

University of Warwick

The first book devoted to the theory of nonlinear Markov processes provides a careful exposition of both probabilistic and

analytic techniques. The author uses probability to obtain deeper insight into nonlinear dynamics, and analysis to tackle difficult problems in the description of random and chaotic behaviour.

Cambridge Tracts in Mathematics, 182

2010 228 x 152 mm 394pp 45 exercises
978-0-521-11184-3 Hardback £45.00



Random Walk: A Modern Introduction

Gregory F. Lawler

University of Chicago

and Vlada Limic

Université de Provence

An advanced treatment of random walks written for students and researchers in probability and related fields.

- Suitable for researchers from a variety of fields who use random walks in modeling
- Extensive bibliography assists further reading
- Contains over 80 exercises

Cambridge Studies in Advanced Mathematics, 123

2010 228 x 152 mm 376pp 7 b/w illus. 85 exercises
978-0-521-51918-2 Hardback £45.00

New in Paperback



The Geometry of Random Fields

Robert J. Adler

Technion - Israel Institute of Technology, Haifa

An important exposition of the geometric properties of sets generated by random fields.

- Self-contained classic text on the theory of smooth and non-smooth random fields
- Accessible to readers who are specialists in neither probability nor geometry
- Covers both smooth and non-smooth fields, whereas other books on the subject tend to treat only one of the two scenarios

2010 247 x 174 mm 184pp
978-0-89871-693-1 Paperback £55.00
Not for sale in North America

Statistics for Physical Sciences and Engineering



Sparse Image and Signal Processing

Wavelets, Curvelets, Morphological Diversity
Jean-Luc Starck
Centre d'Etudes de Saclay, France
Fionn Murtagh

Royal Holloway, University of London
and Jalal M. Fadili
Ecole Nationale Supérieure d'Ingénieurs de Caen, France

This book presents the state of the art in sparse and multiscale image and signal processing, covering linear multiscale transforms, such as wavelet, ridgelet, or curvelet transforms, and non-linear multiscale transforms based on the median and mathematical morphology operators.

1. Introduction to the world of sparsity; 2. The wavelet transform; 3. Redundant wavelet transform; 4. Nonlinear multiscale transforms; 5. The ridgelet and curvelet transforms; 6. Sparsity and noise removal; 7. Linear inverse problems; 8. Morphological diversity; 9. Sparse blind source separation; 10. Multiscale geometric analysis on the sphere; 11. Compressed sensing.

2010 253 x 215 mm 336pp 110 b/w illus. 6 tables
978-0-521-11913-9 Hardback £50.00

New in Paperback



Bayesian Logical Data Analysis for the Physical Sciences

A Comparative Approach with Mathematica® Support
Phil Gregory

University of British Columbia, Vancouver

'As well as the usual topics to be found in a text on Bayesian inference, chapters are included on frequentist inference (for contrast), non-linear model fitting, spectral analysis and Poisson sampling.'

Zentralblatt MATH

Preface; Acknowledgements; 1. Role of probability theory in science; 2. Probability theory as extended logic; 3. The how-to of Bayesian inference; 4. Assigning probabilities; 5. Frequentist statistical inference; 6. What is a statistic?; 7. Frequentist hypothesis testing; 8. Maximum entropy probabilities; 9. Bayesian inference (Gaussian errors); 10. Linear model fitting (Gaussian errors); 11. Nonlinear model fitting; 12. Markov Chain Monte Carlo; 13. Bayesian spectral analysis; 14. Bayesian inference (Poisson sampling); Appendix A. Singular value decomposition; Appendix B. Discrete Fourier transforms; Appendix C. Difference in two samples; Appendix D. Poisson ON/OFF details; Appendix E. Multivariate Gaussian from maximum entropy; References; Index.

2010 247 x 174 mm 486pp 132 b/w illus. 74 exercises
978-0-521-15012-5 Paperback £35.00



Stochastic Scheduling

Expectation-Variance Analysis of a Schedule

Subhash C. Sarin

Virginia Polytechnic Institute and State University

Balaji Nagarajan and Lingrui Liao

In a stochastic environment, in which the processing time of a job

is not known with certainty, a schedule is typically analyzed based on the expected value of a performance measure. This book presents algorithms to determine the variability of a schedule under various machine configurations and objective functions.

1. Introduction; 2. Robust scheduling approaches to hedge against processing time uncertainty; 3. Expectation-variance analysis in stochastic multi-objective scheduling; 4. Single machine models; 5. Flow shop models; 6. Job shop models; 7. The case of general processing time distribution; 8. Concluding remarks.

2010 253 x 215 mm 208pp 30 b/w illus. 43 tables
978-0-521-51851-2 Hardback £45.00



Boolean Models and Methods in Mathematics, Computer Science, and Engineering

Edited by **Yves Crama**

Université de Liège, Belgium
and Peter L. Hammer

This collection of papers presents a series of in-depth examinations on a variety of advanced topics related to Boolean functions and expressions. The chapters are written by some of the most prominent experts in their respective fields and cover topics ranging from algebra and propositional logic to learning theory, cryptography, computational complexity, electrical engineering, and reliability theory.

Encyclopedia of Mathematics and its Applications, 134

2010 234 x 156 mm 780pp 91 b/w illus. 7 tables
978-0-521-84752-0 Hardback £110.00



Digital Nets and Sequences

Discrepancy Theory and Quasi-Monte Carlo Integration

Josef Dick

University of New South Wales, Sydney

and Friedrich Pillichshammer

Johannes Kepler Universität Linz

An introduction to contemporary quasi-Monte Carlo methods,

digital nets and sequences, and discrepancy theory. Includes many exercises, examples and illustrations.

Preface; Notation; 1. Introduction; 2. Quasi-Monte Carlo integration, discrepancy and reproducing kernel Hilbert spaces; 3. Geometric discrepancy; 4. Nets and sequences; 5. Discrepancy estimates and average type results; 6. Connections to other discrete objects; 7. Duality Theory; 8. Special constructions of digital nets and sequences; 9. Propagation rules for digital nets; 10. Polynomial lattice point sets; 11. Cyclic digital nets and hyperplane nets; 12. Multivariate integration in weighted Sobolev spaces; 13. Randomisation of digital nets; 14. The decay of the Walsh coefficients of smooth functions; 15. Arbitrarily high order of convergence of the worst-case error; 16. Explicit constructions of point sets with best possible order of L2-discrepancy; Appendix A. Walsh functions; Appendix B. Algebraic function fields; References; Index.

2010 247 x 174 mm 618pp 45 b/w illus. 260 exercises
978-0-521-19159-3 Hardback £52.00



Networks, Crowds, and Markets

Reasoning About a Highly Connected World

David Easley

Cornell University, New York

and Jon Kleinberg

Cornell University, New York

'In this remarkable book, Jon Kleinberg and David Easley bring all the tools of computer science, economics, and sociology to bear on one of the great scientific challenges of our time: understanding the structure, function, and dynamics of networks in society. Clearly written and covering an impressive range of topics, Networks, Crowds, and Markets is the ideal starting point for any student aspiring to learn the fundamentals of the emerging field of network science.'

Duncan Watts, author of *Six Degrees: The Science of a Connected Age*

1. Overview; Part I. Graph Theory and Social Networks: 2. Graphs; 3. Strong and weak ties; 4. Networks in their surrounding contexts; 5. Positive and negative relationships; Part II. Game Theory: 6. Games; 7. Evolutionary game theory; 8. Modeling network traffic using game theory; 9. Auctions; Part III. Markets and Strategic Interaction in Networks: 10. Matching markets; 11. Network models of markets with intermediaries; 12. Bargaining and power in networks; Part IV. Information Networks and the World Wide Web: 13. The structure of the Web; 14. Link analysis and Web search; 15. Sponsored search markets; Part V. Network Dynamics: Population Models: 16. Information cascades; 17. Network effects; 18. Power laws and rich-get-richer phenomena; Part VI. Network Dynamics: Structural Models: 19. Cascading behavior in networks; 20. The small-world phenomenon; 21. Epidemics; Part VII. Institutions and Aggregate Behavior: 22. Markets and information; 23. Voting; 24. Property.

2010 253 x 215 mm 744pp 332 b/w illus. 128 exercises
978-0-521-19533-1 Hardback £30.00



Probability, Random Processes, and Statistical Analysis

Applications to Communications, Signal Processing, Queueing Theory and Mathematical Finance
Hisashi Kobayashi

Princeton University, New Jersey

Brian L. Mark

George Mason University, Virginia

and William Turin

AT&T Bell Laboratories, New Jersey

Covers the fundamental topics together with advanced theories, including the EM algorithm, hidden Markov models, and queueing and loss systems.

1. Introduction; 2. Probability; 3. Discrete random variables; 4. Continuous random variables; 5. Functions of random variables and their distributions; 6. Fundamentals of statistical analysis; 7. Distributions derived from the normal distribution; 8. Moment generating function and characteristic function; 9. Generating function and Laplace transform; 10. Inequalities, bounds and large deviation approximation; 11. Convergence of a sequence of random variables; 12. Random process and spectral analysis; 13. Statistical estimation and decision theory; 14. Markov process and semi-Markov process; 15. Point process, renewal process and birth-and-death process; 16. Random walk, Brownian motion and diffusion process; 17. Filtering and prediction of random processes; 18. Queueing and loss models; 19. Hidden Markov models and applications; Appendices.

2011 247 x 174 mm 700pp 150 b/w illus. 19 tables
978-0-521-89544-6 Hardback c.£45.00



Fundamentals of Object Tracking

Subhash Challa

University of Melbourne

Mark R. Morelande

University of Melbourne

Darko Mušicki

Hanyang University, Republic of Korea

and Robin J. Evans

University of Melbourne

In recent years there have been major advances in the use of object tracking technology for both military and civilian applications. This book provides a solid foundation to this field and its methods for the growing number of students, engineers and researchers working on real-world tracking problems.

2011 247 x 174 mm 364pp 60 b/w illus. 1 colour illus.
978-0-521-87628-5 Hardback c.£55.00



A Student's Guide to Data and Error Analysis

Herman J. C. Berendsen

University of Groningen, Netherlands

A concise, readable guide to data handling and error analysis, this book provides practical guidelines, computer programs (in Python), and recipes for the proper handling and presentation of scientific data and their inaccuracies.

- A concise guide to bring students up-to-speed quickly
- Provides the essential equations and methods that students need to handle and present scientific data
- Includes data sets, units and additional background information in the appendices

Part I. Data and Error Analysis: 1. Introduction; 2. The presentation of physical quantities with their inaccuracies; 3. Errors: classification and propagation; 4. Probability distributions; 5. Processing of experimental data; 6. Graphical handling of data with errors; 7. Fitting functions to data; 8. Back to Bayes: knowledge as a probability distribution; Answers to exercises; Part II. Appendices: A1. Combining uncertainties; A2. Systematic deviations due to random errors; A3. Characteristic function; A4. From binomial to normal distributions; A5. Central limit theorem; A6. Estimation of the variance; A7. Standard deviation of the mean; A8. Weight factors when variances are not equal; A11. Least squares fitting; Part III. Python codes; Part IV. Scientific data: Chi-squared distribution; F-distribution; Normal distribution; Physical constants; Probability distributions; Student's t-distribution; Units.

2011 228 x 152 mm 230pp 47 b/w illus. 12 tables
49 exercises
978-0-521-11940-5 Hardback c.£40.00
978-0-521-13492-7 Paperback c.£14.99

Biostatistics

Textbook



Applied Linear Models with SAS

Daniel Zelterman

Yale University, Connecticut

This textbook for a second course in basic statistics for undergraduates or first-year graduate students introduces linear regression models and describes other linear models. Numerous examples drawn from current events with an emphasis on health issues illustrate these concepts. Assuming only a pre-calculus background, the author keeps equations to a minimum and demonstrates all computations using SAS.

1. Introduction; 2. Principles of statistics; 3. Introduction to linear regression; 4. Assessing the regression; 5. Multiple linear regression; 6. Indicators, interactions, and transformations; 7. Nonparametric statistics; 8. Logistic regression; 9. Diagnostics for logistic regression; 10. Poisson regression; 11. Survival analysis; 12. Proportional hazards regression; 13. Review of methods; Appendix: statistical tables.

2010 253 x 215 mm 288pp 69 b/w illus. 104 tables
118 exercises
978-0-521-76159-8 Hardback £45.00



Statistical Learning for Biomedical Data

James D. Malley

National Institutes of Health, Washington D.C.

Karen G. Malley

Malley Research Programming, Rockville, MD

and Sinisa Pajevic

National Institutes of Health, Washington D.C.

Biomedical researchers need machine learning techniques to make predictions such as survival/death or response to treatment when data sets are large and complex. This highly motivating introduction to these machines explains underlying principles in nontechnical language, using many examples and figures, and connects these new methods to familiar techniques.

Preface; Acknowledgements; Part I. Introduction: 1. Prologue; 2. The landscape of learning machines; 3. A mangle of machines; 4. Three examples and several machines; Part II. A Machine Toolkit: 5. Logistic regression; 6. A single decision tree; 7. Random forests – trees everywhere; Part III. Analysis Fundamentals: 8. Merely two variables; 9. More than two variables; 10. Resampling methods; 11. Error analysis and model validation; Part IV. Machine Strategies: 12. Ensemble methods – let's take a vote; 13. Summary and conclusions; References; Index.

Practical Guides to Biostatistics and Epidemiology

2011 247 x 174 mm 312pp 45 b/w illus. 25 tables
978-0-521-87580-6 Hardback c.£65.00
978-0-521-69909-9 Paperback c.£28.99



Phylogenetic Networks

Concepts, Algorithms and Applications

Daniel H. Huson

Eberhard-Karls-Universität Tübingen, Germany

Regula Rupp

Eberhard-Karls-Universität Tübingen, Germany

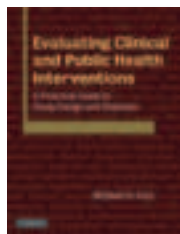
and Celine Scornavacca

Eberhard-Karls-Universität Tübingen, Germany

First interdisciplinary overview of phylogenetic networks, covering biological background, the underlying mathematics, the computational algorithms and the software available.

Part I. Introduction: 1. Basics; 2. Sequence alignment; 3. Phylogenetic trees; 4. Phylogenetic networks; Part II. Theory: 5. Clusters and rooted phylogenetic networks; 6. Splits and unrooted phylogenetic networks; Part III. Algorithms and Applications: 7. Phylogenetic networks from clusters; 8. Phylogenetic networks from splits; 9. Phylogenetic networks from sequences; 10. Phylogenetic networks from distances; 11. Phylogenetic networks from trees; 12. Phylogenetic networks from triplets or quartets; 13. Drawing phylogenetic networks; 14. Software; Glossary; Index.

2010 247 x 174 mm 384pp 189 b/w illus. 80 exercises
978-0-521-75596-2 Hardback c.£35.00



Evaluating Clinical and Public Health Interventions

A Practical Guide to Study Design and Statistics

Mitchell H. Katz

University of California, San Francisco

This book teaches researchers how to evaluate health

interventions and simplifies the process of analyzing data.

- Structured in a question and answer format so that readers can navigate the coverage easily and focus on issues of specific interest to them
- Uses plain language rather than mathematical formulae
- Includes marginal notes of research tips and definitions to complement the main text

2010 246 x 189 mm 176pp 29 b/w illus. 56 tables
978-0-521-51488-0 Hardback £60.00
978-0-521-73559-9 Paperback £29.99



Multivariable Analysis

A Practical Guide for Clinical and Public Health Researchers

Third edition

Mitchell H. Katz

University of California, San Francisco

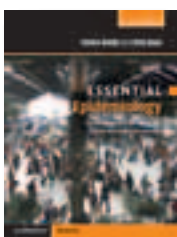
The third edition of this highly successful text enables clinical

researchers to set up, perform and interpret multivariable models.

- Marginal notes are included with research tips and definitions to help reinforce the key messages
- Presents a practical, non-mathematical approach so the book is accessible to a wide audience
- Illustrated throughout with up-to-date examples from the medical literature, tables and graphs to help simplify the process of performing multivariable analysis

2011 246 x 189 mm 250pp 30 b/w illus. 40 tables
978-0-521-76098-0 Hardback c.£64.00
978-0-521-14107-9 Paperback c.£32.00

Textbook



Essential Epidemiology

An Introduction for Students and Health Professionals

Second edition

Penny Webb

Queensland Institute of Medical Research

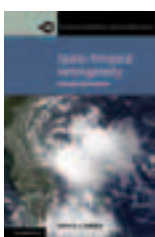
and Christopher Bain

University of Queensland

'In this book, the authors have succinctly outlined the key concepts in modern epidemiology. ... the way forward is to 'think smarter' - this book provides the ideal starting point for those wanting to do just that.'
International Journal of Epidemiology

1. Epidemiology is ...; 2. How long is a piece of string? Measuring disease frequency; 3. Who, what, where and when? Descriptive epidemiology; 4. Healthy research: study designs for public health; 5. Why? Linking exposure and disease; 6. Heads or tails?: The role of chance; 7. All that glitters is not gold: the problem of error; 8. Muddled waters: the challenge of confounding; 9. Reading between the lines: reading and writing epidemiological papers; 10. Who sank the boat? Association and causation; 11. Assembling the building blocks: reviews and their uses; 12. Outbreaks, epidemics and clusters; 13. Watching not waiting: surveillance and epidemiological intelligence; 14. Prevention: better than cure?; 15. Early detection: what benefits at what cost?; 16. A final word ...; Answers to questions; Appendix 1. Direct standardisation; Appendix 2. Standard populations; Appendix 3. Calculating cumulative incidence and lifetime risk from routine data; Appendix 4. Indirect standardisation; Appendix 5. Calculating life expectancy from a life table; Appendix 6. The Mantel-Haenszel method for calculating pooled odds ratios; Appendix 7. Formulae for calculating confidence intervals for common epidemiological measures; Index.

2010 246 x 189 mm 432pp 78 colour illus. 62 tables
978-0-521-17731-3 Paperback c.£27.99



Spatio-Temporal Heterogeneity

Concepts and Analyses

Pierre R. L. Dutilleul

'... has a friendly style, includes pertinent examples as well as explanations and motivations ... I know of no other book quite like it. I

recommend the book highly to students, teachers and researchers in fields including biology, ecology and environmental science as well as in mainstream and applied statistics.'

David Brillinger, University of California, Berkeley

Foreword; Preface; 1. Conceptual introduction; 2. Spatio-temporal stochastic processes: definitions and properties; 3. Heterogeneity analysis of spatial point patterns; 4. Heterogeneity analysis of temporal and spatio-temporal point patterns; 5. Heterogeneity analysis of point patterns: process modeling and summary; 6. Heterogeneity analysis of time series; 7. Heterogeneity analysis of spatial surface patterns; 8. Heterogeneity analysis of spatio-temporal surface patterns; 9. Sampling and study design aspects in heterogeneity analysis of surface patterns; 10. Conclusions; Index.

Ecology, Biodiversity and Conservation

2011 228 x 152 mm 416pp 93 b/w illus. 26 tables
978-0-521-79127-4 Hardback c.£75.00
978-1-107-40035-1 Paperback c.£35.00

Statistics for Social Science, Economics and Finance

Collecting, Managing, and Assessing Data Using Sample Surveys

Peter Stophor

University of Sydney

Requiring no prior knowledge of statistics or surveys, this book provides a thorough, step-by-step guide to the design and implementation of surveys. It is an excellent introduction to the use of surveys for graduate students as well as a useful reference work for scholars and professionals.

List of figures; List of tables; 1. Introduction; 2. Basic statistics and probability; 3. Basic issues in surveys; 4. Ethics of surveys of human populations; 5. Design a survey; 6. Methods for conducting surveys of human populations; 7. Focus groups; 8. Design of survey instruments; 9. Design of questions and question wording; 10. Special issues for qualitative and preference surveys; 11. Design of data collection procedures; 12. Pilot surveys and pretests; 13. Sample design and sampling; 14. Repetitive surveys; 15. Survey economics; 16. Survey implementation; 17. Web-based surveys; 18. Coding and data entry; 19. Data expansion and weighting; 20. Nonresponse; 21. Measuring data quality; 22. Future directions in survey procedures; 23. Documenting and archiving; References; Index.

2011 247 x 174 mm 650pp 82 b/w illus. 70 tables
978-0-521-86311-7 Hardback c.£60.00
978-0-521-68187-2 Paperback c.£30.00



The Essential Guide to Effect Sizes

Statistical Power, Meta-Analysis, and the Interpretation of Research Results

Paul D. Ellis

Hong Kong Polytechnic University

'Paul Ellis writes with a light touch, explains well, and uses

numerous practical examples. He focuses on four of the issues that are central to the statistical changes now sweeping many disciplines - effect sizes, confidence intervals, power, and meta-analysis. This is a highly readable, highly practical book. It will be invaluable to anyone who wishes to contribute to - or even just understand - the research of the future.'

Geoff Cumming, La Trobe University, Australia

2010 247 x 174 mm 192pp 9 b/w illus. 20 tables
978-0-521-19423-5 Hardback £55.00
978-0-521-14246-5 Paperback £18.99

New in Paperback

Insurance Risk and Ruin

David C. M. Dickson
University of Melbourne

'... a nice introduction to some basic aspects of risk theory, with special emphasis on utility theory, recursive methods and ruin theory ... What I appreciate most is the

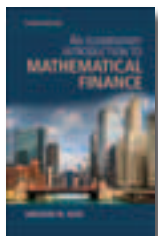
way in which the author explains the different topics dealt with in this book.'

ISI Short Book Reviews

Preface; 1. Probability distributions and insurance applications; 2. Utility theory; 3. Principles of premium calculation; 4. The collective risk model; 5. The individual risk model; 6. Introduction to ruin theory; 7. Classical ruin theory; 8. Advanced ruin theory; 9. Reinsurance; References; Solutions to exercises; Index.

International Series on Actuarial Science

2010 228 x 152 mm 242pp 50 b/w illus. 15 tables
75 exercises
978-0-521-17675-0 Paperback £30.00

Textbook

An Elementary Introduction to Mathematical Finance

Third edition
Sheldon M. Ross
University of Southern California

'... an excellent introduction to the subject ... the book is ideally suited for self-study

and provides a very accessible entry point to this fascinating field.'

ISI Short Book Reviews

Among the many new features of this third edition are new chapters on Brownian motion and geometric Brownian motion, stochastic order relations and stochastic dynamic programming, along with expanded sets of exercises and references for all the chapters.

1. Probability; 2. Normal random variables; 3. Geometric Brownian motion; 4. Interest rates and present value analysis; 5. Pricing contracts via arbitrage; 6. The Arbitrage Theorem; 7. The Black–Scholes formula; 8. Additional results on options; 9. Valuing by expected utility; 10. Stochastic order relations; 11. Optimization models; 12. Stochastic dynamic programming; 13. Exotic options; 14. Beyond geometric motion models; 15. Autoregressive models and mean reversion.

2011 228 x 152 mm 328pp 19 b/w illus. 9 tables
175 exercises
978-0-521-19253-8 Hardback c.£37.50


Economic Foundations of Symmetric Programming

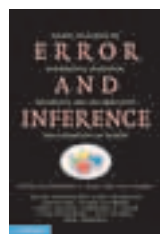
Quirino Paris
University of California, Davis

This book on symmetric programming is for graduate students who have already taken a graduate course in

microeconomic theory.

- Introduces novel specification called the equilibrium problem that does not require constraining/reductionist (and unrealistic) assumptions
- All economic problems analyzed are cast in the unifying framework of the linear complementarity problem
- Many numerical examples are provided to illustrate the various models along with command files for GAMS (the commercial computing application)

2010 228 x 152 mm 568pp 33 b/w illus. 27 tables
978-0-521-19472-3 Hardback £80.00
978-0-521-12302-0 Paperback £35.00

New in Paperback

Error and Inference

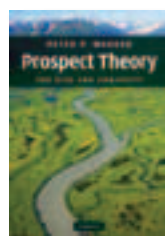
Recent Exchanges on Experimental Reasoning, Reliability, and the Objectivity and Rationality of Science
Edited by Deborah G. Mayo

Virginia Polytechnic Institute and State University
and Aris Spanos
Virginia Polytechnic Institute and State University

'Mayo and Spanos's collection has injected new ideas into the study of scientific inference ... a welcome bridge between current philosophy of science and scientific practice, providing the reader with new insights on important topics such as statistical inference, reliability, theory testing, causal modeling, and the relation between theory and experiment. The book will have a wide and enthusiastic readership among philosophers and scientists.'

Cristina Bicchieri, University of Pennsylvania

2010 228 x 152 mm 438pp 12 b/w illus. 4 tables
978-0-521-18025-2 Paperback £22.99


Prospect Theory

For Risk and Ambiguity
Peter P. Wakker

Erasmus Universiteit Rotterdam

'Peter Wakker's new book provides a brilliant account of what has happened in the field of decision theory during the last twenty years.

Decision analysts will find here many tools and assessment techniques that will enlarge their usual bag of tricks ... it will help to reduce the gap between the models developed by decision theorists and the ones used in practice by most decision analysts. Every serious decision analyst should have a copy of this book at hand.'

Denis Bouyssou, CNRS and Université Paris-Dauphine

2010 247 x 174 mm 520pp 106 b/w illus. 57 tables
187 exercises
978-0-521-76501-5 Hardback £70.00
978-0-521-74868-1 Paperback £29.99


Quantitative Risk Assessment

The Scientific Platform
Terje Aven

Universitet i Stavanger, Norway

Quantitative risk assessments cannot eliminate risk, but they can guide principled risk management. This book provides

a scientific framework for evaluating the quality of risk assessments and whether they are fit for purpose. For professionals, as well as graduate students and researchers. Includes examples throughout, and three extended case studies.

2011 247 x 174 mm 216pp 35 b/w illus.
978-0-521-76057-7 Hardback c.£35.00

Also of Interest

NIST Handbook of Mathematical Functions

Edited by Frank W. J. Olver

University of Maryland and National Institute of Standards and Technology, Maryland

Daniel W. Lozier

National Institute of Standards and Technology, Maryland

Ronald F. Boisvert

National Institute of Standards and Technology, Maryland

and Charles W. Clark

National Institute of Standards and Technology, Maryland and University of Maryland

'The NIST Handbook is indeed a monumental achievement, and the many, many individuals who participated in its creation and dissemination are to be congratulated and thanked.'

SIAM News

This new standard reference on mathematical functions replaces the classic but long-outdated handbook from Abramowitz and Stegun. Meticulously validated by an international team of experts, and in full colour, it comes from a 10-year project run by the National Institute of Standards and Technology. Includes searchable PDF version on CD.

2010 279 x 215 mm 968pp 422 colour illus. 100 tables
978-0-521-19225-5 Hardback £65.00
978-0-521-14063-8 Paperback £35.00

Please order from your local bookseller:

Journals



Combinatorics, Probability and Computing
journals.cambridge.org/CPC



Probability in the Engineering and Informational Sciences
journals.cambridge.org/PES



Epidemiology and Infection
journals.cambridge.org/HYG



Econometric Theory
journals.cambridge.org/ECT