REVIEWS


Contents:
1. What is probability?
2. Lotteries
3. Football Pools, Premium Bonds
4. One coin, many games
5. Dice
6. Games with few choices
7. Waiting, waiting, waiting
8. Let's play best of three
9. TV games
10. Casino games
11. Bookies, the Tote, spread betting
12. This sporting life
13. Lucky for some – miscellanea
14. Probability for lawyers

APPENDIX I: Counting
APPENDIX II: Probability
APPENDIX III: Averages and Variability
APPENDIX IV: Goodness-of-fit Tests
APPENDIX V: The Kelly Strategy

Readership: General

This is the second edition of the book that was originally published in 1999 [Short Book Reviews, Vol. 19, p. 4]. Similar to the first edition, the book is a gambling or games manual that uses probability arguments to obtain good strategies of play. Several chapters have been up-dated since the first edition, many remain essentially the same as before, and a new chapter has been added. As well, there are appendices that contain the mathematical detail necessary to the probability and statistical methods used within the text. The book remains a good read and is truly a modern-day Hoyle in the original sense of Hoyle's books. Most of those who have emulated Hoyle merely provide the rules of play. Hoyle's original Short Treatise on the Game of Whist from the eighteenth century contains, in addition to the rules, some strategies of play for that game based on the theory of probability. The current book is written in that same spirit. For teachers, the book contains a wealth of examples that could be used in the classroom to illustrate elementary probability theory. The only drawback to the new edition is that the new chapter, "Probability for lawyers", although interesting and informative, does not seem to fit into the same spirit of the first edition unless one considers taking a case before the bar as a kind of game to be played.

University of Western Ontario
London, Canada
D.R. Bellhouse


Contents:
1. Some mathematical foundations of music
2. Exploratory data mining in musical spaces
3. Global measures of structure and randomness
4. Time series analysis
5. Hierarchical methods
6. Markov chains and hidden Markov models
7. Circular statistics
8. Principal component analysis
9. Discriminant analysis
10. Cluster analysis
11. Multidimensional scaling

Readership: Those with a serious interest in the quantitative analysis of music who could cope with the material of two university years of mathematics and statistics

This earnest book presents a survey of statistical methods that can be applied to music. It is complete: beginning with the definition of groups on page 7 and related theorems beginning on page 10. By page 26, medians are defined proceeding through to wavelets. Readers should not be deterred by the completeness. Much can be learned without spending time on the mathematics. The introduction of a large number of basic and advanced statistical methods is well illustrated with graphical displays based on musical scores and performances. The selection of the music and the methods is quite broad and interestingly eclectic. The author's evident enthusiasm for the subject matter makes the reading most pleasurable. This book will be useful in expanding the methodology applied in the field.

University of Toronto
Toronto, Canada
D.F. Andrews


Contents:

PART I: Genotype-by-Environment Interaction and Stability Analysis
1. Genotype-by-environment interaction
2. Stability analyses in plant breeding and performance trials

PART II: GGE Biplot and Multi-Environment Trial Data Analysis
Readership: Students of statistics who need this familiar

Contents:
3. Theory of biplot
4. Introduction to GGE biplot
5. Biplot analysis of multi-environment trial data

PART III: GGE Biplot Software and Applications to Other Types of Two-Way Data
6. GGE biplot software – The solution for GGE biplot analyses
7. Cultivar evaluation based on multiple traits
8. QTL identification using GGE biplot
9. Biplot analysis of diallel data
10. Biplot analysis of host genotype-by-pathogen strain interactions
11. Biplot analysis to detect synergism between genotypes of different species

Readership: Plant and animal breeders, geneticists, agronomists, and statisticians interested in applications in these fields

A GGE biplot is a graphical display of principal components associated with Genotype main effects (G) and Genotype-by-Environment interactions (GE). Its aim is to facilitate the comparison of different genetic strains in different environments. The book describes the GGE methodology, promotes the authors' software program that carries out such calculations, and provides an impressive collection of examples of data analysis in breeding experiments.

The methodology is statistically straightforward and can be used with any two-way data. The authors' contribution has been to make the basics of multivariate analysis more palatable to plant and animal breeders. The methodology seems to have been well received by these users. The writing style is very clear, but this reviewer found the authors' occasional self-congratulatory outbursts to be unbecoming in a textbook.

Potential buyers need to know that the book is literally a companion to the software marketed by the authors via their website. Though most statisticians could carry out such analyses using software they already have, non-statisticians will be at a loss unless they purchase the software as well as the book. Statisticians will be interested to see how simple statistical ideas, such as main effects and interactions, can help illuminate the many trade-offs that are involved in breeding decisions.

Brookfield, U.S.A. C.A. Fung

TEACHING STATISTICS USING BASEBALL,

Contents:
1. An introduction to baseball statistics
2. Exploring a single batch of baseball data
3. Comparing batches and standardization
4. Relationships between measurement variables
5. Introduction to probability using tabletop games
6. Probability distributions and baseball
7. Introduction to statistical inference
8. Topics in statistical inference
9. Modelling baseball using a Markov chain

Readership: Students of statistics who need this familiar and appealing motivation on which to base their studies. Sports enthusiasts who are keen to learn more about baseball performance and strategy by the use of statistics

This book is designed to use the vehicle of a game familiar to all those students in its main markets (USA/Canada, Japan, Puerto Rico, Cuba, ...) to motivate the main ideas of data handling and statistical analysis.

Baseball generates data on every aspect of the game and much more of it than any other game with any claim to be mainstream – certainly much more even than cricket! That baseball has retained essentially the same main features since its inception, means that most of the categories of data are quite comparable over a period stretching back to the nineteenth century.

The author was co-author with J. Bennett of an earlier book [Curve Ball, 2001, Springer-Verlag (Copernicus)], which celebrated the uses of statistics in baseball. In this new book, the aim is to formalize statistics teaching/learning using baseball as a vehicle. In an American culture, this is very likely to be successful, but probably not elsewhere. After all, those of us in Europe who watch games beamed live from the US Major Leagues, necessarily do so at hours of the day which are (rightly) regarded as extremely unsocial! Hence even the rules, let alone the finer points, are not common currency. The general idea, of course, might well be adaptable in some respects to other games.

Imperial College of Science, Technology and Medicine London, U.K. F.H. Berkshire

GRADE INFLATION – A CRISIS IN COLLEGE EDUCATION, V.E. Johnson.

Contents:
1. Introduction
2. The DUET experiment
3. Grades and student evaluations of teaching
4. DUET analysis of grades and SETs
5. Validity of SETs
6. Grades and student course selection
7. Grading equity
8. Conclusions

Readership: University administrators, politicians, educationists, statisticians involved in the design of assessment schemes for teaching and of robust grading procedures

This book examines the phenomenon of grade inflation and its impact on post-secondary education particularly in the USA. This is a very thorough analysis of theways in which variability in grading practice – across institutions, faculties/departments and individual courses – have consequences for the popularity of student choice of options, in student evaluations of teaching (SETs) and in a general degradation of academic standards.

The author was centrally involved with a student evaluation exercise carried out at Duke University in 1998/1999 [DUET-Duke Undergraduates Evaluate Teaching]. The idea was to find the effects that grades (anticipated and received) had on student course selection decisions and on their evaluations of courses and lecturers.

The detailed story of DUET and the discussions of issues of completion rates and non-response, causal effects of grading, standardization procedures and grade adjustment, are essential reading – particularly for all those who either impose, or have imposed upon them, evaluation schemes which are claimed to give objective measures of these things. The discussions are relevant to all post-secondary education systems.

Of course, the regarding of ‘inflated’ grades as true measures of attainment levels, often reflects a self-interest of students, academic faculty, departments, institutions and politicians, so that this practice has no coordinated natural opposition – at least in the short term. However, the effects are quite pernicious and all grading/evaluations should really be carried out through properly de-
signed experiments'. No doubt this dialogue should and will continue!

Imperial College of Science, Technology and Medicine
London, U.K. F.H. Berkshire


Contents:
1. Probability models
2. Random variables and distributions
3. Expectation
4. Sampling distribution and limits
5. Statistical inference
6. Likelihood inference
7. Bayesian inference
8. Optimal inferences
9. Model checking
10. Relationships among variables
11. Advanced topic – stochastic processes

Readership: Students who have studied one year of calculus at university level and seeking an introduction to probability and statistics

This book is an introductory text on probability and statistics that is heavily biased towards the mathematical concepts involved. Most of the mathematical details are included, but it is expected that students have a mastery of calculus before attempting to follow this text. The book can be used without an appropriate statistical package. However, for the maximum benefit to be obtained from this text, access to a computer package would be advantageous. All the computations in the text were carried out using Minitab.

The authors have structured the exercises to enable users to select the exercises which are applicable to them. The structures are called exercises, problems, challenges, computer exercises and computer problems. Exercises are suitable for all students and are there to give practice in applying the concepts. Problems require a more in-depth approach by the students where greater understanding of the concepts is needed. Challenges are only for students who have no difficulty with exercises and problems. Computer exercises and problems are for students to do using appropriate statistical packages. Minitab is the package used and recommended by the authors. Although the authors have included a wealth of questions, there are no solutions provided.

This is a book to recommend to students who wish to acquire a sound mathematical foundation in probability and statistics.

London South Bank University
London, U.K. S. Starlings

APPLIED PROBABILITY. K. Lange.

Contents:
1. Basic notions of probability theory
2. Calculation of expectations
3. Convexity, optimization and inequalities
4. Combinatorics
5. Combinatorial optimization
6. Poisson processes
7. Discrete-time Markov chains
8. Continuous-time Markov chains
9. Branching processes

Readership: Probabilists, graduate students, scientists interested in probabilistic thinking

The author tries to offer to the scientific community at large an introduction to some of the most important aspects of applied probability. From the table of contents, it is clear that the author has chosen a very personal approach by including chapters on combinatorial optimization, Poisson approximation and number theory. On the other hand, this choice illustrates the beauty, utility and relevance of probabilistic thinking in a variety of scientific areas. In particular, pretty applications in computer science and genetics strengthen the overall message of this book, namely to give applied probability the attention it deserves.

Katholieke Universiteit Leuven
Leuven, Belgium J.L. Teugels

AN INTRODUCTION TO MULTIVARIATE STATISTICAL ANALYSIS, 3rd edition. T.W. Anderson.

Contents:
1. Introduction
2. The multivariate normal distribution
3. Estimation of the mean vector and covariance matrix
4. The distributions and uses of sample correlation coefficients
5. The generalized $T^2$-statistic
6. Classification of observations
7. The distribution of the sample covariance matrix and the sample generalized variance
8. Testing the general linear hypothesis; multivariate analysis of variance
9. Testing independence of sets of variables
10. Testing hypotheses of equality of covariance matrices and equality of mean vectors and covariance matrices
11. Principal components
12. Canonical correlations and canonical variables
13. The distributions of characteristic roots and vectors
14. Factor analysis
15. Patterns of dependence; Graphical models

Readership: Graduate students, statisticians

The first edition of this text appeared in 1958, the second in 1984 [Short Book Reviews, Vol. 5, p. 3], and now comes the third after another nineteen years. It contains a new chapter on graphical models, new sections on elliptically contoured distributions at the end of most chapters, and some extra material on reduced rank regression. The additions on elliptically contoured distributions extend the normal-based theory on which the book is centred to non-normal situations, and the graphical models are certainly welcome. However, the dramatic advancements in computing technology that have changed the face of multivariate analysis over the past twenty years are barely mentioned. Consequently, chapters such as those dealing with classification and principal components now present a very limited picture, while aspects such as computationally-intensive inference are not touched on at all. Nevertheless, within the confines of parametric multivariate theory this book remains an authoritative work that can still be highly recommended.

University of Exeter
Exeter, U.K. W.J. Krzanowski
ANALYZING MULTIVARIATE DATA.

Contents:
PART I: Overview
1. Introduction
2. Vectors and matrices
3. Regression analysis

PART II: Analysis of Interdependence
4. Principal components analysis
5. Exploratory factor analysis
6. Confirmatory factor analysis
7. Multidimensional scaling
8. Cluster analysis

PART III: Analysis of Dependence
9. Canonical correlation
10. Structural equation models with latent variables
11. Analysis of variance
12. Discriminant analysis
13. Logit choice models

Readership: Application orientated researchers teaching graduate courses in statistics to students in fields of application

This book is not merely an update of an earlier version but a rebirth giving a fresh look at applying multivariate analysis in this day and age. Although application-orientated, it avoids a “black box” approach but relies on an intelligent, critical intuitive grasp of the working of techniques. Therefore each chapter starts with an intuitive explanation based on the underlying geometrical properties of the algebra in the mechanics sense are provided for mathematical derivations are provided in modular form. Each technique is further explained by a practical problem and questions relating to the application of the method. Each chapter is concluded by a learning summary, selected readings and exercises.

The geometrical implications of vector and matrix operations are reviewed as well as multiple linear regression. This lays the foundation for more sophisticated multivariate techniques. Part II deals with analyzing interdependence. A sound introduction is provided on how and when principal components, exploratory factor analysis and confirmatory factor analysis should be applied. The distinction made between classical metric multi-dimensional scaling (MDS), nonmetric MDS, individual difference scaling and MDS preference data illustrates the wide area of potential applications of MDS. A book of this scope cannot confirm the proposed methods. This section some more

INTRODUCTORY BIOSTATISTICS

Contents:
1. Descriptive methods for categorical data
2. Descriptive methods for continuous data
3. Probability and probability models
4. Estimation of parameters
5. Introduction to statistical tests of significance
6. Comparison of population proportions
7. Comparison of population means
8. Correlation and regression
9. Logistic regression
10. Methods for count data
11. Analysis of survival data and data from matched studies
12. Study designs

Readership: Professionals and beginning graduate students in public health, dentistry, nursing, medicine, biomedical sciences

The emphasis in this book is on statistical methods relevant to health studies. For example, it starts with a chapter on counts, proportions, ratios and rates (likely to motivate readers); the section on probability is written mainly in terms of screening tests, confidence intervals for odds ratios and the Mantel-Haenszel method are covered. Chapters 9 and 11 are clearly on methods used in the analysis of health and medical data, and so is Chapter 10 which covers the Poisson regression model. The chapter on study designs deals with sample size determination. The book is clearly written. Some chapters end with brief notes on the fundamentals which flesh out the theory. Samples of SAS procedures are given throughout, and there are Excel instructions in the earlier chapters.

My major criticism relates to the data used in examples and exercises. Some are real and their source is given, others appear to be real but do not give a source, and the remainder could well be fictional. Few of the studies cited are recent but were done in the 1970s or 1980s. Some of the longer sets of data are available from the author, but the book would be of more value were they included on a disk or at least available on a web page.

University of Kent
Canterbury, U.K.

F.R. Jolliffe

BIOSTATISTICAL GENETICS AND GENETIC EPIDEMIOLOGY,

Contents:
Acronyms and Abbreviations
Contributors
200 articles, alphabetically by subject
Author Index
Subject Index

Readership: Statisticians, epidemiologists, geneticists

This is the third volume in the Wiley Series in Biostatistics, and is based on the existing Encyclopedia of Biostatistics, with articles updated and modified where necessary. In addition 42 new articles have been added. Invariably opinions on the choice of topics will differ, but I found that this book in general gave a good coverage of the area. I also thought that the articles were commendably brief and informative. It is impossible to give much detail in the constrained space available, but the articles give a good overview and sufficient ideas for further reading, so that this is an excellent first reference. I expect to use this book frequently in the future and will be very glad to have it on my bookshelves.

Imperial College of Science, Technology and Medicine
London, U.K.

J. Whittaker

MEASUREMENT ERROR AND MISCLASSIFICATION IN STATISTICS AND EPIDEMIOLOGY, P. Gustafson.

Contents:
1. Introduction
2. The impact of mismeasured continuous variables
3. The impact of mismeasured categorical variables
4. Adjusting for mismeasured continuous variables
5. Adjusting for mismeasured categorical variables
6. Further topics

APPENDIX : Bayes MCMC Inference

Readership: Graduate students, practitioners, and researchers in statistics and biostatistics, and epidemiologists with particular interest in quantitative methods

The title of this book implies a breadth greater than the content. In fact, it is only concerned with models for predicting some outcome variable from explanatory variables in the case when an explanatory variable is mis-measured. The author describes the book as neither a textbook nor a research monograph, but rather providing a mix of expository and research-oriented material, and I think this is an accurate description. Its integration of material on continuous and discrete situations is fairly novel. The book adopts the Bayesian perspective, and groups much of the mathematical development at the end of each chapter. It provides a useful introductory overview of the, now large, research literature, and I would recommend it to anyone new to the area.

Imperial College of Science, Technology and Medicine
London, U.K.

D.J. Hand


Contents:
1. Introduction
2. The binary model
3. Maximum likelihood estimation of the binary logit model
4. Some statistical tests and measures of fit
5. Outliers, misclassification of outcomes, and omitted variables
6. Analyses of separate samples
7. The standard multinomial logit model
8. Discrete choice or random utility models
9. The origins and development of the logit model

Readership: Students of statistics, econometrics and epidemiology

This slim volume is designed for newcomers to the subject and I suggest that one initially reads it in a cursory manner before returning to any topic in depth.

The text provides an easy-to-read introduction to the theory underlying logit analysis and gives a thorough exposition of the technique of estimation; with computational routines for the logit model forming a common part of general statistical packages. The author makes repeated use of a set of data on private car-ownership of Dutch households which can be downloaded from the Cambridge University Press website. These data form the basis of the worked examples which will be invaluable for those new to logit analysis.

The author has assumed that the reader is familiar with ordinary linear regression and with the associated
estimation theory and matrix algebra. An historical perspective on the origins and development of the logit model is provided in the final chapter.

CEFAS Lowestoft Laboratory
Lowestoft, U.K. C.M. O'Brien

MEASURES OF INTEROBSERVER AGREEMENT.

Contents:
1. Introduction
2. Reliability for continuous scale measurements
3. Measures of 2 x 2 association and agreement of cross classified data
4. Coefficients of agreement for multiple raters and multiple categories
5. Assessing agreement from dependent data
6. Sample size requirements for the design of a reliability study
7. Workshops

Readership: Medical/other researchers, statisticians

The wealth of literature that addresses the issues of interobserver reliability and agreement can be overwhelming for the researcher. There is confusion surrounding terminology, and to date there has been little attempt to produce a coherent summary of current techniques. This book is much needed, and successfully summarizes some of the more common techniques in current use, identifying appropriate measures and modeling approaches for a number of different situations. The reader is provided with clearly worked examples and workshops that are likely to be very helpful for those undertaking their own analysis. Of particular use to the researcher is the chapter on sample-size requirements as this issue is important and frequently not addressed.

A reasonably high level of statistical understanding is assumed, and the detail provided might at times be confusing for the non-statistician. Both statisticians and non-statisticians would benefit from further clarification of the terminology used and perhaps more detailed discussions on the interpretation of some of the measures presented.

University College London
London, U.K. E. Allen

SURVIVAL ANALYSIS USING S.

Contents
1. Introduction
2. Nonparametric methods
3. Parametric models
4. Regression models
5. The Cox proportional hazards model
6. Model checking: Data diagnostics
7. Additional topics
8. Censored regression quantiles

Readership: Statisticians and scientists

This book grew out of a short course on survival analysis, and retains features of the latter, including concise coverage of basic topics, a point form summary of objectives at the start of each chapter, and instructions (with code) on how to implement the methods discussed using S or R software. The authors express their admiration for D.G. Kleinbaum's 1995 Springer book Survival Analysis: A Self-Learning Text and adopt several of its features. The result is a well-written, accessible introduction to basic survival analysis methods. The book does not offer much theoretical background and its choice and coverage of topics is limited; therefore it seems best suited for short courses, self-study, or as supplementary material on S implementation. One interesting feature deserves special mention: a final chapter on nonparametric regression quantile methods written by Stephen Portnoy. This useful methodology is not covered in other books on survival analysis.

University of Waterloo
Waterloo, Canada J.F. Lawless

RANDOMIZATION IN IN CLINICAL TRIALS: THEORY AND PRACTICE. W.F. Rosenberger and J.M. Lachin.
US$83.95/E52.50/E76.40.

Contents:
1. Randomization and the clinical trial
2. Issues in the design of clinical trials
3. Randomization for balancing treatment assignments
4. Balancing on known covariates
5. The effects of unobserved covariates
6. Selection bias
7. Randomization as a basis for inference
8. Inference for stratified, blocked, and covariate-adjusted analyses
10. Response-adaptive randomization
11. Inference for response-adaptive randomization
12. Response-adaptive randomization in practice
13. Some useful results in large sample theory
14. Large sample inference for complete and restricted randomization
15. Large sample inference for response-adaptive randomization

Readership. Graduate students in biostatistics, practising statisticians and clinical trialists

This is a scholarly review of the whole topic of randomization in clinical trials. The full range of available methods is described, from simple randomization through the biased-coin design and urn models to response-adaptive schemes that attempt to randomize more patients to the better treatment. Their abilities to achieve desired allocation ratios, while minimizing accidental bias and predictably allocations, are explored. Sufficient mathematical detail is given for the interested reader to understand the derivations, but formal proofs are avoided. The authors are proponents of randomization-based inference, which is systematically described, and model-based inference is also covered. Alongside the theoretical development is discussion of practical considerations and examples.

With its extensive sets of problems and discussion exercises, the book should be very useful in graduate courses in biostatistics. Researchers will find both a valuable guide to the literature and a number of suggestions for future research. The statistician working in clinical trials will be mainly interested in reading the variety of available randomization schemes, but may be disappointed by the lack of concrete recommendations. For all of these groups of statisticians, this book will form a valuable reference work.

Medical Research Council
Cambridge, U.K. I. White

MODELLING SURVIVAL DATA IN MEDICAL RESEARCH.

Contents:
1. Survival analysis
2. Some non-parametric procedures
3. Modelling survival data
4. Model checking in the Cox regression model
5. Parametric proportional hazards models
6. Accelerated failure time and other parametric models
7. Model checking in parametric models
8. Time dependent variables
9. Interval censored survival data
10. Sample size requirements for a survival study
11. Some additional topics
12. Computer software for survival analysis

Readership: Statisticians in any field; students of statistics, researchers doing their own analyses

This book is a revised version of the author's original book, which was published in 1994 [Short Book Reviews, Vol. 14, p. 25]. The content is re-organized and extended to include developments that have occurred over the intervening years. The chapter headings give an idea of the scope of the book. The counting processes approach to survival analysis is only mentioned incidentally, but references are given.

In the first edition, survival analysis programs offered by a number of statistical packages, were reviewed. In this edition the author has restricted himself to detailed examples of the SAS survival analyses procedures. Comments on their outputs are given with mention of parts, such as "Type III analysis of effects", that should be ignored!

The title of this book may suggest that it would be only useful in medically related research. This is far from the case. It could profitably be used by anyone, who has survival data to analyze. A complete novice, armed with a SAS output, who carefully follows the examples of model fitting and checking in chapters three and four, should not go far wrong! However the scope of the book goes far beyond that. Throughout it aims to convey an appreciation of the theoretical underpinnings of the subject. Of particular value are chapters five and six on the parametric proportional hazards and the accelerated failure time models, respectively. The author shows how each model is produced by different parameterizations of the Weibull and exponential distributions. As in all other chapters, these models are fitted to an appropriate set of data and the parameters interpreted in the context of the data.

For a student following a course in survival analysis or the applied statistician, this book is full of practical insights, and exemplifies the very best in statistical practice. The author has a rare gift for lucid exposition. The book is highly recommended.

University of Cape Town
Rondebosch, South Africa
J.M. Juritz

STATISTICAL METHODS FOR SURVIVAL DATA

Contents:
1. Introduction
2. Functions of survival time
3. Examples of survival data analysis
4. Nonparametric methods of estimating survival functions
5. Nonparametric methods for comparing survival distributions
6. Some well-known parametric survival distributions and their applications
7. Estimation procedures for parametric survival distributions without covariates
8. Graphical methods for survival distribution fitting
9. Tests of goodness of fit and distribution selection
10. Parametric methods for comparing two survival distributions

Readership: Biostatisticians, graduate students in biostatistics and epidemiology

This is the third edition of a well-known monograph [Original 1980; Review of second edition Short Book Reviews, Vol. 13, p. 3]. New material includes mathematical details related to likelihood inference, a broader overview of models with nonproportional hazards and an expanded chapter on linear logistic regression. The result is a comprehensive and clearly written textbook which is also accessible to applied researchers with limited mathematical background. The examples are very helpful and often shown with the relevant programming codes for BMDP, SAS and SPSS.

The first part of the book, aimed at introducing the reader to the special issues arising with survival data, includes a chapter of examples of published data. This has the notable advantage of giving an immediate feel for the complexities of dealing with survival data. It has, however, the disadvantage of using terminology and methods still unfamiliar to a newcomer to the subject. Some simple description of the reasons why certain methods are used (or in some cases should not be used) would make this chapter more useful.

Part II of the book introduces nonparametric methods for survival analysis. Unlike other textbooks in survival analysis it includes references to relative survival methods and standardized mortality and incidence ratios, thus making the connection with related material which is usually confined to textbooks in descriptive epidemiology.

Part III deals with parametric methods and is the more extensive of the book, covering nine of its fourteen chapters. The contents are well organized and detailed, always supported by real examples of data and often by software codes. Of interest are the sections on competing risks and the recurrent events models.

Overall this is a very good reference and an excellent, if somewhat over-detailed, textbook. Throughout there are interesting exercises, some of which may be useful for drafting examination questions as well as for illustrations.

London School of Hygiene and Tropical Medicine
London, U.K.
B. De Stavola

SEMI PARAMETRIC REGRESSION
D. Ruppert, M.P. Wand and R.J. Carroll. Cambridge University Press, 2003, pp. xvi + 386, £70.00/US$100.00 Cloth; £29.95/US$45.00 Paper.

Contents:
1. Introduction
2. Parametric regression
3. Scatterplot smoothing
4. Mixed models
5. Automatic scatterplot smoothing
6. Inference
7. Simple semiparametric models
8. Additive models
9. Semiparametric mixed models
10. Generalized semiparametric regression
11. Generalized additive models
12. Interaction models
13. Bivariate smoothing
14. Variance function estimation
The book deals with nonparametric goodness-of-fit testing problems from the literature of the past twenty years. The setting is based on the asymptotic variant of the minimax approach. The key element is the construction of asymptotically least favorable priors for a wide class of nonparametric testing problems. The method leads to various types of asymptotically optimal tests. The problems are studied within Gaussian models. It is a theoretical book with mathematical results rather than solutions to applied problems in engineering or medicine. The proofs of the theorems are very detailed and many details are in the appendix of more than one hundred pages.

Limburgs Universitair Centrum
Diepenbeek, Belgium
N.D.C. Veraverbeke

NONPARAMETRIC STATISTICAL INFERENCE
4th edition, revised and expanded.

Contents:
1. Introduction and fundamentals
2. Order statistics, quantiles, and coverages
3. Tests of randomness
4. Tests of goodness-of-fit
5. One-sample and paired-sample procedures
6. The general two-sample problem
7. Linear rank statistics and the general two-sample problem
8. Linear rank tests for the location problem
9. Linear rank tests for the scale problem
10. Tests of the equality of k independent samples
11. Measures of association for bivariate examples
12. Measures of association in multiple classifications
13. Asymptotic relative efficiency
14. Analysis of count data

Readership: Statisticians, final year undergraduate and graduate statistics students

The facts that the first edition of this book was published in 1971 and that it is now in its fourth and revised edition are testimony to the book's success over a long period. The last revision was in 1992. The authors' goals in this latest edition were to bring the material covered into the twenty-first century and to make the material more user friendly.

New material and references have been added, and some material has been reorganized. Greater emphasis has been placed on P values. The computer packages for which sample output of problem solutions is included are now MINITAB, SAS, STATXACT, and SPSS, reflecting current teaching and professional usage. Exact solutions obtained by hand are also given.

Apart from the first chapter, every chapter starts with an introduction and finishes with a summary and problems. There are both theoretical and data-based problems, and answers are given to a selection. Derivations and proofs are integrated with applications in the text, but it is not necessary to read every line of algebra in order to find out when a method is appropriate or how to implement it. The book is readable and clearly written and would be a valuable addition to every statistician's library.

University of Kent
Canterbury, U.K.
F.R. Jolliffe

Contents:
1. Introduction
2. Estimating functions
3. Numerical algorithms
4. Working with roots
5. Methodologies for root selection
6. Artificial likelihoods and estimating functions
7. Root selection and dynamical systems
8. Bayesian estimating functions

Readership: Graduate students and research workers in statistics

Statistical problems often require the solution of estimation equations to obtain estimates. Sometimes multiple solutions occur, the equations exhibit nonlinearity and iterative solution methods are called for. This text provides a nicely written survey of this specialist field, written from mathematical and computing points of view, and makes use of MAPLE, MATLAB and Mathematica programming methods. It is an excellent book for its intended audience. Minor point: On page iv we see "The moral rights of the author have been asserted"; this statement is not further explained. More information can be found at www.hmso.gov.uk/acts/acts1988/Ukpga_19880048_en_5.htm#mdiv77 and www.ariadne.ac.uk/issue4/copyright/.

University of Wisconsin
Madison, N.R. Draper


Contents:
1. Preliminaries and the finite dimensional case
2. M(X) and priors on M(X)
3. Dirichlet and Polya Tree process
4. Consistency theorems
5. Density estimation
6. Artificial likelihoods and estimating functions
7. Regression problems
8. Uniform distribution on infinite-dimensional spaces
9. Survival analysis - Dirichlet priors
10. Neutral to the right priors
11. Exercises

Readership: Academic (postgraduate students and researchers in Bayesian nonparametrics)

The style of the book is well summarized in the following quotations: "This monograph provides a systematic, theoretical development of the subject." and "We view this book as an introduction to the theoretical aspects of the topic at a graduate level. There is no coverage of the important aspect of computations." The treatment is quite formally mathematical, and not for the faint-hearted; the material largely comprises definitions, propositions, theorems and proofs. A strong background in mathematics, including the measure-theoretic approach to probability is required.

The Introduction, "Overview and Summary", is unusually long and detailed, and does its job very well. In the words of a current television advertisement for a weather-proofing liquid, "It does exactly what it says on the tin". The prerequisites are briefly outlined in Chapter 1: these include metric spaces (compactness, separability, Borel sigma-algebras and weak convergence), posterior consistency and robustness, and non-regular theory.

Chapter 2 is mainly concerned with existence theorems for priors on an infinite-dimensional parameter space, typically the set of all probability measures on the sample space. Chapter 3 gives detailed coverage of the Dirichlet process prior, essential study for this area. The Polya Tree process is also described; this is a more recent framework that yields a richer class of priors at some cost in mathematical tractability. Chapter 4 contains a bunch of theorems relating to posterior consistency, and the results are applied in subsequent chapters. Chapter 5 ("this rather technical chapter") focuses on priors for density estimation and their consistency. Chapter 6 gives results concerning posterior consistency for the location parameter in a semi-parametric setting and proposes suitable Polya Tree priors. The related set-up of a linear regression model is tackled in Chapter 7, in which the coefficients and error distribution are to be estimated. The question in Chapter 8 is how to construct a non-informative prior on an infinite-dimensional space; a starting point is the Jeffreys' prior for a finite-dimensional parameter. Survival analysis, with right-censored observed failure times, is addressed in Chapters 9 and 10, where appropriate priors are suggested and investigated. Some miscellaneous exercises are presented in Chapter 11 and the index contains references to subjects and authors in roughly equal amounts.

The book will find a place as essential study for researchers in this modern area of statistics. It is well written, the signposts are clearly displayed throughout, and the literature appears to be well documented.

Imperial College of Science, Technology and Medicine
London, U.K.


Contents:
PART I: Fundamentals of Bayesian Inference
1. Background
2. Single-parameter models
3. Introduction to multiparameter models
4. Large-sample inference and frequency properties of Bayesian inference
PART II: Fundamentals of Bayesian Data Analysis
5. Hierarchical models
6. Model checking and improvement
7. Modeling accounting for data collection
8. Connections and challenges
9. General advice
PART III: Advanced Computation
10. Overview of computation
11. Posterior simulation
12. Approximations based on posterior modes
13. Special topics in computation
PART IV: Regression Models
14. Introduction to regression models
15. Hierarchical linear models
16. Generalized linear models
17. Models for robust inference
18. Mixture models
19. Multivariate models
20. Nonlinear models
21. Models for missing data
22. Decision analysis

Readership: Graduate and advanced undergraduate students of statistics, and practitioners and researchers in applied statistics

This second edition [First edition 1995; Short Book Reviews, Vol. 16, p. 5] expands on the already comprehensive first edition with the addition of material on model checking, data collection and computation; new
chapters on nonlinear models and decision analysis; an appendix illustrating computation using the software packages R (general statistics) and Bugs (Bayesian inference); and a remarkable collection of applied examples from the authors’ recent research. The book concentrates on applications and computing on the view that the field has moved beyond philosophical debate about foundations of inference.

Some statistical maturity is expected of the audience, and in return the reader is rewarded with exceptionally cogent and precise discussions of Bayesian inference, data analysis and computing. It is a pleasure to learn from this book. It is a masterful consolidation of recent developments, especially as a snapshot of the many rapidly expanding areas of application. This is an essential reference for current and future Bayesian data analysts.

Brookfield, U.S.A.
C.A. Fung

THE ANALYSIS OF TIME SERIES. AN INTRODUCTION,

Contents:
1. Introduction
2. Simple descriptive techniques
3. Some time-series models
4. Fitting time-series models in the time domain
5. Forecasting
6. Stationary processes in the frequency domain
7. Spectral analysis
8. Bivariate processes
9. Linear systems
10. Spatio-temporal models and the Kalman filter
11. Non-linear models
12. Multivariate time-series modelling
13. Some more advanced topics
14. Examples and practical advice

Readership: Probabilists, statisticians, time series specialists

The author has succeeded in writing an accessible textbook which is wide-ranging, up-to-date and covering both theory and practice. Following his guideline that rigorous mathematics and practicality can go together, the author offers a wealth of applicable concepts and methods by which real life time series can be analyzed. The text offers a plethora of worked examples while the last section in each chapter contains exercises of different levels of difficulty. Its sixth (and final) edition (first edition 1975) should continue to hold the book’s reputation on the market as one of the most accessible and popular textbooks on time series currently available.

Katholieke Universiteit Leuven
Leuven, Belgium
J.L. Teugels


Contents:
1. Introduction
2. Characteristics of time series
3. ARMA modelling and forecasting
4. Parametric nonlinear time series models
5. Nonparametric density estimation
6. Smoothing in time series
7. Spectral density estimation and its applications
8. Nonparametric models
9. Model validation
10. Nonlinear prediction

Readership: Academic (researchers and postgraduate students in statistics, economics, finance, business); industry (investment banking, insurance)

A couple of quotations from the Preface serve to convey the style and purpose of the book: “The aim of this book is to advocate those modern nonparametric techniques that have proven useful for analyzing real time-series data, and to provoke further research in both methodology and theory for nonparametric time-series analysis”; “We hope that this book will reflect the power of the integration of nonparametric and parametric approaches in analyzing time-series data.”

The book is aimed at a broad readership, the prerequisites being just a grounding in probability (not measure-theory) and statistical methods. The more technical material (proofs of theorems, etc.) is generally relegated to “Complements” sections. Also, most chapters end with “Further Reading” or “Bibliographic Notes”.

Chapter 1 gives some examples of time series: linear (white noise, AR, MA, etc.) and nonlinear (ARCH, threshold, nonparametric autoregressive). Chapter 2 covers stationarity, autocorrelation, spectral densities, the periodogram, long-memory processes and mixing conditions. Chapter 3 focuses on ARMA models (best linear prediction, maximum likelihood estimation, order determination, diagnostics, and linear forecasting). Chapter 4 covers threshold models, ARCH and GARCH, and bilinear models. Various aspects of kernel density estimation are discussed in Chapter 5, including windowing and whitening, bandwidth selection, boundaries, and asymptotics. In Chapter 6 smoothing is addressed, in both time and state domains, splines, and estimation of conditional densities. Spectral density estimation occupies Chapter 7 with material on tapering, kernel estimation and prewhitening, “automatic” methods, and tests for white noise. Chapter 8 addresses multivariate local polynomial regression, functional-coefficient autoregressive models, adaptive versions, additive models, and conditional variance models. In Chapter 9 model validation is considered: generalized likelihood ratio tests, tests on spectral densities, autoregressive versus nonparametric models, and threshold versus varying-coefficient models. The last chapter, Chapter 10, covers nonlinear prediction, with material on characteristic features thereof, point and interval prediction, and predictive distributions.

This is a book that one can read as a beginner or as an expert. Although there are plenty of theorems, there are also plenty of numerical examples, with both real and simulated data, and lots of pictures and graphics (SPLUS-style). The topics are very fully explained and discussed, and there are many pointers to the literature for further study (with about six hundred references listed).

Imperial College of Science, Technology and Medicine
London, U.K.
M.J. Crowder

CASE STUDIES IN RELIABILITY AND MAINTENANCE
W.R. Blischke and D.N. Prabhakar Murthy (Eds.).

Contents:
PART A: Cases with Emphasis on Production Design
PART B: Cases with Emphasis on Development and Testing
PART C: Cases with Emphasis on Defect Prediction and Failure Analysis
PART D: Cases With Emphasis on Maintenance and Maintainability
PART E: Cases with Emphasis on Operations Optimization and Re-engineering
PART F: Cases with Emphasis on Product Warranty
Readership: Industry (manufacturing, maintenance, engineering); Academic (researchers and postgraduate students in Applied Statistics, Operational Research, Engineering)

This is an edited volume, with contributors from both academia and industry. There are applications from many branches of engineering giving a wide range of practical case studies. These are well set out, mostly beginning with a description of the context, the issues and objectives. This is followed by an outline of the mathematical and statistical methods to be used, after which the data are presented, discussed and analyzed, and conclusions drawn. A major aim, well served here, is to help bridge the gap between theory and practice.

The titles of the chapters are fairly self-explanatory. Each ends with a list of references and, unusually for an edited volume, exercises. Most chapters also present real sets of data. For these reasons, I would say that this book can make an extremely useful source for practitioners, students and teachers.

Imperial College of Science, Technology and Medicine
London, U.K. M.J. Crowder

EXPLORATORY DATA MINING AND DATA CLEANING

Contents:
1. Exploratory data mining and data cleaning: An overview
2. Exploratory data mining
3. Partitions and piecewise models
4. Data quality
5. Data quality: Techniques and algorithms

Readership: Data analysts who need to analyze large amounts of unfamiliar data, operations managers and students in undergraduate or graduate-level courses dealing with data analysis and data mining

The aim of the book is 'to develop a systematic process of data exploration and data quality management.' Up to about page 70, it is really an introduction to the sort of exploratory and descriptive techniques used in data mining. After that, the practicalities of accessing and manipulating large sets of data are discussed, that is, from here on the differences between statistics and data mining become more apparent.

In Chapter 4, the book turns to a discussion of data quality. This has always been a key issue for data analysts; 'Garbage in, garbage out', as our computer scientist colleagues say. But with the growth in size of collections of data, the relevance of data-quality issues are becoming more apparent. The authors correctly point out that most data mining and data analysis books have assumed that the data have been cleaned prior to analysis, perhaps not surprisingly since the analytic stage is nearer to the excitement of the end result. Typically, rough and ready solutions have been adopted, such as dropping incomplete or distorted cases. Such a strategy in itself can lead to distortion, and it assumes that one knows that the data are distorted to start with.

There are some oddities in the book. For example, on p. 108, we find that 'Fisher (1966) is a good reference for the statistical design of experiments'. An important reference perhaps, but probably not one I would recommend to a newcomer to the area in the 21st century. And on p. 142, we find imputation defined as 'the process of guessing the values of missing data'. The running example is also rather disappointing, simply because it is artificial, albeit imaginative (an ecosystem containing Snarks, Gryphons and Unicorns). I am sorry, but I find that example queries such as (p. 75) 'For each year 1900 to 2002, report the average weight of Gryphons on the North face of Mt Everest.' just do not do it for me. I generally find that students are more convinced of the relevance of the tools I am describing when I use real examples. But maybe I am being too much of a purist.

The book does give many examples of how data can become corrupted, but, at the end, I wonder to what extent the problems one encounters in one's own studies are too specific to be helped by a general text such as this. This having been said, it is nice to see an attempt to inject some rigour and formality into this ubiquitous and very difficult problem.

Imperial College of Science, Technology and Medicine
London, U.K. D.J. Hand

STRICTED MODELING AND ANALYSIS FOR DATABASE MARKETING: EFFECTIVE TECHNIQUES FOR MINING BIG DATA

Contents:
1. Introduction
2. Two simple data mining methods for variable assessment
3. Logistic regression: The workhorse of database response modeling
4. Ordinary regression: The workhorse of database profit modeling
5. CHAID for interpreting a logistic regression model
6. The importance of the regression coefficient
7. The predictive contribution coefficient: A measure of the predictive importance
8. CHAID for specifying a model with interaction variables
9. Market segment classification modeling with logistic regression
10. CHAID as a method for filling in missing values
11. Identifying your best customers: Descriptive, predictive, and look-alike profiling
12. Assessment and validation of database marketing models
13. Bootstrapping in database marketing: A new approach for validating models
14. Visualization of database models
15. Genetic modeling in database marketing: The GenIQ model
16. Finding the best variables for database marketing models
17. Interpretation of coefficient-free models

Readership: Data analysts concerned with database marketing

The back cover of this book says 'traditional statistical methods are limited in their ability to meet the modern challenge of mining large amounts of data' and then the contents lists a selection of predominantly traditional statistical methods. I wonder if we, the statisticians, are largely to blame for this misconception, by focusing, in our introductory courses, on detailed foundational aspects rather than on the more advanced tools which we teach in later courses.

This book is not aimed at statisticians. It includes very few mathematical formulae, which will make it attrac
tive to its intended audience. On the other hand, I found that its simplifications grated considerably and could easily lead to misconceptions. For example, right on page 1 we read that 'mean profitability is not a valid summary measure if the individual profit values are not bell-shaped'. Apart from the puzzle of how individual values can be bell-shaped, the fact is that whether or not the mean is a valid summary measure depends on the question one is trying to answer.

Imperial College of Science, Technology and Medicine
London, U.K. D.J. Hand

APPLIED DATA MINING: STATISTICAL METHODS FOR BUSINESS AND INDUSTRY. P. Giudici.

Contents:
1. Introduction
PART I: Methodology
2. Organisation of the data
3. Exploratory data analysis
4. Computational data mining
5. Statistical data mining
6. Evaluation of data mining methods
PART II: Business Cases
7. Market basket analysis
8. Web clickstream analysis
9. Profiling web visitors
10. Customer relationship management
11. Credit scoring
12. Forecasting television audiences

Readership: Advanced undergraduate and postgraduate students of data mining, applied statistics, database management, computer science and economics

The subtitle shows that this book is restricted to commercial applications of data mining. Within those bounds, the book seeks to 'establish a bridge between data mining methods and applications'. It is thus intermediary between the (few) more rigorous methodological books on data mining and the (many) superficial books aimed at managers. The author claims that the first part 'gives a broad coverage of all methods currently used for data mining' – which, of course, is a challenge to reviewers to think of methods which are not covered. However, resisting such temptation, I will comment that the coverage is good, and certainly does include most of the main data mining tools. The first part of the book has chapters devoted to 'computational' and 'statistical' data mining. This distinction seems to me at best tenuous and at worst unsustainable in the modern world of data analysis. For example, the first of these chapters includes linear regression (surely a classic statistical tool if ever there was one), logistic regression (a type of glm, which is covered in the statistical chapter), and tree models (the seminal CART book was written by statisticians), while the second includes graphical models (an area developed in collaboration by computer scientists and statisticians). However, that is a cavil, and does not substantiably detract from the value of the book. Its primary unique feature is the second part, which provides a set of case studies. I am sure these will be enlightening to anyone entering the area of data mining for the first time.

The book has a nice balance between theory and applications, and I will certainly recommend it to my students.

Imperial College of Science, Technology and Medicine
London, U.K. D.J. Hand

AN INTRODUCTION TO CREDIT RISK MODELING.
C. Bluhm, L. Overbeck and C. Wagner.

Contents:
1. The basics of credit risk management
2. Modeling correlated defaults
3. Asset value models
4. The credit risk model
5. Alternative risk measures and capital allocation
6. Term structure of default probability
7. Credit derivatives
8. Collateralized debt obligations

Readership: Risk managers and financial engineers looking for a quantitative approach to credit portfolio analysis. Students attending postgraduate courses in finance

This book is an introduction to quantitative credit risk. Its focus is primarily on statistical analysis of credit portfolios. After an introduction of the basic concepts, the most common credit portfolio models used in the industry (KMV, Credit Metrics, Credit Risk+) are described. The analysis is quantitative and is performed rigorously, without, however, losing focus or clarity. Central is the description of the dependency structures between obligors. In the second half of the book there is a brief overview of the most common credit derivatives. Pricing techniques are briefly considered to give just a flavour of the main issues. In the last chapter CDO and CLO structures are described. Even if only few characteristics of the product are considered, the chapter is interesting as it combines pricing with portfolio analysis.

This book can be useful particularly to credit risk managers, interested in quantitative analysis or implementation of credit portfolio models. I can therefore recommend it as a very nice and clear introduction to this topic.

UBS AG,
London, U.K. G. Cesari

FOUNDATIONS OF RISK ANALYSIS. A Knowledge and Decision-Oriented Perspective. T. Aven.

Contents:
1. Introduction
2. Common thinking about risk and risk analysis
3. How to think about risk and risk analysis
4. How to assess uncertainties and specify probabilities
5. How to use risk analysis to support decision-making
6. Summary and conclusions

Readership: Anyone interested in the notion of risk, especially those with a less technical background in stochastics

Coming more from an engineering background, the author approaches risk and uncertainty from a predictive, Bayesian point of view. A risk analysis starts from prediction of observable quantities. Uncertainty with respect to the values of these quantities is expressed by means of probabilities. Models to be analyzed are deterministic functions of the observables. In the various chapters, this definition is worked out more precisely and illustrated on several examples. The approach is non-technical, at least for a probabilist or statistician. The latter may find the way in which someone outside the mainstream of stochastic-academia pedagogically handles the notion of risk.
I found the text refreshing, very well written, useful for its intended audience and in line with the way most statisticians would approach the problem.

RISK ANALYSIS IN ENGINEERING AND ECONOMICS.

Contents:
1. Introduction
2. Risk analysis methods
3. System definition and structure
4. Reliability assessment
5. Failure consequences and severity
6. Engineering economics and finance
7. Risk control methods
8. Data for risk studies

Readership: Statisticians, engineers, economists, finance people, reliability specialists

The book develops a philosophical foundation for the essentials of knowledge and ignorance. After offering the terminology and practice of risk management, it guides the reader to practical problems from engineering and economics. While the stochastic modelling component of risk analysis is only marginally treated, the book concentrates on algorithmic decision making and practical, conventional statistical procedures, common in reliability and financial engineering. A final chapter deals with information on data sources and failure.

Katholieke Universiteit Leuven
Leuven, Belgium

J.L. Teugels

RISK ANALYSIS IN FINANCE AND INSURANCE.

Contents:
1. Foundations of financial risk management
2. Advanced analysis of financial risks
3. Insurance risks, foundations of actuarial analysis

Readership: Students interested in mathematical finance and insurance risk theory

An alternative (though somewhat long) title could have been: “An introduction to discrete time mathematical finance with an excursion to the continuous time world, a first encounter with the ruin model for insurance risk and examples of the interplay between insurance and finance.” The first half of the book gives a readable introduction to what we now may call “classical discrete time mathematical finance”. The standard results are complemented by more recent results on incompleteness and hedging in such markets. Several worked examples make the formulae come to life. The continuous time (Black-Scholes-Merton) model is obtained through a limit procedure and more formally through SDE theory. Chapter 3 introduces some basic insurance concepts, concentrating most on the famous Cramér-Lundberg type models where financial as well as insurance risk is present. Several examples, exercises, and C++ computer programs help the reader to digest the material introduced. The discussion of both insurance as well as finance models is a novelty. The way this combination is motivated may still look rather artificial from a practical point of view; it is however nice to see these processes treated (almost) at par in one text. This book may well serve as a starting point for others to go the same road. It would have been nice if the publishers would have insisted on a final (extra) proof-reading, especially on the English.

ETH-Zürich
Zürich, Switzerland
P.A.L. Embrechts

WEAK CONVERGENCE OF FINANCIAL MARKETS.

Contents:
1. Weak convergence of stochastic processes
2. Weak convergence of financial markets
3. The basic models of approximation

Readership: Probabilists, audience with sound mathematical background

The book recalls techniques and results of weak convergence of stochastic processes in mathematical finance and covers a wide range of applications. In the first chapter, results on weak convergence of stochastic processes are summarized; the second chapter deals with the question of how to apply these results, whereas in the third chapter techniques are given on how to construct discrete-time models which converge to continuous-time models. Most of the results presented are new and are given without proof. For readers very well acquainted with the material, it may serve as a good reference book on the subject. A drawback is the sometimes uncommon numbering of sections, propositions, theorems etc. and the unsatisfactorily small subject index.

Technische Universität Berlin
Berlin, Germany
F. Esche

INFINITE DIVISIBILITY OF PROBABILITY DISTRIBUTIONS ON THE REAL LINE.

Contents:
1. Introduction and overview
2. Infinitely divisible distributions on the nonnegative integers
3. Infinitely divisible distributions on the nonnegative reals
4. Infinitely divisible distributions on the real line
5. Self-decomposability and stability
6. Infinite divisibility and mixtures
7. Infinite divisibility in stochastic processes

APPENDIX A: Prerequisites from Probability and Analysis
APPENDIX B: Selected Well-Known Distributions

Readership: Researchers in probability theory and stochastic processes

A random variable is infinitely divisible if, for each positive integer n, it can be written (in distribution) as a sum of n independent random variables with the same distribution. This simply formulated concept has an enormous impact on the central limit theory for sums and on the theory of processes with stationary independent increments. But the concept also appears frequently in various more practical aspects of stochastic modelling. The two authors have been working on this book for many years and now they finally come up with a rather complete, very detailed and self-contained survey of the state of the art around the theory and applications of univariate infinite divisibility. All important properties are collected in the three separate chapters according to the support of the distribution (nonnegative integers, nonnegative reals, reals). In each of these chapters, the appropriate transform plays the key role (generating function, Laplace-Stieltjes transform, char-
Contents:
1. Finite state space, a trial run
2. Moving to Euclidian space, the real thing
3. Itô's approach in the Euclidian setting
4. Further considerations
5. Itô's theory of stochastic integration
6. Applications of stochastic integration to Brownian motion
7. The Kunita-Watanabe extension
8. Stratonovich's theory

HISTORY OF PROBABILITY AND STATISTICS AND THEIR APPLICATIONS BEFORE 1750
A. Hald

This is a reprinting of Professor Hald's classic book "History of Probability and Statistics and Their Applications before 1750". It was first published in 1990. Because of the historical interests it seems perhaps appropriate to repeat the review by Professor M. Stone after these thirteen years.

Reprint from Vol. 10, p. 21: "The author wanted to write a different book on nineteenth century statistics. He found it necessary to write this "introduction" instead, to rectify the incompleteness of Todhunter's history and to strike a better balance between the contributions of the earlier period than had been achieved previously. As the contents list suggests, the account goes into great detail, more than enough to assure the reader that the promise of greater completeness and balance has been largely fulfilled. The original sources are described in modern notation, making the account very accessible. The reader is challenged to solve problems suggested by the source material, which was itself largely the result of problem posing and solving. The book should be useful for teachers willing to risk putting some slices of history into their lecture courses."

A review of Professor Hald's A History of Mathematical Statistics from 1750 to 1930 appears in Short Book Reviews, Vol. 18, p. 41.


From the book jacket: "For 400 years, some of the best and brightest minds set out to prove Kepler's conjecture -- like Fermat's celebrated last theorem, one of the oldest unproven mathematical conjectures -- which raised one perplexing question: What is the best way to pack balls as densely as possible? Kepler's Conjecture traces the fascinating history and progression of this geometric puzzle, illustrating how thoroughly this one simple question stymied the mathematical world."

"Sometime toward the end of the 1590s, English nobleman and seafarer Sir Walter Raleigh set this great mathematical investigation in motion. While stocking his ship for yet another expedition, Raleigh asked his assistant, Thomas Harriot, to develop a formula that would allow him to know how many cannonballs were in a given stack simply by looking at the shape of the pile. Harriot solved the problem and took it one step further by attempting to discover how to maximize the number of cannonballs that would fit in the hold of a ship. And thus a problem was born."

"After contemplating the question for a while, Harriot turned to one of the foremost mathematicians, physicists, and astronomers of the time, Johannes Kepler. Kepler did not reflect long, and came to the conclusion that the densest way to pack three dimensional spheres was to stack them in the same manner that market vendors stack their apples, oranges and melons."

"Although this was fine for fruit vendors, until the conjecture could be proven, the mathematical world could not accept it. The first and only popular account of one of the greatest math problems of all time, Kepler's Conjecture examines the attempts of many mathematical geniuses to prove this problem once and for all - from Danish astronomer Tycho Brahe to math greats Sir Isaac Newton and Carl Friedrich Gauss, from modern titans David Hilbert and Bucumriner Fuller to Thomas Hales of the University of Michigan, who in 1998 submitted what seems to be definitive proof."

LESLIE KISH: SELECTED PAPERS.

Leslie Kish (1910-2000) was one of the founding fathers of survey sampling.

From the back cover: "This volume collects, for the first time, Kish's most important papers. The seventeen articles cover wide-ranging topics -- theoretical, practical, and philosophical -- from the role of probability sampling in scientific research to his ideas on professional leadership
and training of statisticians. Bringing together a lifetime of research and practice, *Leslie Kish: Selected Papers* is both a fitting tribute to the genius of the man and a highly useful, one-volume compilation of insight into the art and science of survey statistics."


From the back cover: New in the third edition are: "Detailed discussions on the Gart test for order effects, the Stuart-Maxwell test of marginal homogeneity, the Jonckheere-Terpstra and Page tests for ordered alternatives, the coupon collector's test for randomness, Cohen's kappa, the intraclass correlation coefficient, the binomial effect size display, procedures for dealing with missing data, and the randomized-blocks design;"

"In-depth discussion of the basic principles of probability, including rules accompanied by examples for computing probabilities;"

"Detailed treatment of alternative hypothesis testing models, including a full discussion of Bayes’ theorem and Bayesian hypothesis testing;"

"A comprehensive section on experimental design that includes pre-experimental designs, quasi-experimental designs, true experimental designs, and single-subject designs;"

"An extensive amount of new material, including 22 figures, added to the Introduction to make the book even more accessible to those without a background in statistics."


From the book jacket: "Many complex systems – from immensely complicated ecosystems to minute assemblages of molecules – surprise us with their simple behavior. Consider, for instance, the snowflake, in which a great number of water molecules arrange themselves in patterns with six-way symmetry. How is it that molecules moving seemingly at random become organized according to the simple, sixfold rule? How do the comings, goings, meetings, and eatings of individual animals add up to the simple, sixfold rule? How do the comings, goings, meetings, and eatings of individual animals add up to the simple, sixfold rule? How do the comings, goings, meetings, and eatings of individual animals add up to the simple, sixfold rule? How do the comings, goings, meetings, and eatings of individual animals add up to the simple, sixfold rule?

"In this book, Michael Strevens aims to explain how simplicity can coexist with, indeed be caused by, the tangled interconnections among a complex system's many parts. At the center of Strevens's explanation is the notion of probability and, more particularly, probabilistic independence. By examining the foundations of statistical reasoning in the context of the space of inquiry, he reveals just how the concept of probabilistic phenomena and the basis for introducing probabilistic concepts into physical theory.""


From the back of the book: "*Statistical Tools for Environmental Quality Measurement* provides a detailed review of statistical tools used in analyzing and addressing environmental issues. This book examines commonly used techniques found in USEPA guidelines and discusses their potential impact on decision-making. The authors are not constrained by statistical formalism; they advise when to go outside of standard statistical models when making difficult decisions. The content is presented in a practical style that prioritizes methods that work, based upon the authors’ extensive experience.

"The text points out that simplicity facilitates effective communication of an analysis and decision to a "consumer" of statistics. The book emphasizes the exact question that each procedure addresses, so that environmental scientists and engineers can clearly identify the question they want to ask, and correctly interpret the results."


From the book jacket: "This collection on the application of statistical sciences to environmental problems presents cutting edge statistical techniques for describing, modelling, and monitoring processes or events associated with environmental degradation."

"One of the first of its kind to present numerous case studies in the context of environmental policy, the volume will be of relevance to both environmental specialists as well as policy-makers."


From the back cover: "This book gives a broad picture of the increasingly intimate intercourse of the world of weapons with that of theorems. It shows to what extent the military has played an active part in the shaping of modern mathematics and the careers of mathematicians, in particular since World War II. It investigates how mathematical thinking, mathematical methods, and mathematically supported technology are now about to change the character and performance of modern warfare, and how this influences the public as well as the military. It describes the ethical choices of outstanding individuals like the physicist Niels Bohr and the mathematician Alan Turing in times of war and addresses the question to what extent general ethical discussions can provide guidance for working mathematicians. Finally, it analyzes the role of mathematical thinking in shaping the modern international law of war and peace and the role of mathematical arguments in support for actual conflict resolution."


From the book jacket: "*Putting Science in Its Place* establishes the fundamental importance of geography in both the generation and the consumption of scientific knowledge, using historical examples of the many places where science has been practiced. Livingstone first turns his attention to some of the specific sites where science has been made – the laboratory, museum, and botanical garden, to name some of the more conventional locales, but also places like the coffeehouse and cathedral, ship's deck and asylum, even the human body itself. In each case, he reveals just how the space of inquiry has conditioned the investigations carried out there. He then describes how, on a regional scale, provincial cultures have shaped scientific endeavor and how, in turn, scientific practices have been instrumental in forming local identities."

"From the reception of Darwin in the land of the Maori to the giraffe that walked from Marseilles to Paris,
Livingstone shows that place does matter, even in the world of science.

DECISIONS, UNCERTAINTY, AND THE BRAIN


The author proposes that economic theory may provide an alternative to the classical Cartesian model of the brain.


From the book jacket: "Habits of Mind maintains that the fact that almost everyone now goes to college need not be seen as an obstacle to excellence in education. Some critics have insisted that college is not for everyone, but William B. Allen and Carol Allen assert that the college diploma has rightly become as much the norm in this century as the high school diploma was during the twentieth century. Accordingly, it is essential that higher education remains true to its deepest purpose: the cultivation of proficient humanity. The authors see the key to this goal as the development of judgment, or "habits of mind." Habits of mind are far and away the most influential determinants of human conduct, and nowhere are they more profoundly shaped than in institutions of higher education. Furthermore, liberal education has proven most effective in this undertaking.

"The authors elaborate on the purpose of higher education and identify the chief obstacles to achieving its aim. They demonstrate the critical role of academic leaders in achieving the aim of higher education and posit that excellence in judgment is the primary characteristic of the academic leaders who fulfill this role. They examine three aspects of access to higher education: academic readiness, the cost and funding of higher education, and the capacity of the physical plant. Finally, they use policies developed in Virginia to demonstrate realistic approaches to achieving the aims of access and quality discussed throughout the book.

"The authors draw on their years of experience as practitioners in both private and public institutions, liberal arts colleges, and research universities to develop their material. This volume will be of interest to faculty and students in higher education programs, nation and state policymakers, legislative and academic leaders, and research universities to develop their material. This volume will be of interest to faculty and students in higher education programs, nation and state policymakers, legislative and academic leaders, and students in higher education programs, nation and state policymakers, legislative and academic leaders, and research universities to develop this undertaking.


From the book jacket: "The greatest enterprise of its kind in history" declared British Prime Minister Stanley Baldwin in June 1928 about the publication of the monumental book that was to crown the English language the undisputed monarch of the linguistic world: the Oxford English Dictionary.

"The making of the Dictionary was a remarkable achievement by hundreds of ordinary and extraordinary men and women, whose stories have until now remained untold. Simon Winchester illuminates this diverse cast of characters for the first time, uniting original research and evidence from the Oxford University Press archives with gripping narrative flair."


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"He explained how the moon and the sun tug at the seas to create tides. He salvaged the terms 'time', 'space', 'motion' from the haze of everyday language. We are now all Newtonians when we speak of forces and masses, of action and reaction. When we say that a sports team or political candidate has momentum; when we note the inertia of bureaucracy, and when we stretch out an arm and feel the force of gravity all around us.

"He scribbled millions of words in spidery handwriting, covering every inch in his notebooks.

"He shunned company and friendship and neglected to feed himself properly. He quarrelled bitterly with the great men of his age who professed to understand the sun, the planets and the stars, and he veered at least once to the brink of madness. What he wrote, he wrote for himself alone.

"James Gleick brings us a moving account of the conflicting impulses that pulled at this man's heart; his quiet longings, his rage, his secrecy. More than science, more than biography, more than history, this book tells us how, through one man, we have come to know our own place in the cosmos."


Wolfgang Pauli (1900-1958) was a well-known physicist. This book by Pauli's assistant at the time of his death looks at his life and scientific work and describes the evolution of his thinking. It shows Pauli's sarcastic wit and his dreams, his association with C.G. Jung and his school of psychology.


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