Multivariate and Mixture Distribution Rasch Models
Extensions and Applications

This volume covers extensions of the Rasch model, one of the most researched and applied models in educational research and social science. This collection contains 22 chapters by some of the most recognized international experts in the field. They cover topics ranging from general model extensions to applications in fields as diverse as cognition, personality, organizational and sports psychology, and health sciences and education. The Rasch model is designed for categorical data, often collected as examinees’ responses to multiple tasks such as cognitive items from psychological tests or from educational assessments. The Rasch model’s elegant mathematical form is suitable for extensions that allow for greater flexibility in handling complex samples of examinees and collections of tasks from different domains. In these extensions, the Rasch model is enhanced by additional structural elements that either account for differences between diverse populations or for differences among observed variables.

Features
- Collects research and development work on extensions of the Rasch model aiming at relaxing some fundamental constraints of the original model, more specifically, the item homogeneity assumption and the person homogeneity assumption

Field of interest
Statistics for Social Science, Education, Public Policy, and Law

Target groups
Empirical researchers in education, sociology, psychology in universities and testing organizations, graduate students in psychometrics

Discount group
P

Restricted Parameter Space Estimation Problems
Admissibility and Minimaxity Properties

This monograph is addressed to anyone interested in the subject of restricted-parameter-space estimation, and in particular to those who want to learn, or bring their knowledge up-to-date, about (in)admissibility and minimaxity problems for such parameter spaces.

Features
- Addresses to anyone interested in the subject of restricted-parameter-space estimation, and in particular to those who want to learn, or bring their knowledge up-to-date, about (in)admissibility and minimaxity problems for such parameter spaces

Contents

Field of interest
Statistical Theory and Methods

Target groups
Students, researchers

Discount group
P

Due September 2006
2006. XI, 405 p. (Statistics for Social Science and Behavioral Sciences) Hardcover
ISBN 0-387-32916-1 ► $69.95

Due August 2006
ISBN 0-387-33747-4 ► $59.95

Due August 2006
ISBN 0-387-20271-4 ► $74.95
Finite Mixture and Markov Switching Models

The prominence of finite mixture modelling is greater than ever. Many important statistical topics like clustering data, outlier treatment, or dealing with unobserved heterogeneity involve finite mixture models in some way or other. The area of potential applications goes beyond simple data analysis and extends to regression analysis and to non-linear time series analysis using Markov switching models.

For more than the hundred years since Karl Pearson showed in 1894 how to estimate the five parameters of a mixture of two normal distributions using the method of moments, statistical inference for finite mixture models has been a challenge to everybody who deals with them. In the past ten years, very powerful computational tools emerged for dealing with these models which combine a Bayesian approach with recent Monte simulation techniques based on Markov chains.

Features
► Mixture models are nowadays applied in many different areas such as biometrics, medicine, marketing whereas switching models are applied essentially in economics and finance

Contents

Field of interest
Statistical Theory and Methods

Target groups
Graduate students, researchers

Discount group
P

Experimental Designs: Exercises and Solutions

This volume provides a collection of exercises together with their solutions in design and analysis of experiments. The theoretical results, essential for understanding, are given first. These exercises have been collected during the authors teaching courses over a long period of time. These are particularly helpful to the students studying the design of experiments and instructors and researchers engaged in the teaching and research of design by experiment.

Features
► Provides a collection of exercises together with their solutions in design and analysis of experiments
► These exercises have been collected during the authors teaching courses over a long period of time

Contents
Theoretical results.- Exercises.- Solutions.

Field of interest
Statistical Theory and Methods

Target groups
Graduate students, researchers

Discount group
P

Nonparametrics
Statistical Methods Based on Ranks

Rank tests form a class of statistical procedures that have the advantage of great simplicity combined with surprising power. Since their development in the 1940s and 1950s, they have taken their place as strong competitors of the more classical normal theory methods. Rank tests apply only to relatively simple solutions, such as one-, two-, and s-sample problems, and testing for independence and randomness, but for these situations they are often the method of choice. This reprint of a classic reference book describes these tests and the estimating procedures derived from them, and gives an account of their properties. Even though the field of rank tests has undergone little change, important new methodologies have sprung up that also serve the purpose of freeing statistics from the unrealistic model assumptions that so frequently invalidate its applications. All the tests discussed here are now available in a variety of statistical packages.

Features
► Rank tests form a class of statistical procedures that have the advantage of great simplicity combined with surprising power
► Since their development in the 1940s and 1950s, they have taken their place as strong competitors of the more classical normal theory methods
► Rank tests apply only to relatively simple solutions, such as one-, two-, and s-sample problems, and testing for independence and randomness

Contents
Rank Tests for Comparing two Treatments.- Comparing two Treatments or Attributes in a Population Model.- Blocked Comparisons for two Treatments.- Paired Comparisons in a Population Model and the One-Sample Problem.- The Comparison of More than two Treatments.- Randomized Complete Blocks.- Tests of Randomness and Independence.

Field of interest
Statistical Theory and Methods

Target groups
Graduate students, researchers

Discount group
P
G. Molenberghs, Limburgs Universitair Centrum, Diepenbeek, Belgium; G. Verbeke, Hasselt University, Leuven, Belgium

Models for Discrete Longitudinal Data

This book provides a comprehensive treatment on modeling approaches for non-Gaussian repeated measures, possibly subject to incompleteness. The authors begin with models for the full marginal distribution of the outcome vector. This allows model fitting to be based on maximum likelihood principles, immediately implying inferential tools for all parameters in the models. At the same time, they formulate computationally less complex alternatives, including generalized estimating equations and pseudo-likelihood methods. They then briefly introduce conditional models and move on to the random-effects family, encompassing the beta-binomial model, the probit model and, in particular the generalized linear mixed model.

Features
► The authors also wrote a monograph on linear mixed models for longitudinal data (Springer, 2000) and received the American Statistical Association's Excellence in Continuing Education Award, based on short courses on longitudinal and incomplete data at the Joint Statistical Meetings of 2002 and 2004

Contents

Field of interest
Statistical Theory and Methods

Target groups
Researchers, graduate students

Discount group
P

L. A. Moyé, University of Texas, Houston, TX, USA

Statistical Reasoning in Medicine
The Intuitive P-Value Primer

Lowers the Learning Curve for Physicians and Researchers!
The successful Statistical Reasoning in Medicine: The Intuitive P-value Primer, with its novel emphasis on patient and community protection, illustrated the correct use of statistics in health care research for healthcare workers. Through clear explanations and examples, this book provided the non-mathematician with a foundation for understanding the underlying statistical reasoning process in clinical research, the core principles of research design, and the correct use of statistical inference and p-values.
The P-Value Primer 2nd Edition levels the learning curve of statistics for health care researchers by further de-emphasizing mathematical and computational devices, bringing the principles of statistical reasoning closer to the uninitiated.

Features
► Offers updated material

Contents

Field of interest
Statistics for Life Sciences, Medicine, Health Sciences

Target groups
Physicians, health professionals

Discount group
P

M. A. Proschan, National Heart, Lung, and Blood Institute, Bethesda, MD, USA; K. G. Lan, Johnson & Johnson, Raritan, NJ, USA; J. T. Wittes, Statistical Collaborative, Washington, DC, USA

Statistical Monitoring of Clinical Trials
A Unified Approach

The approach taken in this book is to studies monitored over time, what the Central Limit Theorem is to studies with only one analysis. Just as the Central Limit Theorem shows that test statistics involving very different types of clinical trial outcomes are asymptotically normal, this book shows that the joint distribution of the test statistics at different analysis times is asymptotically multivariate normal with the correlation structure of Brownian motion (“the B-value”) irrespective of the test statistic. The so-called B-value approach to monitoring allows us to use, for different types of trials, the same boundaries and the same simple formula for computing conditional power. Although Brownian motion may sound complicated, the authors make the approach easy by starting with a simple example and building on it, one piece at a time, ultimately showing that Brownian motion works for many different types of clinical trials.

Features
► Offers an accessible, incremental approach to understanding Brownian motion as related to clinical trials ► Shows how to use the B-value approach to monitoring different types of trials ► All three authors are experts in adaptive methodology for clinical trials ► Provides insight into not only monitoring, but power, survival analysis, safety, and other statistical issues germane to clinical trials

Field of interest
Statistics for Life Sciences, Medicine, Health Sciences

Target groups
Researchers, graduate students

Discount group
P
COMPSTAT 2006 - Proceedings in Computational Statistics
17th Symposium Held in Rome, Italy, 2006

The book provides new developments in data analysis and statistical multivariate methods, computational statistics and algorithms, including new topics which are of central interest to modern statistics. The reader will find advanced methodologies and computational methods which are very helpful to analyze real phenomena characterized by large data bases. Furthermore, the volume includes papers devoted to original and innovative applications of recent statistical theory and complex approaches of statistical data analysis.

Contents

Field of interest
Statistics and Computing/Statistics Programs

Target groups
Scientists

Discount group
P

Due September 2006
2006. XXVI, 537 p. 142 illus. With CD-ROM. Softcover
ISBN 3-7908-1708-2 ► $139.00

Due August 2006
ISBN 0-387-32522-0 ► $79.95

Due August 2006
2006. Approx. 435 p. (Studies in Classification, Data Analysis, and Knowledge Organization) Softcover
ISBN 3-540-35977-X ► $119.00

Reliability, Life Testing and the Prediction of Service Lives for Engineers and Scientists

This book is intended for students and practitioners who have had a calculus-based statistics course and who have an interest in safety considerations such as reliability, strength, and duration of load or service life. Many persons studying statistical science will be employed professionally where the problems encountered are obscure, what should be analyzed is not clear, the appropriate assumptions are equivocal, and data are scant. Yet tutorial problems of this nature are virtually never encountered in coursework. In this book there is no disclosure with many of the data sets what type of investigation should be made or what assumptions are to be used. Most reliability practitioners will be employed where personal interaction between disciplines is a necessity. A section is included on communication skills to facilitate model selection and formulation based on verifiable assumptions, rather than favorable conclusions. However, whether the answer is "right" can never be ascertained.

Features
► Saunders has over 30 years of experience in reliability data with the Boeing Company

Contents

Field of interest
Statistics for Engineering, Physics, Computer Science, Chemistry & Geosciences

Target groups
Engineers, scientists, graduate students

Discount group
P

Data Analysis, Classification and the Forward Search

Proceedings of the Meeting of the Classification and Data Analysis Group (CLADAG) of the Italian Statistical Society, University of Parma, June 6-8, 2005

The book presents new developments in data analysis, classification and multivariate statistics, and in their algorithmic implementation. The more methodologically oriented reader will find contributions to the theory of clustering and discrimination, multidimensional data analysis, data mining, and robust statistics with a special emphasis on the novel Forward Search approach. Many papers also provide significant contributions in a wide range of fields of application. Customer satisfaction and service evaluation are two examples of such emerging fields.

Contents

Field of interest
Statistical Theory and Methods

Target groups
Researchers

Discount group
P