Statistical Modeling of the National Assessment of Educational Progress

The purpose of this book is to evaluate a new approach to the analysis and reporting of the large-scale surveys for the National Assessment of Educational Progress carried out for the National Center for Education Statistics. The need for a new approach was driven by the demands for secondary analysis of the survey data by researchers who needed analyses more detailed than those published by NCES, and the need to accelerate the processing and publication of results from the surveys.

Features
- The models and analysis approach are illustrated with detailed results from two NAEP surveys
- The use of a full statistical model avoids the ad hoc methods that are otherwise necessary for the analysis of the data
- The modeling approach is complex and computationally intensive, but less so than the existing methods used for these surveys, and it has the twin advantages of efficiency and optimality

Contents

Fields of interest
Statistics for Social Science, Behavioral Science, Education, Public Policy, and Law; Assessment, Testing and Evaluation; Psychometrics

Target groups
Professional/practitioner

Type of publication
Monograph

Selected Works of Oded Schramm

This volume is dedicated to the memory of the late Oded Schramm (1961-2008), distinguished statistician. Throughout his life, Oded made profound and beautiful contributions to mathematics that will have a lasting influence. In these two volumes, Editors Itai Benjamini and Olle Häggström have collected some of his papers, supplemented with three survey papers by Steffen Rohde, Häggström and Cristophe Garban that further elucidate his work. The papers within are a representative collection that shows the breadth, depth, enthusiasm and clarity of his work, with sections on Geometry, Noise Sensitivity, Random Walks and Graph Limits, Percolation, and finally Schramm-Loewner Evolution. An introduction by the Editors and a comprehensive bibliography of Oded's publications complete the volume. The book will be of especial interest to researchers in probability and statistics, and in the history of these subjects.

Features
- Provides convenient access to significant papers from a highly regarded author working at a time when many of the foundational building blocks of probability and statistics were being put in place
- Includes commentaries by important statisticians
- Includes a complete bibliography

Fields of interest
Statistical Theory and Methods

Target groups
Research

Type of publication
Collection of essays

Statistics for High-Dimensional Data
Methods, Theory and Applications

Modern statistics deals with large and complex datasets, and consequently with models containing a large number of parameters. This book presents a detailed account of recently developed approaches, such as the Lasso and boosting methods. It also provides the mathematical theory behind them, proving their great potential in a large number of settings. Both the methods and theory are then illustrated with real data examples.

Features
- Contains the fundamentals of the recent research in a very timely area
- Gives an overview of the area and adds many new insights
- There is a unique mix of methodology, theory, algorithms and applications
- The number of recent papers on the topic is huge
- Is a welcome consolidation Is an essential for the further development of theory and methods

Contents

Fields of interest
Statistical Theory and Methods; Probability and Statistics in Computer Science

Target groups
Graduate

Type of publication
Monograph
Modern Issues and Methods in Biostatistics

Classic biostatistics, a branch of statistical science, has as its main focus the applications of statistics in public health, the life sciences, and the pharmaceutical industry. Modern biostatistics, beyond just a simple application of statistics, is a confluence of statistics and knowledge of multiple intertwined fields. The application demands, the advancements in computer technology, and the rapid growth of life science data (e.g., genomics data) have promoted the formation of modern biostatistics.

Features
- Displays broad coverage and can be used as a textbook or as a reference text
- Details novel ingredients or developments in methodology, computation algorithms, and applications
- Includes an introduction to the concepts, discussions of methodology, and examples of applications for a diverse range of topics including Multivariate and Multistage Survival Data Modeling, Meta-analysis, Data Mining and Signal Detection, and Bayesian Methods and Applications

Contents

Fields of interest
Statistics for Life Sciences, Medicine, Health Sciences; Data Mining and Knowledge Discovery; Mathematics Education

Target groups
Research

Type of publication
Monograph
Projection Matrices, Generalized Inverse Matrices, and Singular Value Decomposition

Aside from distribution theory, projections and the singular value decomposition (SVD) are the two most important concepts for understanding the basic mechanism of multivariate analysis. The former underlies the least squares estimation in regression analysis, which is essentially a projection of one subspace onto another, and the latter underlies principal component analysis, which seeks to find a subspace that captures the largest variability in the original space. This book is about projections and SVD. A thorough discussion of generalized inverse (g-inverse) matrices is also given because it is closely related to the former. The book provides systematic and in-depth accounts of these concepts from a unified viewpoint of linear transformations finite dimensional vector spaces.

Features
► The book will serve as a useful reference on projectors, generalized inverses, and SVD
► Many of the concepts discussed in the book have been developed only recently
► All three authors of the present book have long-standing experience in teaching graduate courses in multivariate analysis

Contents

Fields of interest
Statistics, general; Statistics for Life Sciences, Medicine, Health Sciences

Target groups
Research

Type of publication
Monograph

Due April 2011

2011. XII, 234 p. 13 illus. (Statistics for Social and Behavioral Sciences, Tentative volume) Hardcover
► € 59.95 | £ 53.99
► * € (D) 64,15 | € (A) 85,95 | sFr 86,00
ISBN 978-1-4419-9886-6