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Bayesian Methods in Structural Bioinformatics

Contents

Part I Foundations: An Overview of Bayesian Inference and Graphical Models.- Monte Carlo Methods for Inferences in High-dimensional Systems.- Part II Energy Functions for Protein Structure Prediction: On the Physical Relevance and Statistical Interpretation of Knowledge based Potentials.- Statistical Machine Learning of Protein Energetics from Experimentally Observed Structures.- A Statistical View on the Reference Ratio Method.- Part III Directional Statistics and Shape Theory: Statistical Modelling and Simulation Using the Fisher-Bingham Distribution.- Statistics of Bivariate von Mises Distributions.- Bayesian Hierarchical Alignment Methods.- Likelihood and Empirical Bayes Superpositions of Multiple Macromolecular Structures.- Part IV Graphical models for structure prediction: Probabilistic Models of Local Biomolecular Structure and their Application in Structural Simulation.- Prediction of Low Energy Protein Side Chain Configurations Using Markov Random Fields.- Part V Inferring Structure from Experimental Data.- Inferential Structure Determination from NMR Data.- Bayesian Methods in SAXS and SANS Structure Determination.

Fields of interests

Statistics for Life Sciences, Medicine, Health Sciences; Molecular Medicine; Biophysics and Biological Physics

Target groups

Research

Product category

Contributed volume

Due March 2012

2012. X, 390 p. 36 illus., 6 in color. (Statistics for Biology and Health) Hardcover
▶ approx. \$109.00
ISBN 978-3-642-27224-0



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L. M. Ludański, Rzeszow Technical University, Poland

Between Certainty and Uncertainty

Statistics and Probability in Five Units With Notes on Historical Origins and Illustrative Numerical Examples

„Between Certainty ; Uncertainty” is a one-of-a-kind short course on statistics for students, engineers and researchers. It is a fascinating introduction to statistics and probability with notes on historical origins and 80 illustrative numerical examples organized in the five units: · Chapter 1 Descriptive Statistics: Compressing small samples, basic averages - mean and variance, their main properties including God's proof; linear transformations and z-scored statistics . · Chapter 2 Grouped data: Udney Yule's concept of qualitative and quantitative variables. Grouping these two kinds of data. Graphical tools. Combinatorial rules and qualitative variables. Designing frequency histogram. Direct and coded evaluation of quantitative data. Significance of percentiles.

Features

▶ Short statistic course with notes on historical origins ▶ Reference book in the field of Intelligent System ▶ Written by leading experts in the field

Contents

Chapter 1 Descriptive Statistics.- Chapter 2 Grouped Data.- Chapter 3 Regression vrs. Correlation.- Chapter 4 Binomial Distribution.- Chapter 5 Normal Distribution. Binomial Heritage.

Fields of interests

Statistics, general; Artificial Intelligence (incl. Robotics); Statistics for Engineering, Physics, Computer Science, Chemistry and Earth Sciences

Target groups

Research

Product category

Monograph

Due January 2012

2012. 215 p. (Intelligent Systems Reference Library, Volume 31) Hardcover
▶ \$129.00
ISBN 978-3-642-25696-7



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P. E. Oliveira, University of Coimbra, Portugal

Asymptotics for Associated Random Variables

The book concerns the notion of association in probability and statistics. Association and some other positive dependence notions were introduced in 1966 and 1967 but received little attention from the probabilistic and statistics community. The interest in these dependence notions increased in the last 15 to 20 years, and many asymptotic results were proved and improved. Despite this increased interest, characterizations and results remained essentially scattered in the literature published in different journals. The goal of this book is to bring together the bulk of these results, presenting the theory in a unified way, explaining relations and implications of the results. It will present basic definitions and characterizations, followed by a collection of relevant inequalities. These are then applied to characterize almost sure and weak convergence of sequences of associated variables. It will also cover applications of positive dependence to the characterization of asymptotic results in nonparametric statistics.

Features

▶ Puts together in an easily accessible way results scattered throughout journals ▶ Includes results on asymptotics for statistical estimators for associated samples ▶ Uses an elementary approach while including recent results on asymptotics

Contents

Positive Dependence.- Inequalities.- Almost Sure Convergence.- Convergence in Distribution.- Convergence in Distribution - Functional Results.- Appendices A General Inequalities.- B General Results on Large.- C Miscellaneous.- References.- Index.

Fields of interests

Statistics, general; Statistical Theory and Methods; Probability Theory and Stochastic Processes

Target groups

Research

Product category

Monograph

Due February 2012

2012. X, 194 p. Hardcover
▶ \$79.95
ISBN 978-3-642-25531-1



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T. D. Pigott, Loyola University, Chicago, IL, USA

Advances in Meta-Analysis

The subject of the book is advanced statistical analyses for quantitative research synthesis (meta-analysis), and selected practical issues relating to research synthesis that are not covered in detail in the many existing introductory books on research synthesis (or meta-analysis). Complex statistical issues are arising more frequently as the primary research that is summarized in quantitative syntheses itself becomes more complex, and as researchers who are conducting meta-analyses become more ambitious in the questions they wish to address.

Features

► Includes more than 50 illustrations and tables ► The book describes multivariate analyses for several indices commonly used in meta-analysis (e.g., correlations, effect sizes, proportions and/or odds ratios) ► It outlines how to do power analysis for meta-analysis for each of the different kinds of study outcome indices ► Features examination of issues around research quality and research design and their roles in synthesis

Contents

Rationale and overview of the book.- Complexities of primary research and meta-analysis.- Fixed, random, and mixed models.- Correlations.- Effect sizes.- Proportion/odds ratio data.- Dependence in primary research and meta-analysis.- Correlations.- Effect sizes (group comparisons and change measures).- Proportion/odds ratio data.- Bayesian approaches.- Missing data.- Combining across designs.- Qualitative studies in synthesis.- Quality assessments.- Studies on quality weighting.- Summary/Conclusions.

Fields of interests

Statistics for Social Science, Behavioral Science, Education, Public Policy, and Law; Statistics, general

Target groups

Research

Product category

Monograph

Due March 2012

2012. XIV, 190 p. 11 illus., 5 in color. (Statistics for Social and Behavioral Sciences) Hardcover

► \$69.95

ISBN 978-1-4614-2277-8



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G. Zheng, National Institutes of Health, Bethesda, MD, USA; Y. Yang, University of Science & Technology of China, Hefei, Anhui, People's Republic of China; X. Zhu, R. C. Elston, Case Western Reserve University, Cleveland, OH, USA

Analysis of Genetic Association Studies

Analysis of Genetic Association Studies is both a graduate level textbook in statistical genetics and genetic epidemiology, and a reference book for the analysis of genetic association studies.

Students, researchers, and professionals will find the topics introduced in Analysis of Genetic Association Studies particularly relevant. The book is applicable to the study of statistics, biostatistics, genetics and genetic epidemiology.

Features

► Authors are leading researchers and professors in the fields of Epidemiology and Biostatistics ► This book presents crucial analysis and information for students, researchers, and professionals ► Illustrations provided here represent data obtained from programs developed by the authors

Contents

Introduction to statistics. - Population genetics. - Introduction to epidemiology. - Single-marker analysis for unmatched case-control data. - Single-marker analysis for matched case-control data. - Bayesian analysis for case-control data. - Robust procedures. - Advanced topics I. - Haplotype analysis for case-control data. - Gene-gene interaction. - Advanced topics II. - Genome-wide association studies (GWAS). - Cost-efficient two-stage designs and analyses for GWAS. - Appendix. - References. - Index.

Fields of interests

Statistics for Life Sciences, Medicine, Health Sciences; Statistics, general

Target groups

Research

Product category

Monograph

Due March 2012

2012. XXII, 434 p. 40 illus., 8 in color. (Statistics for Biology and Health) Hardcover

► \$89.95

ISBN 978-1-4614-2244-0



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