

Statistique

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methods. Features and topics: Recent developments in asymptotic methods. Parametric and non-parametric inference. Distribution theory. Stochastic processes. Order statistics. Record values and characterizations.

Statistique

Elart VON COLLANI, Klaus DRÄGER. — **Binomial distribution handbook for scientists and engineers.** — Un vol. relié, 16 × 24, de XVII, 357 p. + 1 CD-ROM. — ISBN 0-8176-4129-7. — Prix: SFr. 148.00. — Birkhäuser, Boston, 2001.

This book deals with estimating and testing the probability of an event. The purpose of the book is twofold: it aims at providing practitioners with refined and easy to use techniques as well as initiating a new field of research in theoretical statistics. The book contains completely new interval and point estimators that are superior to the traditional ones. This is especially true in the case of small and medium sized samples, which are characteristic for many fields of application. The estimators are tailored to a given situation and take into account that generally one knows the size of the probability to be measured. Thus, according the size of the probability, different estimators should be used, similar to the case of measuring length, where the measurement method depends heavily on the size of the length to be measured. This approach yields more precise estimators and more powerful tests. It may also be applied to other estimation problems.

Ludwig FAHRMEIR, Gerhard TUTZ. — **Multivariate statistical modelling based on generalized linear models.** — Second edition. — Springer series in statistics. — Un vol. relié, 16 × 24, de XXVI, 517 p. — ISBN 0-387-95187-3. — Prix: DM 169.00. — Springer, New York, 2001.

The primary aim of the new edition is to bring the book up-to-date and to reflect on the major new development over the past years. The authors give a detailed introductory survey of the subject based on the analysis of real data drawn from a variety of subjects, including the biological sciences, economics, and the social sciences. Technical details and proofs are deferred to an appendix in order to provide an accessible account for nonexperts. The appendix serves as a reference or brief tutorial for the concepts of the EM algorithm, numerical integration, MCMC, and others. The topics covered include: models for multicategorical responses, model checking, semi- and nonparametric modelling, time series and longitudinal data, random effects models, state-space models, survival analysis.

Samuel KOTZ, Tomasz J. KOZUBOWSKI, Krzysztof PODGÓRSKI. — **The Laplace distribution and generalizations: a revisit with applications to communications, economics, engineering, and finance.** — Un vol. relié, 18 × 26, de XVIII, 349 p. — ISBN 0-8176-4166-1. — Prix: SFr. 158.00. — Birkhäuser, Boston, 2001.

This monograph focuses on the importance of reviving the Laplace distribution and describes the inferential and modeling advantages that this distribution, together with its generalizations and modifications, offers. After presenting an historical introduction to the subject, the authors cover the univariate Laplace distribution, knowledge of which has until now been scattered in the vast statistical, engineering, and mathematical literature. The multivariate and skewed Laplace distribution are discussed here for the first time in detailed monograph form. Generalizations of Laplace distributions and stochastic processes to which they lead are presented as well. Many results, particularly those on the multivariate and skewed Laplace distribution, appear in print for the first time.

R.-D. REISS, M. THOMAS. — **Statistical analysis of extreme values: with applications to insurance, finance, hydrology and other fields.** — Second edition. — Un vol. broché, 17×24, de XVIII, 443 p. + 1 CD-ROM. — ISBN 3-7643-6487-4. — Prix: SFr. 88.00. — Birkhäuser, Basel, 2001.

This book provides a self-contained introduction to the parametric modeling, exploratory analysis and statistical inference for extreme values. Besides numerous data-based examples, the book contains special chapters about flood frequency analysis (coauthored by J.R.M. Hosking), insurance (coauthored by M. Radtke) and finance (coauthored by C.G. de Vries and S. Caserta). In addition, five longer case studies are included that replace those presented in the first edition. The assessment of the adequacy of the parametric modeling and the statistical inference is facilitated by the included statistical software Academic Xtremes, an interactive menu-driven system which runs under Windows 95, 98, 2000, NT. The applicability of the system is enhanced by the integrated programming language StatPascal. It is the declared aim of the second extended edition to enforce the characteristic of the book of providing a broad statistical background.

Yves TILLÉ. — **Théorie des sondages: échantillonnage et estimation en population finie, cours et exercices avec solutions.** — Sciences SUP. Mathématiques. — Un vol. broché, 17×24, de x, 284 p. — ISBN 2-10-005484-8. — Prix: FF 195.00. — Dunod, Paris, distribution Vivendi Universal. Fribourg, Suisse, 2001.

Ce livre offre un aperçu général et cohérent des méthodes statistiques permettant de réaliser les différentes étapes d'une enquête par sondage. Ces étapes sont essentiellement la planification, l'estimation et le traitement des non-réponses. La théorie des sondages est d'abord située dans son contexte historique puis développée dans le cadre de l'approche s'appuyant sur le plan de sondage. Les différentes techniques de planification sont examinées en détail. Un ensemble d'algorithmes de tirage d'échantillon sont intégralement décrits. Les techniques d'estimation classiques sont ensuite appliquées aux plans simples, puis l'estimateur par la régression et les techniques de calage sont appliqués aux plans complexes pour le cas multivarié.

Luisa TURRIN FERNHOLZ, Stephan MORGENTHALER, Werner STAHEL, (Editors). — **Statistics in genetics and in the environmental sciences.** — Trends in mathematics. — Un vol. relié, 17×24, de XIV, 183 p. — ISBN 3-7643-6575-7. — Prix: SFr. 98.00. — Birkhäuser, Basel, 2001.

This book grew out of a Workshop on Statistics in the Sciences held on Monte Verità, Switzerland, in the spring of 1999. It offers a snapshot of the role played by statistics in genetics and in the environmental sciences. A few papers dwell on genetic topics, others deal with risk assessment, in particular involving exposure to chemicals. Pollution is addressed in a survey of problems relating to atmospheric chemistry, and in an article on space debris. The collection finally presents several contributions on modern statistical methods in the sciences. The book will be particularly useful for statisticians who wish to be informed about the use of their methods in the sciences.

David WILLIAMS. — **Weighing the odds: a course in probability and statistics.** — Un vol. broché, 17,5×24,5, de x, 547 p. — ISBN 0-521-00618-X. — Prix: £24.95. — Cambridge University Press, Cambridge, 2001.

In this book, probability is treated not only as the foundations for statistics, but also as an important and challenging subject in its own right. The statistics chapters present both the Frequentist and Bayesian approaches, and include Gibbs-sampling techniques for the practical implementation of Bayesian methods. Central to the book is the main chapter on statistics which gives the theory of linear regression and ANOVA, and explains how MCMC methods allow us greater flexibility in modelling. Everywhere in the statistics, the emphasis is on confidence intervals rather than on hypothesis tests. Concepts such as Kullback-Leibler relative entropy are used

to illuminate several topics. CorWinBUGS is provided for a number of computational examples and simulations.

Analyse numérique

Elaine COHEN, Richard F. RIESENFELD, Gershon ELBER. — **Geometric modeling with splines: an introduction.** — Un vol. relié, 16×24, de XXII, 616 p. — ISBN 1-56881-137-3. — Prix: US\$59.00. — A.K. Peters, Natick, Mass., 2001.

Written by researchers who have helped found and shape the field, this book is a definitive introduction to geometric modeling. The authors present a broad base of fundamentally important techniques for curve and surface representations in computer-aided modeling with focus on how the techniques can be used in design. This book offers a thorough study of the use of splines in general, and B-splines in particular, applied to the domain of geometric modeling. It offers an in-depth look at topics such as knot insertion, degree raising, multi-resolution decomposition and editing, and trivariate and multivariate functions. Appropriate for readers with a moderate degree of mathematical maturity, this book is suitable as an undergraduate or graduate text, and particularly as a comprehensive resource for self-study.

Ronald A. DEVORE, Arieh ISERLES, Endre SÜLI, (Editors). — London Mathematical Society lecture note series, vol. 284. — **Foundations of computational mathematics.** — Un vol. broché, 15,5×23, de VIII, 400 p. — ISBN 0-521-00349-0. — Prix: £34.95. — Cambridge University Press, Cambridge, 2001.

This book presents thirteen papers written by plenary speakers from the 1999 conference, all of whom are the foremost figures in their respective fields. Topics covered include complexity theory, approximation theory, optimisation, computational geometry, stochastic systems and the computation of partial differential equations. The wide range of topics covered illustrates the diversity of contemporary computational mathematics and the intricate web of its interaction with pure mathematics and application area. This book will be of interest to researchers and graduate students in all areas of mathematics involving numerical and symbolic computations.

N. DYN, D. LEVIATAN, D. LEVIN, A. PINKUS, (Editors). — **Multivariate approximation and applications.** — Un vol. relié, 15,5×23,5, de X, 286 p. — ISBN 0-521-80023-4. — Prix: £45.00. — Cambridge University Press, Cambridge, 2001.

Multivariate approximation theory is today an increasingly active research area. It encompasses a wide range of tools for multivariate approximation such as multi-dimensional splines and finite elements, shift-invariant spaces and radial-basis functions. The multivariate setting is important since it models many real-world problems. This advanced introduction to multivariate approximation and related topics consists of nine articles written by leading experts surveying many of the new ideas and their applications. Each article introduces a particular topic, takes the reader to the forefront of research and ends with a comprehensive bibliography.

Tian-Xiao HE. — **Dimensionality reducing expansion of multivariate integration.** — Un vol. relié, 16,5×24, de IX, 225 p. — ISBN 0-8176-4170-X. — Prix: SFr. 118.00. — Birkhäuser, Boston, 2001.

Multivariate integration has been a fundamental subject in mathematics, with broad connections to a number of areas: numerical integration, partial differential equations and Green's function, harmonic analysis, numerical analysis and approximation theory. In this work the exposition focuses primarily on a powerful tool which has become especially important in our computerized age, namely, dimensionality reducing expansion (DRE). The method of dimensionality reducing expansion (DRE) is a technique for changing a higher dimensional integration to a lower dimensional one with or without remainder.