Zeitschrift: L'Enseignement Mathématique

Band: 45 (1999)

Heft: 1-2: L'ENSEIGNEMENT MATHÉMATIQUE

Kapitel: Statistique

Kalman-Bucy theories, as well as relatively new branches such as semidegenerate processes and minimax filtering. The unique two-level approach to filtering problems is applied depending on their complexity. Starting with conventional notions of filtering theory, in terms of difference-differential models, the research proceeds to notions and constructions of functional analysis convenient for analysing linear filtering problems. Many novel results on filtering theory are also introduced.

Laurent MAZLIAK, Pierre PRIOURET, Paolo BALDI. — **Martingales et chaînes de Markov.** — Collection Méthodes. — Un vol. broché, 15×22, de VIII, 215 p. — ISBN 2-7056-6382-7. — Prix: FF 180.00. — Hermann, Paris, 1998.

Cet ouvrage a pour origine le cours de processus aléatoires de la maîtrise de mathématiques de l'Université Pierre-et-Marie-Curie (Paris VI). Il contient de nombreux exercices et problèmes sur les martingales et les chaînes de Markov à temps discret, corrigés de manière détaillée. Chaque chapitre est précédé de substantiels rappels de cours incluant la plupart du temps des démonstrations. Les problèmes apportent des compléments permettant au lecteur d'approfondir ses connaissances en abordant des résultats plus avancés de la théorie. Cet ouvrage est principalement destiné aux étudiants de deuxième cycle et aux candidats à l'agrégation.

Michel WEBER. — **Entropie métrique et convergence presque partout.** — Travaux en cours, vol. 58. — Un vol. broché, 17×24, de 150 p. — ISBN 2-7056-6381-9- — Prix: FF 180.00. — Hermann, Paris, 1998.

L'interaction fructueuse entre la théorie des probabilités et la théorie ergodique, amorcée par Stein et surtout, plus récemment, par Bourgain et Talagrand, exploite efficacement des méthodes d'entropie métrique appartenant à la théorie des processus stochastiques. L'auteur apporte une présentation, un commentaire et des démonstrations détaillées des critères d'entropie métrique de Bourgain ainsi que des siens propres, d'un point de vue probabiliste. Les outils gaussiens mis en œuvre, ainsi que les propriétés fondamentales des processus gaussiens, sont présentés de façon claire et accessible pour le lecteur ergodicien non spécialiste des processus gaussiens.

G. George YIN, Qing ZHANG. — **Continuous-time Markov chains and applications: a singular perturbation approach.** — Applications of mathematics, vol. 37. — Un vol. relié, 16,5×24,5, de XV, 349 p. — ISBN 0-387-98244-2. — Prix: DM 118.00. — Springer, New York, 1998.

This book discusses continuous-time Markov chains and applications. Using a singular perturbation approach, it presents a systematic treatment of singularly perturbed systems that naturally arise in queueing theory, control and optimization, and manufacturing systems. It gathers a number of ideas in Markov chains and singular perturbations that are scattered hroughout the literature. It presents results on asymptotic expansions of the corresponding probability distributions, functional occupation measures, exponential upper bounds, and asymptotic normality. The emphasis is on Markov chains with weak and strong interactions and structural properties.

Statistique

A.A. BOROVKOV. — **Mathematical statistics.** — Transl. from the Russian by A. Moullagaliev. — Un vol. relié, 19×26, de XXI, 570 p. — ISBN 90-5699-018-7. — Prix: £89.00. — Gordon and Breach Science Publishers, Amsterdam, 1998.

The author presents classical results and methods which form the basis of modern statistics, and examines the foundations of estimation theory, hypothesis testing theory, and statistical game theory. He goes on to consider statistical problems for two or more samples, and those in which observations are taken from different distributions. Methods of finding optimal and asymptotically optimal statistical procedures are given, along with treatments of homogeneity testing, regression, variance analysis, and pattern recognition. The author also posits a number of methodological improvements which simplify proofs, and brings together a number of new results which have never before been published in a single monograph. This monograph, by an acknowledged world leader in the field, combines maximum clarity with mathematical rigor.

Françoise COUTY, Jean DEBORD, Daniel FREDON. — **Probabilités et statistiques: résumés de cours et 157 exercices et problèmes corrigés.** — Sciences supérieures. Mathématiques. — Un vol. broché, 14×22, de 207 p. — ISBN 2-10-004240-8. — Prix: FF 98.00. — Dunod, Paris, 1999.

Ce livre est destiné en priorité aux étudiants des premiers cycles biologiques, médicaux ou agricoles (DEUG SV et ST, PCEM, Pharmacie, IUT, BTS...), mais d'une manière plus générale, à tous ceux qui utilisent des statistiques en biologie. Trois parties composent cet ouvrage: d'abord la statistique descriptive, ensuite le calcul des probabilités, enfin, au carrefour de ces deux domaines, les lois statistiques, l'échantillonnage et l'estimation. Les tables numériques sont données en annexe. Des rappels de cours procurent sous une forme concise les définitions et les formules qu'il faut connaître. Ils sont accompagnés de 157 exercices et problèmes, originaux ou bien tirés de sujets d'examens et tous corrigés.

Gary J. ERICKSON, Joshua T. RYCHERT and C. Ray SMITH, (Editors). — **Maximum entropy and Bayesian methods: Boise, Idaho, U.S.A., 1997.** — Proceedings of the 17th International Workshop on Maximum Entropy and Bayesian Methods of Statistical Analysis. — Fundamental theories of physics, vol. 98. — Un vol. relié, 16.5×24.5, de IX, 297 p. — ISBN 0-7923-5047-2. — Prix: Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1998.

This volume contains a wide range of applications of Bayesian statistics and maximum entropy methods to problems of concern in such fields as image processing, coding theory, machine learning, economics, data analysis and various other problems. It is a compendium of papers by the leading researchers in the field of Bayesian statistics and maximum entropy methods and represents the latest developments in the field.

Ioannis KARATZAS, Steven E. SHREVE. — **Methods of mathematical finance.** — Applications of mathematics: stochastic modelling and applied probability, vol. 39. — Un vol. relié, 16.5×24.5, de XV, 407 p. — ISBN 0-387-94839-2. — Prix: DM 129.00. — Springer, New York, 1998.

This book is the sequel to *Brownian Motion and Stochastic Calculus* by the same authors. Within the context of Brownian-motion-driven asset prices, it develops contingent claim pricing and optimal consumption/investment in both complete and incomplete markets. The latter topic is extended to a study of equilibrium, providing conditions for the existence and uniqueness of market prices which support trading by several heterogeneous agents. Although much of the incomplete-market material is available in research papers, these topics are treated for the first time in a unified manner. The book contains an extensive set of references and notes describing the field, including topics not treated in the text.

Chap T. LE. — **Applied categorical data analyis.** — Wiley series in probability and statistics, Texts and references section. — Un vol. broché, 15.5×23.5, de XI, 287 p. — ISBN 0-471-24060-5. — Prix: £50.00. — John Wiley and Sons, Inc., New York, 1998.

This self-contained volume provides up-to-date coverage of all major methodologies in the area of applied statistics and acquaints the reader with statistical thinking as expressed through a variety of modern-day topics and techniques. The book introduces a number of new research areas, including the Mantel-Haenszel method, Kappa statistics, ordinal risks, odds ratio estimates, goodness-of-fit, and various regression models for categorical data. The author presents his information in a user-friendly format and an accessible style while purposefully keeping the mathematics to a level appropriate for students in applied fields. The book is well supplemented with helpful graphs and tables.

Michel NOVI. — **Pourcentages et tableaux statistiques.** — Que sais-je?, vol. 3337. — Un vol. broché, 11,5×18, de 126 p. — ISBN 2-13-048880-3. — Prix: FF 42.00. — Presses universitaires de France, Paris, 1998.

Cet ouvrage traite des pourcentages en analyse statistique. Il se consacre aux méthodes descriptives et les présente par complexité croissante, le seul outil requis demeurant la règle de trois. L'étude et la mesure de l'association font l'essentiel de ce livre qui s'adresse à tous publics, mais en particulier aux étudiants des disciplines pour lesquelles l'usage des échelles nominales est intensif. En se limitant au niveau descriptif, ce livre ne requiert aucun bagage mathématique.

A.W. VAN DER VAART. — **Asymptotic statistics.** — Cambridge series in statistical and probabilistic mathematics. — Un vol. relié, 18,5×26, de xv, 443 p. — ISBN 0-521-49603-9. — Prix: £40.00. — Cambridge University Press, Cambridge, 1998.

This book is an introduction to the field of asymptotic statistics. In addition to most of the standard topics of an asymptotics course, including likelihood inference, M-estimation, asymptotic efficiency, U-statistics, and rank procedures, the book also presents recent research topics such as semiparametric models, the bootstrap, and empirical processes and their applications. One of the unifying themes is the approximation by limit experiments. This entails mainly the local approximation of the classical i.i.d. set-up with smooth parameters by location experiments involving a single, normally distributed observation. Thus, even the standard subjects of asymptotic statistics are presented in a novel way.

Analyse numérique

Zhongying CHEN, Charles A. MICCHELI, Yuesheng XU, (Editors). — **Advances in computational mathematics.** — Proceedings of the Guangzhou International Symposium. — Pure and applied mathematics, vol. 202. — Un vol. broché, 18×25,5, de xx, 604 p. — ISBN 0-8247-1946-8. — Prix: US$175.00. — Marcel Dekker, Inc., New York, 1998.

The Guangzhou International Symposium on Computational Mathematics was held at Zhongshan University, Guangzhou, People's Republic of China, in 1997. Reporting on topics ranging from numerical linear algebra to signal and image processing, this book addresses computational approximation, numerical solutions of differential and integral equations, inverse and ill-posed problems, and geometric modeling; presents a new class of Jacobi polynomials orthogonal with respect to certain varying weights; applies eigenstate preserving schemes to center manifolds and Hopf and torus bifurcations; constructs cubature formulas for the unit sphere in $\mathbf{R}^n$ that have almost equal weights.

P.G. CIARLET, J.L. LIONS. — **Handbook of numerical analysis, vol. 6: Numerical methods for solids (part 3), Numerical methods for fluids (part 1).** — Un vol. relié, 17,5×24,5, de x, 689 p. — ISBN 0-444-82569-X. — Prix: Dfl. 285.00. — Elsevier, Amsterdam, 1998.

This series of volumes covers all the major aspects of numerical analysis, serving as the basic reference work on the subject. Each volume concentrates on one to three particular topics.