Probabilités et processus stochastiques

Probabilités et processus stochastiques

Sasha CYGANOWSKI, Peter KLOEDEN, Jerzy OMBACH. — **From elementary probability to stochastic differential equations with MAPLE®.** — Universitext. — Un vol. broché, 15,5×23,5, de XVI, 310 p. — ISBN 3-540-42666-3. — Prix: € 39.95. — Springer, Berlin, 2002.

The book is based on measure theory which is introduced as smoothly as possible. It is intended for advanced undergraduate students or graduates, not necessarily in mathematics, providing an overview and intuitive background for more advanced studies as well as some practical skills in the use of MAPLE in the context of probability and applications. Although this book contains definitions and theorems, it differs from conventional mathematics books in its use of MAPLE worksheets instead of formal proofs to enable the reader to gain an intuitive understanding of the ideas under concern. As prerequisites the authors assume a familiarity with basic calculus and linear algebra, as well as with elementary ordinary differential equations and, in the final chapter, simple numerical methods for such ODEs.

John HAIGH. — **Probability models.** — Springer undergraduate mathematics series. — Un vol. broché, 23,5×17, de VIII, 256 p. — ISBN 1-85233-431-2. — Prix: € 29.95. — Springer, London, 2002.

The book is designed to aid students studying probability as part of an undergraduate course on mathematics or mathematics and statistics. It describes how to set up and analyze models of real-life phenomena that involve elements of chance. Motivation comes from everyday experiences of probability via dice and cards, the idea of fairness in games of chance, and the random ways in which, say, birthdays are shared or particular events arise. Applications include branching processes, random walks, Markov chains, queues, renewal theory, and Brownian motion.

David POLLARD. — **A user's guide to measure theoretic probability.** — Cambridge series in statistical and probabilistic mathematics. — Un vol. broché, 18×25,5, de XIII, 351 p. — ISBN 0-521-00289-3 (relié: 0-521-80242-3). — Prix: £20.95 (relié: £60.00). — Cambridge University Press, Cambridge, 2002.

This book grew from a need to teach a rigorous probability course to a mixed audience – statisticians, mathematically inclined biostatisticians, economists, and students of finance – at the advanced undergraduate/introductory graduate level, without the luxury of a course in measure theory as a prerequisite. The core of the book covers the basic topics of independence, conditioning, martingales, convergence in distribution, and Fourier transforms. In a further break with tradition, the necessary measure theory is developed via the identification of integrals with linear functionals on spaces of measurable functions, allowing quicker access to the full power of the measure theoretic methods.

Kazimierz SOBCZYK, David J. KIRKNER. — **Stochastic modeling of microstructures.** — Modeling and simulation in science. Engineering and technology. — Un vol. relié, 16×24, de VIII, 270 p. — ISBN 0-8176-4233-1. — Prix: SFr. 158.00. — Birkhäuser, Boston, 2001.

This book presents the language of random field theory and the principles of stochastic geometry in order to give the systematic and concise knowledge necessary for modeling real random heterogeneous media. — *Features:* First comprehensive introduction to the comparatively new field of stochastic modeling of material microstructures. – Presentation of basic tools required from the diverse subjects of random field theory, stochastic geometry and spatial statistics. – Provides background concepts from probability theory and stochastic processes. –

Applications from various fields are discussed, including stochastic wave propagation and the mechanics of porous media flow. – Clear and integrated exposition guides the reader from the basics through problems of contemporary interest.

Statistique

Joseph G. IBRAHIM, Ming-Hui CHEN, Debajyoti SINHA. — **Bayesian survival analysis.** — Springer series in statistics. — Un vol. relié, 17×24, de XIV, 479 p. — ISBN 0-387-95277-2. — Prix : € 79.95. — Springer, New York, 2001.

This book provides a comprehensive treatment of Bayesian survival analysis. Several topics are addressed, including parametric models, semiparametric models based on prior processes, proportional and non-proportional hazards models, frailty models, cure rate models, model selection and comparison, joint models for longitudinal and survival data, models with time varying covariates, missing covariate data... etc. Also various censoring schemes are examined including right and interval censored data. Several additional topics are discussed, including noninformative and informative prior specifications, computing posterior quantities of interest, Bayesian hypothesis testing, variable selection, model selection with nonnested models... etc. The book presents a balance between theory and applications, and for each class of models discussed, detailed examples and analyses from case studies are presented whenever possible.

Analyse numérique

James F. BLOWEY, John P. COLEMAN, Alan W. CRAIG, (Editors). — **Theory and numerics of differential equations: Durham 2000.** — Universitext. — Un vol. relié, 17×24, de X, 280 p. — ISBN 3-540-41846-6. — Prix : € 49.95. — Springer, Berlin, 2001.

This book contains detailed lecture notes on five topics at the forefront of current research in numerical analysis and applied mathematics. Each set of notes presents a self-contained guide to a current research area and has an extensive bibliography. In addition, most of the notes contain detailed proofs of the key results. Current (unsolved) problems are also described and directions for future research are given. The book is suitable for first year graduate students in applied mathematics and for professional mathematicians.

P.G. CIARLET, J.L. LIONS, (Editors). — **Handbook of numerical analysis, vol. 8: Solution of equations in $\mathbf{R}^n$ (part 4), Techniques of scientific computing (part 4), Numerical methods for fluids (part 2).** — Un vol. relié, 17×24,5 de XII, 661 p. — ISBN 0-444-50906-2. — Prix : € 125.00. — North-Holland, Elsevier, Amsterdam, 2002.

Solution of equations in $\mathbf{R}^n$ (part 4): Computational methods for large eigenvalue problems (H.A. van der Vorst). – Techniques of scientific computing (part 4): Theoretical and numerical analysis of differential-algebraic equations (P.J. Rabier, W.C. Reinboldt). – Numerical methods for fluids (part 2): Mathematical modeling and analysis of viscoelastic fluids of the Oldroyd kind (E. Fernández-Cara, F. Guillén, R.R. Ortega).

Alexandre ERN, Jean-Luc GUERMOND. — **Éléments finis: théorie, applications, mise en œuvre.** — Mathématiques & applications, vol. 36. — Un vol. broché, 23 ×15,5, de IX, 430 p. — ISBN 3-540-42615-9. — Prix : € 71.04. — Springer, Paris, 2002.

Ces notes de cours (École Nationale des Ponts et Chaussées, DEA de Mécanique de Paris VI) présentent la méthode des éléments finis dans un cadre mathématique rigoureux. Le contenu