Applications

Data Envelopment Analysis
Theory and Techniques for Economics and Operations Research

Subhash C. Ray, *University of Connecticut*

Using the neo-classical theory of production economics as the analytical framework, this book provides a unified and easily comprehensible, yet fairly rigorous, exposition of the core literature on data envelopment analysis (DEA) for readers based in different disciplines. The book also covers several forms of stochastic DEA in detail.

2004 228 x 152 mm 368pp 48 line diagrams 49 tables
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Ecological Inference

Edited by Gary King, *Harvard University*
Martin A. Tanner, *Northwestern University*
Ori Rosen, *University of Pittsburgh*

The uncertainties and information lost in aggregation make ecological inference one of the most difficult areas of statistical inference, but these inferences are required in many academic fields, as well as by legislatures and the Courts in redistricting, marketing research by business, and policy analysis by governments. This wide-ranging collection of essays offers many fresh and important contributions to the study of ecological inference.

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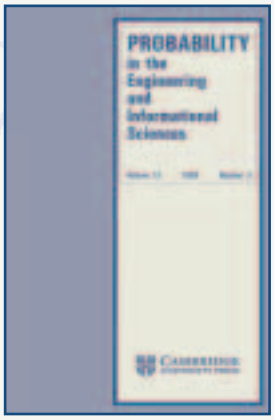

Probability in the Engineering and Informational Sciences

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May 2004

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Statistics and Probability 2004

Highlights

Understanding Probability
TEXTBOOK

Chance Rules of Everyday Life

Henk Tijms, *Vrije Universiteit, Amsterdam*

Mastering the concepts of probability can cast new light on situations where randomness and chance appear to rule. In this book, which uses lotteries and casino games to provide lots of examples, the author demystifies much of probability theory, including betting systems, the central limit theorem and the Bayesian approach. Written with wit and clarity, this book is for anyone who is not put off by a few numbers and some high-school algebra. It is also ideally suited to students of all disciplines taking their first course in probability.

Contents: Part I. Probability in Action: 1. Probability questions; 2. The law of large numbers and simulation; 3. Probabilities in everyday life; 4. Rare events and lotteries; 5. Probability and statistics; 6. Chance trees and Bayes' rule; Part II: 7. Foundations of probability theory; 8. Conditional probability and Bayes; 9. Basic rules for discrete random variables; 10. Continuous random variables; 11. Jointly distributed random variables; 12. Multivariate normal distribution; 13. Conditional distributions; 14. Generating functions.

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Dicing with Death

Chance, Risk and Health

Stephen Senn, *University of Glasgow*

'… thought provoking and rewarding … whether your taste is for the nitty-gritty of controversies, like the alleged link between childhood MMR vaccination and autism, or for pensive reflection on the philosophy of knowledge, you will find much of value here.'

New Scientist

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An Introduction to Financial Option Valuation
TEXTBOOK

Mathematics, Stochastics and Computation

Desmond J. Higham *University of Strathclyde*

This is a lively textbook providing a solid introduction to financial option valuation for undergraduate students armed with a working knowledge of first year calculus. No prior background in probability, statistics or numerical analysis is required. Each chapter comes complete with accompanying stand-alone MATLAB code listing to illustrate a key idea. Furthermore, the author has made great use of figures and examples, and has included computations based on real stock-market data.

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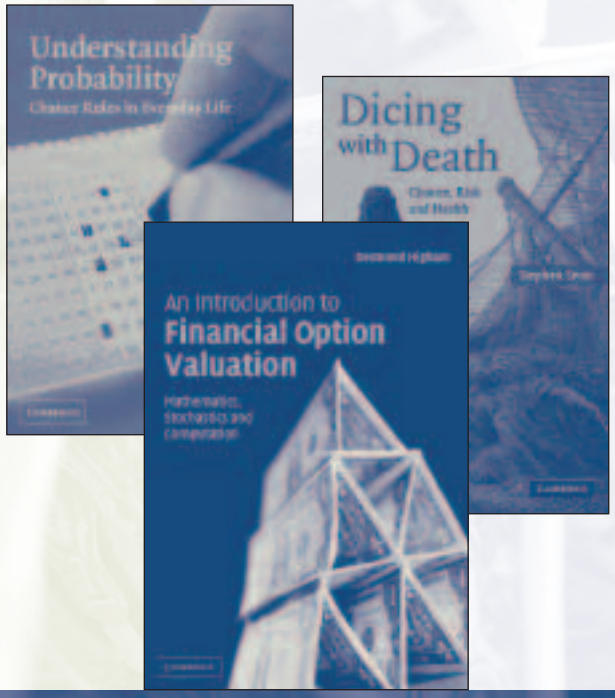

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Theory and Methods

Multivariate t-Distributions and Their Applications

Samuel Kotz, *George Washington University, Washington DC*
and Saralees Nadarajah, *University of South Florida*

Almost all the results available in the literature on multivariate t-distributions published in the last 50 years are now collected together in this comprehensive reference. Much of this material has never before appeared in book form. The material on estimation and regression models is of special value for practitioners in statistics and economics. A comprehensive bibliography of over 350 references is included.

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Bayesian Logical Data Analysis for the Physical Sciences

Phil Gregory, *University of British Columbia, Vancouver*

Increasingly, researchers in many branches of science are coming into contact with Bayesian statistics or Bayesian probability theory. This book provides a clear exposition of the underlying concepts with large numbers of worked examples and problem sets. Background material is provided in appendices and supporting Mathematica notebooks are available. Suitable for upper-undergraduate, graduate students, or any serious researcher in physical sciences or engineering.

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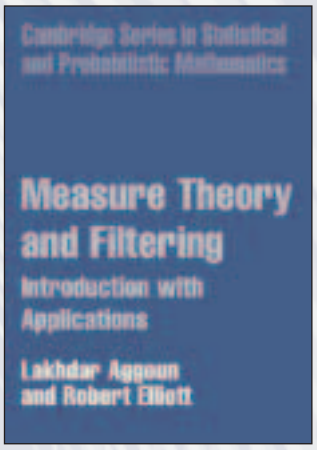
Introduction with Applications



Lakhdar Aggoun, *Sultan Qaboos University, Oman*
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Provides an excellent user's guide to filtering: basic theory is followed by a thorough treatment of Kalman filtering, including recent results which extend the Kalman filter to provide parameter estimates. These ideas are then applied to problems arising in finance, genetics and population modelling in three separate chapters, making this a comprehensive resource for both practitioners and researchers.

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David Applebaum, *Nottingham Trent University*

Lévy processes form a wide and rich class of random processes, and have many applications ranging from physics to finance. Stochastic calculus is the mathematics of systems interacting with random noise. For the first time in a book, Applebaum ties the two subjects together. The book introduces all the tools that are needed for the stochastic approach to option pricing, including Itô's formula, Girsanov's theorem and the martingale representation theorem.

Cambridge Studies in Advanced Mathematics, 93

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Statistical Analysis of Stochastic Processes in Time

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J. K. Lindsey, *Université de Liège, Belgium*

Much theoretical work has been done on stochastic processes, but virtually no modern books are available to show how the results can be applied. This book fills that gap by introducing practical methods of applying stochastic processes to an audience knowledgeable only in basic statistics. The book features a range of examples arising from areas including sociology, medicine and engineering. Complementing these are exercise sets making the book ideal for introductory courses in stochastic processes. Software (available from www.cambridge.org) is provided for the freely available R system for the reader to apply to all the models presented.

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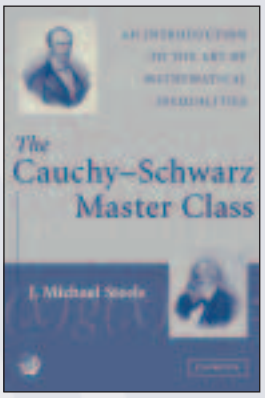
The Cauchy-Schwarz Master Class



J. Michael Steele, *University of Pennsylvania*

Using the Cauchy-Schwarz inequality as a guide, the author presents a fascinating collection of problems related to inequalities and coaches readers through solutions. Undergraduate and beginning graduate students in mathematics, theoretical computer science, statistics, engineering, and economics will find the book perfect for self-study or as a supplement to probability and analysis courses.

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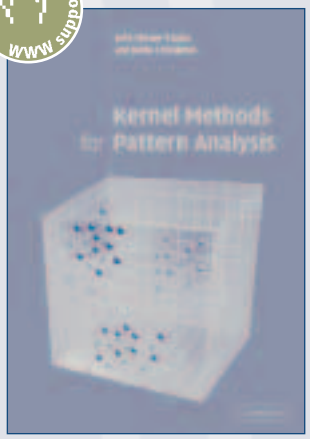
Kernel Methods for Pattern Analysis

GRADUATE TEXTBOOK



John Shawe-Taylor, *University of Southampton*
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Kernel methods provide a powerful and unified framework for pattern discovery, motivating algorithms that can act with application areas ranging from neural networks and pattern recognition to machine learning and data mining. This book provides practitioners with a large toolkit of ready-to-use algorithms, kernels and solutions, and gives an easy introduction for students and researchers to the growing field of kernel-based pattern analysis

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Enzo Olivieri, *Università degli Studi di Roma 'Tor Vergata'*
and Maria Eulalia Vares, *Centro Brasileiro de Pesquisas Fisicas, Brasil*

Provides a general introduction to the theory of large deviations and a wide overview of the metastable behaviour of stochastic dynamics. With only minimal prerequisites, the book covers all the main results and brings the reader to the most recent developments. Written to be accessible to graduate students, this book provides an excellent route into contemporary research.

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Applications

Convex Optimization

GRADUATE TEXTBOOK

Stephen Boyd,
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Convex optimization problems arise frequently in many different fields. The focus of the book is on recognizing convex optimization problems and then finding the most appropriate technique for solving them. The many worked examples and homework exercises and will appeal to students, researchers and practitioners in fields such as engineering, computer science, mathematics, statistics, finance, and economics.

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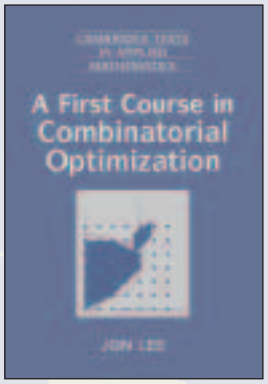
A First Course in Combinatorial Optimization

GRADUATE TEXTBOOK

Jon Lee, *IBM T J Watson Research Center, New York*



This is an ideal text for a one-semester introductory graduate-level course for students of operations research, mathematics, and computer science. Central to the exposition is the polyhedral viewpoint, which is the key principle underlying the successful integer-programming approach to combinatorial-optimization problems. Problems and exercises are included throughout as well as references for further study.

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J. V. Wall, *University of Oxford*
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