

Textbooks in Probability & Statistics 2011

FUNCTIONAL ESTIMATION FOR DENSITY, REGRESSION MODELS AND PROCESSES

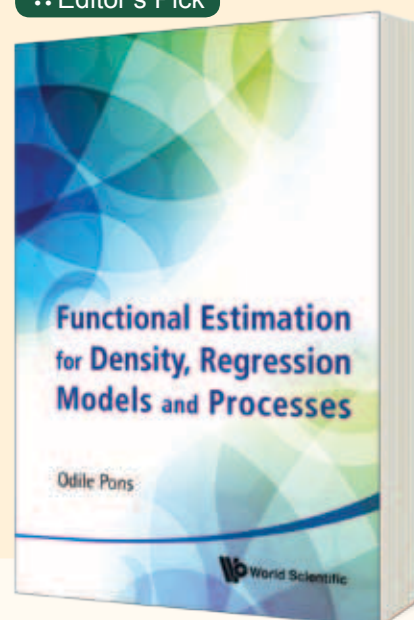
by **Odile Pons** (INRA, France)

This book presents a unified approach on nonparametric estimators for models of independent observations, jump processes and continuous processes. New estimators are defined and their limiting behavior is studied. From a practical point of view, the book expounds on the construction of estimators for functionals of processes and densities, and provides asymptotic expansions and optimality properties from smooth estimators.

Contents: Introduction; Kernel Estimator of a Density; Kernel Estimator of a Regression Function; Limits for the Varying Bandwidths Estimators; Nonparametric Estimation of Quantiles; Nonparametric Estimation for Stochastic Processes; Estimation in Semi-Parametric Regression Models; Diffusions Processes; Applications to Time Series.

200pp Mar 2011
978-981-4343-73-2 US\$75 £49

:: Editor's Pick



RANDOM FIELDS

Analysis and Synthesis

Revised and Expanded New Edition

by **Erik Vanmarcke** (Princeton University, USA)

Review of the First Edition:

"Random Fields is a book which I found both technically interesting and a pleasure to read ... The presentation is clear and the book should be useful to almost anyone who uses random processes to solve problems in engineering or science ... I was particularly impressed with ... the emphasis on utility and the importance of local averages ... It is also refreshing to read a work on stochastic processes where the author emphasizes that microscopic variations may be of no practical interest to the problem at hand!"

David J Thomson

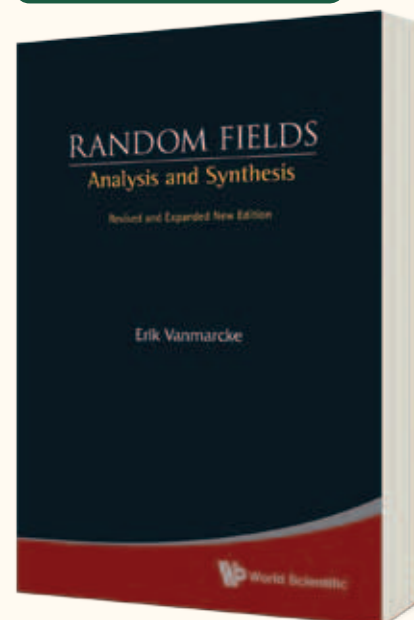
Bell Laboratories, New Jersey, USA, in EOS (American Geophysical Union)

This volume, a revised and expanded edition of an acclaimed book first published by the MIT Press, offers a synthesis of methods to describe and analyze and, where appropriate, predict and control random fields.

Contents: Introduction; Fundamentals of Analysis of Random Fields; Second-Order Analysis of Homogeneous Random Fields; Spectral Parameters, Level Crossings, and Extremes; Local Average Processes on the Line; Two-Dimensional Local Average Processes; Multi-Dimensional Local Average Processes; Overview of Findings.

364pp Jul 2010
978-981-256-297-5 US\$85 £53
978-981-256-353-8(pbk) US\$48 £30

:: Highly Recommended



ABOUT ERIK VANMARCKE

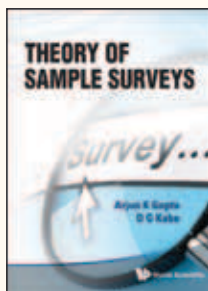
Professor Erik VanMarcke, based in Department of Civil and Environmental Engineering, Princeton University, has published around 200 professional papers and reports, and two books. His major research interests are: stochastic systems and random media; risk assessment and management; earthquake and extreme-wind risks; geologic hazards and probabilistic site characterization; structural safety; random vibrations; random field theory and applications to engineering, geophysics and, lately, origins of cosmic structure.



THEORY OF SAMPLE SURVEYS

by **Arjun K Gupta** (Bowling Green State University, USA) & **D G Kabe** (St Mary's University, Canada)

This book is the culmination of the lecture notes developed by the authors. The approach is theoretical in the sense that it gives mathematical proofs of the results in sample surveys. Intended as a textbook for a one-semester course for undergraduate seniors or first-year graduate students, a prerequisite basic knowledge of algebra, calculus, and statistical theory is required to master the techniques described in this book.



Contents: Simple Random Sampling; Sampling with Varying Probabilities of Selection; Stratified Sampling; Systematic Sampling; Ratio Method of Estimation; Regression Method of Estimation; Cluster Sampling; Sub-Sampling Two-Stage and Three-Stage Sampling; Double Sampling; Non-Sampling Errors.

236pp Feb 2011
978-981-4322-47-8 US\$58 £36

Advanced Series on Statistical Science and Applied Probability – Vol. 13

CHANGE OF TIME AND CHANGE OF MEASURE

by **Ole E Barndorff-Nielsen** (Aarhus University, Denmark) & **Albert Shiryaev** (Steklov Mathematical Institute, Russia & Moscow State University, Russia)

This book provides a comprehensive account of two topics that are of particular significance in both theoretical and applied stochastics: random change of time and change of probability law.



Contents: Random Change of Time; Integral Representations and Change of Time in Stochastic Integrals; Semimartingales: Basic Notions, Structures, Elements of Stochastic Analysis; Stochastic Exponential and Stochastic Logarithm. Cumulant Processes; Processes with Independent Increments. Lévy Processes; Change of Measure. General Facts; Change of Measure in Models Based on Lévy Processes; Change of Time in Semimartingale Models and Models Based on Brownian Motion and Lévy Processes; Conditionally Gaussian Distributions and Stochastic Volatility Models for the Discrete-time Case; Martingale Measures in the Stochastic Theory of Arbitrage; Change of Measure in Option Pricing; Conditionally Brownian and Lévy Processes. Stochastic Volatility Models.

324pp Nov 2010
978-981-4324-47-2 US\$70 £43

INCOMPLETE BLOCK DESIGNS

by **Aloke Dey** (Indian Statistical Institute, New Delhi, India)

This book presents a systematic, rigorous and comprehensive account of the theory and applications of incomplete block designs. All major



Contents: Introduction; Analysis and Properties of Block Designs; Balanced Designs; Partially Balanced Designs; More Incomplete Block Designs; Optimality Aspects of Block Designs.

288pp Aug 2010
978-981-4322-68-3 US\$74 £46

Imperial College Press Optimization Series – Vol. 1

MOMENTS, POSITIVE POLYNOMIALS AND THEIR APPLICATIONS

by **Jean Bernard Lasserre** (LAAS-CNRS & Institute of Mathematics, University of Toulouse, France)

“Beginners in areas related to optimization theory, such as control theory, statistics, mathematical finance, computer science, numerical analysis or even mathematical physics can use the monograph by Lasserre as a textbook, finding there all necessary steps for entering into this new fascinating territory...”

Mihai Putinar

University of California at Santa Barbara, USA

Contents: Moments and Positive Polynomials: The Generalized Moment Problem; Positive Polynomials; Moments; Algorithms for Moment Problems; **Applications:** Global Optimization over Polynomials; Systems of Polynomial Equations; Applications in Probability; Markov Chains Applications; Application in Mathematical Finance; Application in Control; Convex Envelope and Representation of Convex Sets; Multivariate Integration; Min-Max Problems and Nash Equilibria; Bounds on Linear PDE.

384pp Oct 2009
978-1-84816-445-1 US\$85 £58

A MATHEMATICAL BRIDGE

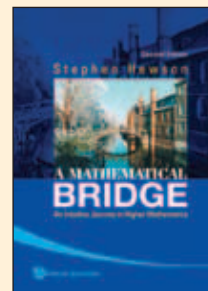
An Intuitive Journey in Higher Mathematics
Second Edition

by **Stephen Hewson** (Cambridge University, UK)

“This nice book helps to bridge the gap between the high school and college mathematics and is warmly recommended to the readers starting the first year university-level mathematics.”

Zentralblatt MATH

Contents: Mathematics; Numbers; Analysis; Algebra and Geometry; Calculus and Differential Equations; Probability; Theoretical Physics; **Appendices:** The Historical Development of Mathematics; Great Mathematicians and Their Achievements; Exercises for the Reader; Basic Mathematical Background; Further Reading; Dictionary of Symbols.



672pp Jan 2009
978-981-283-407-2 US\$110 £61
978-981-283-408-9(pbk) US\$65 £36

Series on Concrete and Applicable Mathematics – Vol. 2

PROBLEMS IN PROBABILITY

by **T M Mills** (La Trobe University, Australia)

“An excellent book, which should be in all libraries, and on the shelf of all instructors teaching courses in mathematical probability at the undergraduate or graduate level.”

MAA Online Book Review

The notes and problems in this book have been designed to provide a basis for a series of lectures suitable for advanced undergraduate students on the subject of probability. A key feature of the book is that many problems are in fact small guided research projects. The research work involved in solving the problems will enhance the student's library research skills.

Contents: Sets, Measure and Probability; Elementary Probability; Discrete Random Variables; Continuous Random Variables; Limit Theorems; Random Walks.

192pp Nov 2001
978-981-02-4598-6 US\$43 £30

Notable Titles

LECTURES ON WHITE NOISE FUNCTIONALS

by **T Hida** (Meijo University, Japan) &
Si Si (Aichi Prefectural University, Japan)

"This monograph is a valuable guide to the world of white noise analysis originated by Hida. It is full of ideas, essentials and philosophy about why analysis based upon the white noise is needed, what the white noise functionals are, how to handle stochastic processes on an applicational basis to quantum physics, how to find a natural way to formulate the infinite-dimensional harmonic analysis, etc. This book is recommendable not only to ambitious graduate students in probability or applied analysis in a broad sense, but also to researchers who work on infinite-dimensional analysis or mathematical physics, as well as to any readers who are interested in white noise analysis."

Mathematical Reviews

280pp Jul 2008
978-981-256-052-0 US\$121 £83

INTRODUCTION TO STOCHASTIC CALCULUS WITH APPLICATIONS

Second Edition

by **Fima C Klebaner** (Monash University, Australia)

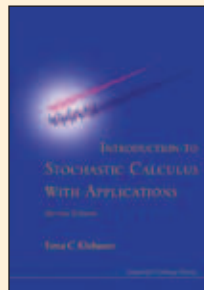
Review of the First Edition:

"... hard to find books on stochastic analysis which present such a wide spectrum of results with relatively modest prerequisites."

Mathematical Reviews

Contents: Preliminaries from Calculus; Concepts of Probability Theory; Basic Stochastic Processes; Brownian Motion Calculus; Stochastic Differential Equations; Diffusion Processes; Martingales; Calculus for Semimartingales; Pure Jump Processes; Change of Probability Measure; Applications in Finance: Stock and FX Options; Applications in Finance: Bonds, Rates and Options; Applications in Biology; Applications in Engineering and Physics.

432pp Jun 2005
978-1-86094-555-7 US\$85 £52
978-1-86094-566-3(pbk) US\$51 £29

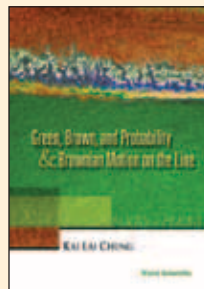


GREEN, BROWN, AND PROBABILITY AND BROWNIAN MOTION ON THE LINE

by **Kai Lai Chung** (Stanford University, USA)

Contents: Green, Brown, and Probability: Green's Ideas; Probability and Potential; Process; Random Time; Markov Property; Brownian Construct; The Trouble with Boundary; Return to Green; Strong Markov Property; Transience; Last but Not Least; Least Energy; **Brownian Motion on the Line:** Exit and Return; Time and Place; A General Method; Drift; Dirichlet and Poisson Problems; Feynman–Kac Functionals; **Stopped Feynman–Kac Functional:** Introduction; The Results; The Connections.

180pp May 2002
978-981-02-4689-1 US\$61 £42
978-981-02-4690-7(pbk) US\$23 £16



STATISTICAL METHODS OF ANALYSIS

by **Chin Long Chiang** (University of California, Berkeley, USA)

"It offers a sound presentation of concepts at either the undergraduate or first-year graduate level, including a moderate amount of calculus ... A resulting strength of the text is that students are presented with a deeper understanding of analytic methods."

Journal of the American Statistical Association

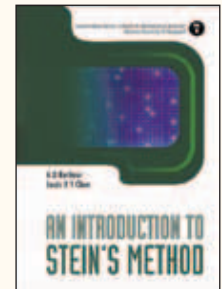
656pp Oct 2003
978-981-238-309-9 US\$111 £76
978-981-238-310-5(pbk) US\$58 £40

Lecture Notes Series, Institute for Mathematical Sciences, National University of Singapore

AN INTRODUCTION TO STEIN'S METHOD Vol. 4

by **A D Barbour** (University of Zürich, Switzerland) &
Louis HY Chen (National University of Singapore, Singapore)

"All the lectures have been given by eminent experts working in the area of Stein's method and provide details and unsolved problems along with a list of very useful references. These lectures will be very valuable for both experts and researchers wishing to explore the powerful approximation method proposed by Charles Stein."



Mathematical Reviews

Contents: Normal Approximation (L H Y Chen & Q-M Shao); Poisson and Compound Poisson Approximation (T Erhardsson); Poisson Process Approximation (A-H Xia); Three General Approaches to Stein's Method (G Reinert).

240pp Apr 2005
978-981-256-280-7 US\$96 £66
978-981-256-330-9(pbk) US\$49 £33

STEIN'S METHOD AND APPLICATIONS Vol. 5

by **A D Barbour** (University of Zürich, Switzerland) &
Louis HY Chen (National University of Singapore, Singapore)

This volume, the proceedings of a workshop held in honour of Charles Stein in Singapore, August 2003, contains contributions from many of the mathematicians at the forefront of this effort.

320pp May 2005
978-981-256-281-4 US\$104 £72

MARKOV CHAIN MONTE CARLO Vol. 7

Innovations and Applications

by **W S Kendall** (University of Warwick, UK),
F Liang (Texas A&M University, USA), &
J-S Wang (National University of Singapore, Singapore)

Contents: Introduction to Markov Chain Monte Carlo Simulations and Their Statistical Analysis (B A Berg); An Introduction to Monte Carlo Methods in Statistical Physics (D P Landau); Notes on Perfect Simulation (W S Kendall); Sequential Monte Carlo Methods and Their Applications (R Chen); MCMC in the Analysis of Genetic Data on Pedigrees (E A Thompson).

240pp Nov 2005
978-981-256-427-6 US\$113 £78

A FIRST LOOK AT RIGOROUS PROBABILITY THEORY

Second Edition

by **Jeffrey S Rosenthal** (University of Toronto, Canada)

"This is a fine textbook on probability theory based on measure theory. The parts of measure theory that are needed are developed within the book and a teacher of measure theory could find them quite useful. The construction of the Lebesgue measure (extension theorem) is unusual and interesting."

Mathematical Reviews

This textbook is an introduction to probability theory using measure theory. It is designed for graduate students in a variety of fields (mathematics, statistics, economics, management, finance, computer science, and engineering) who require a working knowledge of probability theory that is mathematically precise, but without excessive technicalities. The text provides complete proofs of all the essential introductory results. In this new edition, many exercises and small additional topics have been added and existing ones expanded.

Contents: The Need for Measure Theory; Probability Triples; Further Probabilistic Foundations; Expected Values; Inequalities and Convergence; Distributions of Random Variables; Stochastic Processes and Gambling Games; Discrete Markov Chains; More Probability Theorems; Weak Convergence; Characteristic Functions; Decomposition of Probability Laws; Conditional Probability and Expectation; Martingales; General Stochastic Processes.

236pp Nov 2006
978-981-270-370-5 US\$61 £33
978-981-270-371-2(pbk) US\$33 £21

Advanced Series on Statistical Science and Applied Probability – Vol. 6

ELEMENTARY STOCHASTIC CALCULUS, WITH FINANCE IN VIEW

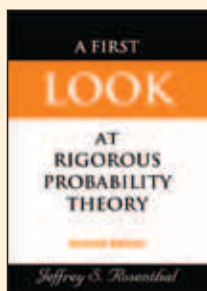
by **Thomas Mikosch** (University of Copenhagen, Denmark)

"This book under review can be determined as a very successful work ... the author's choice of the material is done with good taste and expertise ... It can be strongly recommended to graduate students and practitioners in the field of finance and economics."

Mathematics Abstracts

Contents: Preliminaries: Basic Concepts from Probability Theory; Stochastic Processes; Brownian Motion; Conditional Expectation; Martingales; **The Stochastic Integral:** The Riemann and Riemann–Stieltjes Integrals; The Itô Integral; The Itô Lemma; The Stratonovich and Other Integrals; **Stochastic Differential Equations:** Deterministic Differential Equations; Itô Stochastic Differential Equations; The General Linear Differential Equation; Numerical Solution; **Applications of Stochastic Calculus in Finance:** The Black–Scholes Option-Pricing Formula; A Useful Technique: Change of Measure; **Appendices:** Modes of Convergence; Inequalities; Non-Differentiability and Unbounded Variation of Brownian Sample Paths; Proof of the Existence of the General Itô Stochastic Integral; The Radon–Nikodym Theorem; Proof of the Existence and Uniqueness of the Conditional Expectation.

224pp Oct 1998
978-981-02-3543-7 US\$49 £33



Series on Multivariate Analysis – Vol. 3

MATHEMATICAL METHODS IN SAMPLE SURVEYS

by **Howard G Tucker** (University of California, Irvine, USA)

"The book is well written and could serve as a very good supplement to more traditional courses in mathematical statistics. It could also be recommended to interested students as a supplementary reading."

Mathematical Reviews

This book is suitable for a one year junior-senior level course for mathematics and statistics majors as well as for students in the social sciences who are not handicapped by a fear of proofs in mathematics. It requires no previous knowledge of statistics, and it could actually serve as an introduction to statistics. A sizeable part of the book covers the discrete probability needed for the sampling methods covered.

Contents: Events and Probability; Random Variables; Expectation; Conditional Expectation; Limit Theorems; Simple Random Sampling; Unequal Probability Sampling; Linear Relationships; Stratified Sampling; Cluster Sampling; Two-Stage Sampling.

216pp Oct 1998
978-981-02-2617-6 US\$36 £25

STATISTICS AND TRUTH

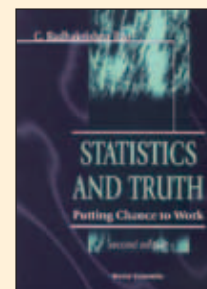
Putting Chance to Work

Second Edition

by **C Radhakrishna Rao** (Pennsylvania State University, USA)

Review of the First Edition:

"The topics discussed in the book range from general philosophical issues, including the nature of creativity, to technical statistical matters. The book is a powerful illustration of the nature of statistical arguments and I can think of no better book to introduce the subject, in particular to a general reader."



Short Book Reviews

Written by one of the top most statisticians with experience in diverse fields of applications of statistics, the book deals with the philosophical and methodological aspects of information technology, collection and analysis of data to provide insight into a problem, whether it is scientific research, policy making by government or decision making in our daily lives.

Contents: Uncertainty, Randomness and Creation of New Knowledge; Taming of Uncertainty — Evolution of Statistics; Principles and Strategies of Data Analysis: Cross Examination of Data; Weighted Distributions — Data with Built-in Bias; Statistics: An Inevitable Instrument in Search of Truth; Public Understanding of Statistics: Learning from Numbers.

212pp Aug 1997
978-981-02-3111-8 US\$52 £36

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