RESEÑAS / BOOK'S REVIEWS

ADVANCES IN MATHEMATICAL FINANCE

Michael C. Fu, Robert A. Jarrow, Ju-Yi J. Yen and Robert J. Elliot, Editors (2007)

Applied and Numerical Harmonic Analysis Series, Birkhäuser ISBN 978-0-8176-4544-1
xxviii+368 64,90€

This book is divided into 3 chapters which cover topics derived from the works of Prof; Dilip B. Madan (PDM). A conference was held at the Norbert Wiener Center of the University of Maryland in the period September 2-October 1 of 2006, with the theme 'Mathematical Finance Conference on the Honor of the 6àth Birthday of Dilip B. Madan'. Essays presented in the conference qre included in the book.

A preface of the editor gives a brief introduction and an account of the contributions of PDM is given
The first part, is devoted to Variance Gamma and Related Stochastic Processes contains 5 contributions. The first paper is due to E. Seneta, The early years of the variance gamma process, accounts the relationship of the author with PDM. The second paper is due to M. C. Fu, Variance –Gamma and the Monte Carlo, is a tutorial on sequential simulation and bridge sampling methods for variance reduction. The third paper, Some remarkable properties of gamma processes of M. Yor, deals with the characterization of gamma processes as certain 0-stable one and studies properties of Brownian and Gamma bridges, space time harmonic function of theme etc. The fourth paper , A note about Selberg' s Integrals in Relation with the Beta-Gamma Algebra, the same author develops probabilistically the results of Selberg. The part is closed with a paper of R.J. Elliot and J. van der Hoek, Itô Formulas for Fractional Brownian Motion, review the ideas of this theory using a white noise theoretically framework and develop a new proof of the formulas.

The second part's theme is Asset and Option Pricing. It begins with the paper titled Asset Price Bubbles in Complete Markets. Its author, R. Jarrow, gives a tutorial on Zero Volatile and Option Adjusted Spread using the so called Heath-Jarrow-Morton model as framework. It is followed by a contribution of X. Jin and F. Milne titled Taxation and Transaction Costs in General Equilibrium Asset Economy, which fixes conditions for the existence of competitive equilibrium for multiperiod economy and how the existence of taxes and transactions can be introduce in the model consistently. The third paper is authored by E. Eberlein and W. Kluge, Calibraton of Lèvy Term Structure Models, considers the facts implied y the relationships among the different approaches used for studying the driving processes, the Lèvy term structure and the Calibration of the Lèvy forward rate model under different modalities. The contribution Pricing of Swaptions in Affine Term Structure with Stochastic Volatility is presented by M. Heidari, A. Hirsa and the honored PDM. The paper presents results that fixed the characteristic function of log swap rate under the Swap measure. They are derived using the fast Fourier transform. Numerical examples illustrate the behavior of the theoretical results. P. Carr and Q; Hirsa present Forward Evolution Equations for Knock-Out Options. They considered the dynamics of jump diffusion models which are additive in the log of price. Partial integro-differential equations for up-and-out and down-and-out call options are derived for describing their behavior. A numerical study is developed. The last paper is due to H. Geman, Mean Reversion Versus Random, Walk in Oil and Natural Gas Prices, tutorials the qualitative properties of the prices of these products in the last 15 years and propose some models for describing their behavior mathematically. Tests are developed or
establishing the existence or not of mean reversion in the market for them.

Part 3 is devoted to the theme Credit Risk and Investments. It begins with the paper of D. C. Brody, L. P. Hugston and A. Marina titled: Beyond Hazard Rates: A New Framework for Credit Risk Modelling. The paper presents a mechanism that characterizes the so called information process model for market filtration. The price process of the bond is derived by calculating the conditional expectation of the payouts. An extension to defautable discount bonds with stochastic recoveries is derived and its dynamic is studied fixing a diffusion equation that describes the corresponding process. Simulations are performed and extra insights, of the behavior of the price process, are obtained. Options are introduced and defaultable bonds formulas are derived. The following paper is due to H. Albrechev , S. A.

Ladoucette and W. Schoutens, it presents the contribution entitled A Generic One Factor Lèvy Model for Pricing Synthetic CDOs. The paper unifies models arising form different distributions proposed previously . The result is a one factor Lèvy model and an approximation for large homogenous portfolios. Some examples as Gaussian, inverse Gaussian shifted-Gamma among them , are worked out .

This book is adequate for those specialists coming from the academy and for practitioners looking for a an overview of results spread from the Variance-Gamma Process derived from Prof. Madan' s work.. The main interest of having this book is motivated by the growing importance these models for describing stochastic processes describing financial data.

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AN INTRODUCTION TO THE THEORY OF POINT PROCESS. VOLUME II. GENERAL THEORY AND STRUCTURE

D. Daley and D. Vere-Jones (2007)

Springer (Probability and its Applications) ISBN: 978-0-387-21337-8
XVI+585 £53,50

This book has 7 chapters and is a revised and updated version of the previous second edition. The first chapter is devoted to the presentation of the basic elements on random measures and of the kernel of the interest: point processes. It provides the prerequisites of knowledge on the theme. It can be used in a course for non specialists. In the next chapter we may obtain a contemporary knowledge on special processes, which are characterized by designing particular classes. It is concerned with the challenges posed by these kinds of processes. The following chapter may be used independently, as a source for delivering a good series of lectures, on convergence theory together with limiting theorems for stochastic processes. The next chapter plays a key role for the non-initiated presenting the theory of stationary point processes. The other chapters deal with important particularities of the theme as Palm Theory, Evolutionary processes, the prediction issues, and the particularities of spatial point processes.

The readers of this book will obtain a modern look to point processes. I recommend it for mathematicians and engineers that have the responsibility of teaching on the subject.

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STUDYING HUMAN POPULATIONS AN ADVANCE COURSE IN STATISTICS

N. T. Longford (2008)

Springer,(Springer Texts in Statistics) ISBN 978-0-387-98735-4
XII+472 £23,50

This is a valuable book for every body involved in social statistics. It poses an emphasis in the main methods involved with the study of social issues an present them having these points of view. Being written in social sciences friendly style makes it more usable than other books in the market. The approach used seems to be good for fitting the minds of the students in how to model their inferential interests. It is a good reference book for researchers for dealing with the abstracts formulations, of real world problems arising in the statistical study of human populations. The author describes several important real-life problems in the area. It is pointed out the importance of merging theoretical thinking with the usual formulation of the social statistics.

The book may be considered as a source for a two-semesters course in the subject for persons going into social statistics. The first chapter presents the basic problems of the Analysis of Variance and Regression models, which is discussed at large using modern formulations and illustrated with interesting applications. The second chapter deals with the theoretical models using Maximum Likelihood methods for estimation and is followed by the counterparts in finite population sampling. The following Chapter is devoted to the study of the Bayesian approach, discussing the different variants. Chapters follow it where a similar discussion is developed for incomplete data, imperfect measurements, Experiments vs. observational studies, clinical trials, and random coefficients. Generalized linear models and the study of longitudinal data including the analysis of Tim series.. The last chapter is very remarkable for the derivation of the intringulis of Meta Analysis. A small set of exercises and examples completes the book.

P. F. White
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MODEL BASED INFERENCE IN THE LIFE SCIENCES. A PRIMER EVIDENCE

D. R. Anderson (2008)

Springer, ISBN 978-0-387-74037-7
XII+190 £48,50

This book poses philosophical issues by considering that multiple working hypotheses making drives life. Hence to use data to represent them is a necessarily good model, if you want to successful deicing making. Therefore, as Science advances by testing hypothesis, a large discussion on this aspect is developed. Of course data provides the information and one must model the generation of them. Hence this issue is also discussed at large. As we deal with information it is clear that the concept its reduction is better explained by information and entropy than by sufficiency. This is another discussion subject. I agree that it is easier to explain a statistical procedure using this definitions to the clients if he is coming form Physical concerned areas. All these lead to the need of having in mind that scientific experimentation provides data, them information and a quantification must be made for using an inferential procedure for filtering the evidence. and inferring using models from set of them conformed by the decision maker. Then the author makes a point that the so called 'mulitmodel inference' should be used.

I enjoyed the book and consider that it fixes some important reflection issues for both statisticians and mainly for the scientists from the Hard Sciences but also for those of the Soft Sciences specially those concerned with the philosophy of the sciences

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INTRODUCTION TO REGRESSION MODELING

Abraham Bovas and Johannes Ledoter (2006)

Thomson Learning ISBN 0-534-4207504
xiv+433 113.95USD

This is another good book for the collection of regression theory oeuvres. After presenting the purposes of the book the basic maximum likelihood estimation method is presented ata large. Then regression is introduced based on Gauss Markov's theorem.. The discussion on the geometry of it in regression is presented, and is pedagogically perfect. Special cases are discussed then. The residual and the influence analysis are developed when presenting model selection methods. Again the exposition of this problematic is very illustrating for the students. They present as model selection tool, not only the usual Backward, Forward and Stepwise methods but also the Mallows-Cp , Akaike information, etc. A chapter is devoted to the study of interesting cases. A good coverage of the different computer packages at hand is provided (mainly Minitab, R, S-Plus and SPSS). It is pity SAS did not received a similar attention along the book. We may consider that 4 chapters are complementary to the usual contents of an undergraduate course. They deal with non linear regression, regression for time series, and the particularities of the treatment of regression for qualitative variables.

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A HISTORY OF ABSTRACT ALGEBRA

Israel Kleiner (2007)

Birkhãuser ISBN 13-978-08176-4684-4 e-ISBN 13-978-08176-4685-1
xiii+168 $49,95

This book presents , through 8 chapters a history of Abstract Algebra. Themes are the conducting discussion line. The history of Classical Algebra, Group Theory , Ring Theory, Field Theory Linear Algebra is the hard core. The contents of chapter 6 is Abstract Algebra, where the presentation is developed using the leading results of Emmy Noether as the overall reference. Chapter 7 gives a proposal for a course on the theme using the book, .perhaps only a part of it, I guess. The 8th chapter is devoted to present a brief biography of the path breaking mathematicians considerd by author as the most important in the foundations of Algebra. He biographied: Arthur Caley, Richard Dedekind, Evariste Galois, Karl F. Gauss, William R. Hamilton and Emmy Noether. They are vivid and concise The lecture of this chapter should be stimulating for students.

H. T. Wong
Smith and King College

STATISTICAL DECISION THEORY. ESTIMATION, TESTING AND SELECTION

F. Liese and K. Miscke (2008)

Springer (Springer Series in Statistics) ISBN 978-0-387-73193-3
X+ 695 £54.00

This should be considered as a graduate book for statisticians, engineers, economists and those involved with decision-making. It assumes some statistical knowledge. A good percent of the book is devoted to how the general decision making structures are implanted into statistical models and procedures and how they conform intellectual frames for dealing effectively with modeling and data analysis.

The first chapter deals with a presentation of the basic ideas. The second one is devoted to the discussion of how the decision maker makes a decision on the models to be used by ordering them. The third one is concerned with the presentation of the decision theory frame for presenting the statistical models, and therefore for organizing the ideas using this point of view. Chapter four is devoted to present the reduction of information provided by the sample by means of sufficiency. A good discussion on the use of Information theory would be welcomed. Chapters follow it on invariance and in large sample result. It closes with a chapter on Estimation and another on Testing Statistical Hypothesis.

The book ends with a list of references. It is a good source for specialized courses, I highly recommend it.

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HEAVY-TAIL PHENOMENA. PROBABILISTIC AND STATISTICAL MODELING

Sidney I. Resnick (2007)

Springer Series in Operations Research and Engineering
ISBN 10-0-387-24272-4 ISBN 13-978-387-24272-9
eISBN 10-0-387-45024-6 eISBN 13-978-0-0387-45024-7
XIX+404

The book is divided into five parts and an independent chapter (Introduction). Part 1 has 2 chapters. They present regular varying functions and statistical asymptotic theories. In Chapter 2 six theorems and corollaries are proved. 11 problems are proposed. In Chapter 3 we have 17 basic convergence theorems, as Portmanteu, Skorohod,Slustky . They are proved and give a support to the needed theory. Part 2 is composed by a chapter and deals with statistical modeling for estimating the tail index. Hill estimators as well as algorithms for computing are presented in particular the discussion of them in the computation of value-at-risk is very encouraging for practitioners involved with financial problems. The convergence properties, of the particular methods used in the heavy tail problematic, are studied at large. Part 3 has 3 chapters. It is mainly concerned with the particularities of heavy tailed Poisson processes. The results are presented through the discussion and of more than 30 theorems and a large series of examples are worked out. The coefficient of tail dependence and the sample correlation function s are presented. Part 4 has one chapter. It presents asymptotical normality of tail empirical measure m Hill estimators etc... Part 5 is devoted to present an appendix with the used notations and the software for computing Hill estimators QQ-plotting, multivariate heavy tails etc.

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STOCHASTIC SWITCHING SYSTEMS. ANALYSIS AND DESIGN

El-Kébir Boukas (2006)

Birkhäuser
ISBN 10-0 8176-3782-6
e ISBN 0-8176-4452-0
ISBN 13 978-0-8176-3782-6

This book provides of and up-to-date presentation of the problems of analysis and design appearing in control systems theory and practice. It has 6 chapters.

The first one deals with the presentation of the class of stochastic switching systems studied in the oeuvre. Its sixth section presents the notation and abbreviations used in the book. Chapter 2 (Stability Problems) is devoted to the study of problems arising in stochastic stability (it is stated) where different concepts are discussed (Lyapunov equations, robustness etc). Chapter 3 (Stabilization Problem) treats of the stabilization and robustness of controllers (feedback and output stabilization). The so-called LMI-based designing is presented. Chapter 4 (H_∞ Control Problem) uses the LMI-framework and the general problem is settled considering the feedback stabilization problem (stabilization and robustness, stochastic switching systems) and considers the effect of external disturbances in the systems. Chapter 5

(Filtering Problem) discusses the problems related with the use of different filters (Kalman and H_∞ filters) and their robust properties. Chapter 6 deals with the singularity of piecewise deterministic systems as well as with stochastic stability.

Numerical examples are worked out for illustrating the practical meaning of the theoretical results discussed

An Appendix brings the needed Algebraic and Stochastic concepts are given grouped in 4 sections.

The book should be welcome by mathematicians, engineers and other scientists involved with the nowadays problems of control systems.

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BAYESIAN NETWORKS AND INFLUENCE DIAGRAMS: A GIDE TO CONSTRUCTION AND ANALYSIS.
R. Scott and J.J. Higgins (2008)

Springer (Information Science and Statistics) ISBN 978-0-387-74100-0

IX+ 345 £47,50

The main motivation of this book is to provide a guide to the use and modeling of Influence Diagrams by using Bayesian Networks procedures. That is: construct a network, assume a Bayesian approach and make your decisions based a decision support system with a Bayesian 'Intelligencer', and do not worry, the results will be optimal. The essential is that the capabilities of modern computers can deal with determining an optimal solution. The book is a good complement to the existent books used classically for teaching the so-called 'Artificial intelligence' subjects. The practitioners should make of it a main tool in their work because it gives a guide for modeling, using the Bayesian point of view of probabilistic networks, avoiding the use of the complexity of mathematical modeling when possible.

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