

Brownian Motion De Gruyter Textbook

Bernstein functions appear in various fields of mathematics, e.g. probability theory, potential theory, operator theory, functional analysis and complex analysis—often with different definitions and under different names. Among the synonyms are `Laplace exponent` instead of Bernstein function, and complete Bernstein functions are sometimes called `Pick functions`, `Nevanlinna functions` or `operator monotone functions`. This monograph—now in its second revised and extended edition—offers a self-contained and unified approach to Bernstein functions and closely related function classes, bringing together old and establishing new connections. For the second edition the authors added a substantial amount of new material. As in the first edition Chapters 1 to 11 contain general material which should be accessible to non-specialists, while the later Chapters 12 to 15 are devoted to more specialized topics. An extensive list of complete Bernstein functions with their representations is provided.

The series is devoted to the publication of monographs and high-level textbooks in mathematics, mathematical methods and their applications. Apart from covering important areas of current interest, a major aim is to make topics of an interdisciplinary nature accessible to non-specialists, while the later Chapters 12 to 15 are devoted to more specialized topics. An extensive list of complete Bernstein functions with their representations is provided. 30 years ago by the late Professor Heinz Bauer and Professor Peter Gabriel with the aim to establish a series of monographs and textbooks of high standard, written by scholars with an international reputation presenting current fields of research in pure and applied mathematics. While the editorial board of the Studies has changed with the years, the aspirations of the Studies are unchanged. In times of rapid growth of mathematical knowledge carefully written monographs and textbooks written by experts are needed more than ever, not least to pave the way for the next generation of mathematicians. In this sense the editorial board and the publisher of the Studies are devoted to continue the Studies as a service to the mathematical community. Please submit any book proposals to Niels Jacob. Originally published in 2003, Mathematical Techniques in Finance has become a standard textbook for master’s-level finance courses containing a significant quantitative element while also being suitable for finance PhD students. This fully revised second edition continues to offer a carefully crafted blend of numerical applications and theoretical grounding in economics, finance, and mathematics, and provides plenty of opportunities for students to practice applied mathematics and cutting-edge finance. Alas Cerny mixes tools from calculus, linear algebra, probability theory, numerical mathematics, and programming to analyze in an accessible way some of the most intriguing problems in financial economics. The textbook is the perfect hands-on introduction to asset pricing, optimal portfolio selection, risk measurement, and investment evaluation. The new edition includes the most recent research in the area of incomplete markets and unhedgeable risks, adds a chapter on finite difference methods, and thoroughly updates all bibliographic references. Eighty figures, over seventy examples, twenty-five simple ready-to-run computer programs, and several spreadsheets enhance the learning experience. All computer codes have been rewritten using MATLAB and online supplementary materials have been completely updated. A standard textbook for graduate finance courses Introduction to asset pricing, portfolio selection, risk measurement, and investment evaluation Detailed examples and MATLAB codes integrated throughout the text Exercises and summaries of main points conclude each chapter The book deals with propagation of errors on data through mathematical models with applications in finance and physics. It is interesting for scientists and practitioners when studying the sensitivity of their models to small changes in the hypotheses. The book differs from what is usually done in sensitivity analysis because it yields powerful new tools allowing to manage errors in stochastic models as those used in modern finance.

Metals and Alloys

Analog and Hybrid Computer Programming

An Introduction

Dynamical Theories of Brownian Motion

Introduction to Further Topics in Analysis

Fractals in Engineering

The contributions by leading experts in this book focus on a variety of topics of current interest related to information-based complexity, ranging from function approximation, numerical integration, numerical methods for the sphere, and algorithms with random information, to Bayesian probabilistic numerical methods and numerical methods for stochastic differential equations.

A graduate-course text, written for readers familiar with measure-theoretic probability and discrete-time processes, wishing to explore stochastic processes in continuous time. The vehicle chosen for this exposition is Brownian motion, which is presented as the canonical example of both a martingale and a Markov process with continuous paths. In this context, the theory of stochastic integration and stochastic calculus is developed, illustrated by results concerning representations of martingales and change of measure on Wiener space, which in turn permit a presentation of recent advances in financial economics. The book contains a detailed discussion of weak and strong solutions of stochastic differential equations and a study of local time for semimartingales, with special emphasis on the theory of Brownian local time. The whole is backed by a large number of problems and exercises.

”This book covers such topics as Lp spaces, distributions, Baire category, probability theory and Brownian motion, several complex variables and oscillatory integrals in Fourier analysis. The authors focus on key results in each area, highlighting their importance and the organic unity of the subject”--Provided by publisher.

These notes are based on a course of lectures given by Professor Nelson at Princeton during the spring term of 1966. The subject of Brownian motion has long been of interest in mathematical probability. In these lectures, Professor Nelson traces the history of earlier work in Brownian motion, both the mathematical theory, and the natural phenomenon with its physical interpretations. He continues through recent dynamical theories of Brownian motion, and concludes with a discussion of the relevance of these theories to quantum field theory and quantum statistical mechanics.

Geodesy

Measures, Integrals and Martingales

An Introduction to Stochastic Processes

Brownian Motion

The Language of Dirichlet Forms

High-Dimensional Probability

Brownian MotionAn Introduction to Stochastic ProcessesWalter de Gruyter GmbH & Co KG

This work offers a highly useful, well developed reference on Markov processes, the universal model for random processes and evolutions. The wide range of applications, in exact sciences as well as in other areas like social studies, require a volume that offers a refresher on fundamentals before conveying the Markov processes and examples for applications. This work does just that, and with the necessary mathematical rigor.

Partial Differential Equations presents a balanced and comprehensive introduction to the concepts and techniques required to solve problems containing unknown functions of multiple variables. While focusing on the three most classical partial differential equations (PDEs)—the wave, heat, and Laplace equations—this detailed text also presents a broad practical perspective that merges mathematical concepts with real-world application in diverse areas including molecular structure, photon and electron interactions, radiation of electromagnetic waves, vibrations of a solid, and many more. Rigorous pedagogical tools aid in student comprehension; advanced topics are introduced frequently, with minimal technical jargon, and a wealth of exercises reinforce vital skills and invite additional self-study. Topics are presented in a logical progression, with major concepts such as wave propagation, heat and diffusion, electrostatics, and quantum mechanics placed in contexts familiar to students of various fields in science and engineering. By understanding the properties and applications of PDEs, students will be equipped to better analyze and interpret central processes of the natural world.

Publisher Description

A Guide to Random Processes and Stochastic Calculus

An Introduction in Discrete Time

Continuous Martingales and Brownian Motion

Feynman-Kac-Type Formulae and Gibbs Measures

Stationary Stochastic Processes. (MN-8)

An excellent introduction for computer scientists and electrical and electronics engineers who would like to have a good, basic understanding of stochastic processes! This clearly written book responds to the increasing interest in the study of systems that vary in time in a random manner. It presents an introductory account of some of the important topics in the theory of the mathematical models of such systems. The selected topics are conceptually interesting and have fruitful application in various branches of science and technology.

Stochastic processes occur everywhere in the sciences, economics and engineering, and they need to be understood by (applied) mathematicians, engineers and scientists alike. This book gives a gentle introduction to Brownian motion and stochastic processes, in general. Brownian motion plays a special role, since it shaped the whole subject, displays most random phenomena while being still easy to treat, and is used in many real-life models. Im this new edition, much material is added, and there are new chapters on "Wiener Chaos and Iterated Itô Integrals" and

"Brownian Local Times"

Stochastic processes occur everywhere in sciences and engineering, and need to be understood by applied mathematicians, engineers and scientists alike. This book introduces the reader gently to the subject. Brownian motions are a stochastic process, central to many applications and easy to treat. The new edition enlarges the existing chapters and offers new full chapters on Wiener Chaos and Iterated Integrals and Brownian Local Times.

This textbook provides a comprehensive introduction to chemical process engineering, linking the fundamental theory and concepts to the industrial day-to-day practice. It bridges the gap between chemical sciences and the practical chemical industry. It enables the reader to integrate fundamental knowledge of the basic disciplines, to understand the most important chemical processes, and to apply this knowledge to the practice in the industry.

Theory and Applications

Stochastic Finance

An Introduction to the Analysis of Paths on a Riemannian Manifold

Functional Analysis

Time Changes of the Brownian Motion: Poincaré Inequality, Heat Kernel Estimate and Protodistance

Industrial Inorganic Chemistry

Analog and hybrid computing recently have gained much interest as analog computers can outperform classical stored-program digital computers in some areas by orders of magnitude. This book gives a thorough introduction to analog and hybrid computer programming by means numerous worked examples from various areas. It is based on a number of introductory and advanced lectures on this topic delivered by the author at several universities.

Self-contained presentation: from elementary material to state-of-the-art research; Much of the theory in book-form for the first time; Connections are made between probability and other areas of mathematics, engineering and mathematical physics

This book gives a systematic overview of the fundamental theories, frameworks and methods for measurement and evaluation applying to geodesy, though the contribution of geodetic spatial techniques for positioning and for establishing the gravitational field receives particular emphasis. These methods have led to a change in the setting up of geodetic basic networks that is also of importance in practical terms; for interdisciplinary geodynamics research geodesy can likewise make major contributions with their assistance. The current status of geodesy is illustrated by numerous examples from survey, evaluation and analysis; an extensive literature list makes further study all the easier. The book conveys an extensive overview of the profound changes that geodesy has undergone in the past twenty years.

Industrial Inorganic Chemistry adds to the previously published graduate level textbooks on Industrial Chemistry by Mark A. Benvenuto. It focuses specifically on inorganic processes, from the largest industrial process for the production of major inorganic chemicals and metals, down to and including smaller niche processes that have become extremely important in maintaining the current quality of life. The book provides a survey on the production of essential elements and compounds, such as sulfuric acid, calcium carbonate, fertilizers as well as numerous metals and alloys. In addition to the fundamental scientific principles each chapter includes discussions on the environmental impacts: mining of raw materials, creation of by-products, pollution, and waste generation, all of which have become key factors for the potential implementation of greener methods. The author also highlights ways in which industry has begun to make industrial inorganic processes more environmentally benign. Examines major inorganic chemistry processes, their effect on every-day life and current efforts to improve processes or adapt "green" chemical production. Provides didactic links between theoretical lecture contents and current, largescale chemical processes. Valuable for students of Inorganic Chemistry, Industrial Chemistry, Chemical Engineering and Materials Sciences.

Mathematical Techniques in Finance

Selfsimilar Processes

Industrial Applications

A Dynamical Approach to Random Matrix Theory

Introduction to Stochastic Processes

Semimartingales

This specialist monograph provides an overview of the recent research on the fundamental and applied properties of nanoparticles extracted from cellulose, the most abundant polymer on the planet and an essential renewable resource. The author pioneered the use of cellulose nanoparticles (cellulose nanocrystals or whiskers and cellulose microfibrils) in nanocomposite applications. The book combines a general introduction to cellulose and basic techniques with more advanced chapters on specific properties and applications of nanocellulose.

The purpose of this book is to present results on the subject of weak convergence in function spaces to study invariance principles in statistical applications to dependent random variables, U-statistics, censor data analysis. Different techniques, formerly available only in a broad range of literature, are for the first time presented here in a self-contained fashion. Contents: Weak convergence of stochastic processes Weak convergence in metric spaces Weak convergence on C[0, 1] and D[0, T] Central limit theorem for semi-martingales and applications Central limit theorems for dependent random variables Empirical process Bibliography

Emcompassing both introductory and more advanced research material, these notes deal with the author’s contributions to stochastic processes and focus on Brownian motion processes and its derivative white noise. Originally published in 1970, The Princeton Legacy Library uses the latest print-on-demand technology to again make available previously out-of-print books from the distinguished backlist of Princeton University Press. These editions preserve the original texts of these important books while presenting them in durable paperback and hardcover editions. The goal of the Princeton Legacy Library is to vastly increase access to the rich scholarly heritage found in the thousands of books published by Princeton University Press since its founding in 1905.

The modeling of stochastic dependence is fundamental for understanding random systems evolving in time. When measured through linear correlation, many of these systems exhibit a slow correlation decay—a phenomenon often referred to as long-memory or long-range dependence. An example of this is the absolute returns of equity data in finance. Selfsimilar stochastic processes (particularly fractional Brownian motion) have long been postulated as a means to model this behavior, and the concept of selfsimilarity for a stochastic process is now proving to be extraordinarily useful. Selfsimilarity translates into the equality in distribution between the process under a linear time change and the same process properly scaled in space, a simple scaling property that yields a remarkably rich theory with far-flung applications. After a short historical overview, this book describes the current state of knowledge about selfsimilar processes and their applications. Concepts, definitions and basic properties are emphasized, giving the reader a road map of the realm of selfsimilarity that allows for further exploration. Such topics as noncentral limit theory, long-range dependence, and operator selfsimilarity are covered alongside statistical estimation, simulation, sample path properties, and stochastic differential equations driven by selfsimilar processes. Numerous references point the reader to current applications. Though the text uses the mathematical language of the theory of stochastic processes, researchers and end-users from such diverse fields as mathematics, physics, biology, telecommunications, finance, econometrics, and environmental science will find it an ideal entry point for studying the already extensive theory and applications of selfsimilarity.

Probability Theory

Markov Processes, Semigroups, and Generators

Bernstein Functions

Engineering Mathematics with Examples and Applications

Addressing the Gap between Studies and Chemical Industry

Nanocellulose

This book, first published in 2005, introduces measure and integration theory as it is needed in many parts of analysis and probability.

Brownian motion is one of the most important stochastic processes in continuous time and with continuous state space. Within the realm of stochastic processes, Brownian motion is at the intersection of Gaussian processes, martingales, Markov processes, diffusions and random fractals, and It has influenced the study of these topics. Its central position within mathematics is matched by numerous applications in science, engineering and mathematical finance. Often textbooks on probability theory cover, if at all, Brownian motion only briefly. On the other hand, there is a considerable gap to more specialized texts on Brownian motion which is not so easy to overcome for the novice. The authors’ aim was to write a book which can be used as an introduction to Brownian motion and stochastic calculus, and as a first course in continuous-time and continuous-state Markov processes. They also wanted to have a text which would be both a readily accessible mathematical back-up for contemporary applications (such as mathematical finance) and a foundation to get easy access to advanced monographs. This textbook, tailored to the needs of graduate and advanced undergraduate students, covers Brownian motion, starting from its elementary properties, certain distributional aspects, path properties, and leading to stochastic calculus based on Brownian motion. It also includes numerical recipes for the simulation of Brownian motion.

Metals and Alloys continues the series of graduate textbooks on Industrial Chemistry by Mark A. Benvenuto. It shows the essential industrial applications, processes and chemistry background for the extraction of metals, as well as the production and applications of alloys. The book discusses how large scale and minor processes affect every-day life, challenges in prevention and removal of waste by-products and illustrates selected chemical processes for which efforts have been made to improve and “green” industrial processes. The author also highlights ways in which industry has begun to make industrial inorganic processes more environmentally benign. Examines production of metals and alloys. Sources for metals are sorted by metal and alloy and backed by basic chemical background information and process set up. Overviews on worldwide ore distribution, refined metal and alloy production numbers are another focus of the book. Discusses sources, key processes and applications. Connects what students learn in class to real, large-scale metals chemistry that makes modern life possible. Intended for students, graduate students and beginners in the field of Chemistry, Chemical Engineering and Materials Sciences.

Process Engineering, Chemical Engineering and Materials Science. Visit degruyter.com for more information on books by Mark A. Benvenuto: Industrial Chemistry (2013), Industrial Chemistry: For Advanced Students (2015) and Industrial Inorganic Chemistry (2015). About the Author: Mark Anthony Benvenuto A Fellow of the American Chemical Society, he received his PhD in inorganic chemistry from the University of Virginia. After a post-doctoral fellowship at the Pennsylvania State University, he joined the University of Virginia.

Detroit Mercy, where he is now the Department Chairman and teaches an industrial chemistry course.

In this paper, time changes of the Brownian motions on generalized Sierpinski carpets including *n*-dimensional cube [0,1]*n* are studied. Intuitively time change corresponds to alteration to density of the medium where the heat flows. In case of the Brownian motion on [0,1], density of the medium is homogeneous and represented by the Lebesgue measure. The author’s study includes densities which are singular to the homogeneous one. He establishes a rich class of measures called measures having weak exponential decay. This class contains measures which are singular to the homogeneous one such as Liouville measures on [0,1]2 and self-similar measures. The author shows the existence of time changed process and associated jointly continuous heat kernel for this class of measures. Furthermore, he obtains diagonal lower and upper estimates of the heat kernel as time tends to 0. In particular, to express the principal part of the lower diagonal heat kernel estimate, he introduces “protodistance” associated with the density of the measure.

substitute of ordinary metric. If the density has the volume doubling property with respect to the Euclidean metric, the protodistance is shown to produce metrics under which upper off-diagonal sub-Gaussian heat kernel estimate and lower near diagonal heat kernel estimate will be shown.

An Introduction with Applications in Data Science

Paris-Princeton Lectures on Mathematical Finance 2010

Asymptotic Statistics

Weak Convergence of Stochastic Processes

Brownian Motion and Stochastic Calculus

Process Engineering

This book is an introduction to financial mathematics. It is intended for graduate students in mathematics and for researchers working in academia and industry. The focus on stochastic models in discrete time has two immediate benefits. First, the probabilistic machinery is simpler, and one can discuss right away some of the key problems in the theory of pricing and hedging of financial derivatives. Second, the paradigm of a complete financial market, where all derivatives admit a perfect hedge, becomes the exception rather than the rule. Thus, the need to price and hedge derivatives arising from market incompleteness appears at a very early stage. The first part of the book contains a study of a simple one-period model, which also serves as a building block for later developments. Topics include the characterization of arbitrage-free markets, preferences on asset profiles, an introduction to equilibrium analysis, and monetary measures of financial risk. In the second part, the idea of dynamic hedging of contingent claims is developed in a multiperiod framework. Topics include martingale measures, pricing formulas for derivatives and American options, superhedging, and hedging strategies with minimal shortfall risk. This fourth, newly revised edition contains more than one hundred exercises. It also includes material on risk measures and the related issue of model uncertainty, in particular a chapter on dynamic risk measures and sections on robust utility maximization and on efficient hedging with convex risk measures. Contents: Part I: Mathematical finance in one period Arbitrage theory Preferences Optimality and equilibrium Monetary measures of risk Part II: Dynamic hedging Dynamic arbitrage

theory American contingent claims Superhedging Efficient hedging Hedging under constraints Minimizing the hedging error Dynamic risk measures

This book aims to bridge the gap between probability and differential geometry. It gives two constructions of Brownian motion on a Riemannian manifold: an extrinsic one where the manifold is realized as an embedded submanifold of Euclidean space and an intrinsic one based on the “rolling” map. It is then shown how geometric quantities (such as curvature) are reflected by the behavior of Brownian paths and how that behavior can be used to extract information about geometric quantities. Readers should have a strong background in analysis with basic knowledge of differential geometry.

In stochastic calculus and differential geometry, Professor Stroock is a highly-respected expert in probability and analysis. The clarity and style of his exposition further enhance the quality of this volume. Readers will find an inviting introduction to the study of paths and Brownian motion on Riemannian manifolds.

A co-publication of the AMS and the Courant Institute of Mathematical Sciences at New York University This book is a concise and self-contained introduction of recent techniques to prove local spectral universality for large random matrices. Random matrix theory is a fast expanding research area, and this book mainly focuses on the methods that the authors participated in developing over the past few years. Many other interesting topics are not included, and neither are several new developments within the framework of these methods. The authors have instead to present key concepts that they believe are the core of these methods and should be relevant for future applications. They keep technicalities to a minimum to make the book accessible to graduate students. With this in mind, they include in this book the basic notions and tools for high-dimensional analysis, such as large deviation, entropy, Dirichlet form, and the logarithmic Sobolev inequality. This manuscript has been developed and continuously improved over the last five years. The authors have taught this material in several regular graduate courses at Harvard, Munich, and Vienna, in addition to various summer schools and short courses. Titles in this series are co-published with the Courant Institute of Mathematical Sciences at New York University.

Engineering Mathematics with Examples and Applications provides a compact and concise primer in the field, starting with the foundations, and then gradually developing to the advanced level of mathematics that is necessary for all engineering disciplines. Therefore, this book’s aim is to help undergraduates rapidly develop the fundamental knowledge of engineering mathematics. The book can also be used by graduates to review and refresh their mathematical skills. Step-by-step worked examples will help the students gain more insights and build sufficient confidence in engineering mathematics and problem-solving. The main approach and style of this book is informal, theorem-free, and practical. By using an informal and theorem-free approach, all fundamental mathematics topics required for engineering are covered, and readers can gain such basic knowledge of all important topics without worrying about rigorous (often boring) proofs. Certain rigorous proof and derivatives are presented in an informal way by direct, straightforward mathematical operations and calculations, giving students the same level of fundamental knowledge without any tedious steps. In addition, this practical approach provides over 100 worked examples so that students can see how each step of mathematical problems can be derived without any gap or jump in steps. Thus, readers can build their understanding and mathematical confidence gradually and in a step-by-step manner. Covers fundamental engineering topics that are presented at the right level, without worry of rigorous proofs Includes step-by-step worked examples (of which 100+ feature in the work) Provides an emphasis on numerical methods, such as root-finding algorithms, numerical integration, and numerical methods of differential equations Balances theory and practice to aid in practical problem-solving in various contexts and applications

Error Calculus for Finance and Physics

Tools for Incomplete Markets - Second Edition

A Course in Financial Calculus

Brownian Motion, 2nd Edition

An Introduction to Random Fields

Multivariate Algorithms and Information-Based Complexity

"This is a magnificent book! Its purpose is to describe in considerable detail a variety of techniques used by probabilists in the investigation of problems concerning Brownian motion....This is THE book for a capable graduate student starting out on research in probability: the effect of working through it is as if the authors are sitting beside one, enthusiastically explaining the theory, presenting further developments as exercises." -BULLETIN OF THE L.M.S.

Brownian motion is one of the most important stochastic processes in continuous time and with continuous state space. Within the realm of stochastic processes, Brownian motion is at the intersection of Gaussian processes, martingales, Markov processes, diffusions and random fractals, and it has influenced the study of these topics. Its central position within mathematics is matched by numerous applications in science, engineering and mathematical finance. Often textbooks on probability theory cover, if at all, Brownian motion only briefly. On the other hand, there is a considerable gap to more specialized texts on Brownian motion which is not so easy to overcome for the novice. The authors’ aim was to write a book which can be used as an introduction to Brownian motion and stochastic calculus, and as a first course in continuous-time and continuous-state Markov processes. They also wanted to have a text which would be both a readily accessible mathematical back-up for contemporary applications (such as mathematical finance) and a foundation to get easy access to advanced monographs. This textbook, tailored to the needs of graduate and advanced undergraduate students, covers Brownian motion, starting from its elementary properties, certain distributional aspects, path properties, and leading to stochastic calculus based on Brownian motion. It also includes numerical recipes for the simulation of Brownian motion.

This is the second updated and extended edition of the successful book on Feynman-Kac theory. It offers a state-of-the-art mathematical account of functional integration methods in the context of self-adjoint operators and semigroups using the concepts and tools of modern stochastic analysis. The first volume concentrates on Feynman-Kac-type formulae and Gibbs measures.

This textbook is devoted to the general asymptotic theory of statistical experiments. Local asymptotics for statistical models in the sense of local asymptotic (mixed) normality or local asymptotic quadraticity make up the core of the book. Numerous examples deal with classical independent and identically distributed models and with stochastic processes. The book can be read in different ways, according to possibly different mathematical preferences of the reader. One reader may focus on the statistical theory, and thus on the chapters about Gaussian shift models, mixed normal and quadratic models, and on local asymptotics where the limit model is a Gaussian shift or a mixed normal or a quadratic experiment (LAN, LAMN, LAQ). Another reader may prefer an introduction to stochastic process models where given statistical results apply, and thus concentrate on subsections or chapters on likelihood ratio processes and some diffusion type models where LAN, LAMN or LAQ occurs. Finally, readers might put together both aspects. The book is suitable for graduate students starting to work in statistics of stochastic processes, as well as for researchers interested in a precise introduction to this area.

Partial Differential Equations

A Course on Stochastic Processes

With a View to Stochastic Processes

With Applications to Statistical Limit Theorems

From Nature to High Performance Tailored Materials

Multiparameter Processes

The Paris-Princeton Lectures in Financial Mathematics, of which this is the fourth volume, publish cutting-edge research in self-contained, expository articles from outstanding specialists - established or on the rise! The aim is to produce a series of articles that can serve as an introductory reference source for research in the field. The articles are the result of frequent exchanges between the finance and financial mathematics groups in Paris and Princeton. The present volume sets standards with five articles by: 1. Areski Cousin, Monique Jeanblanc and Jean-Paul Laurent, 2. Stéphane Crepey, 3. Olivier Guéant, Jean-Michel Lasry and Pierre-Louis Lions, 4. David Hobson and 5. Peter Tankov.

An integrated package of powerful probabilistic tools and key applications in modern mathematical data science.