[DOC] Stochastic Processes And Filtering Theory Andrew H Jazwinski

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Stochastic Processes and Filtering Theory-Andrew H. Jazwinski 2013-04-15 This unified treatment of linear and nonlinear filtering theory presents material previously available only in journals, and in terms accessible to engineering students. Its sole prerequisites are advanced calculus, the theory of ordinary differential equations, and matrix analysis. Although theory is emphasized, the text discusses numerous practical applications as well. Taking the state-space approach to filtering, this text models dynamical systems by finite-dimensional Markov processes, outputs of stochastic difference, and differential equations. Starting with background material on probability theory and stochastic processes, the author introduces and defines the problems of filtering, prediction, and smoothing. He presents the mathematical solutions to nonlinear filtering problems, and he specializes the nonlinear theory to linear problems. The final chapters deal with applications, addressing the development of approximate nonlinear filters, and presenting a critical analysis of their performance.

Stochastic Processes and Filtering Theory-Andrew H. Jazwinski 2007 This unified treatment presents material previously available only in journals, and in terms accessible to engineering students. Although theory is emphasized, it discusses numerous practical applications as well. 1970 edition.

Stochastic Processes and Filtering Theory-Andrew H. Jazwinski 1970-01-31 This book presents a unified treatment of linear and nonlinear filtering theory for engineers, with sufficient emphasis on applications to enable the reader to use the theory. The need for this book is twofold. First, although linear estimation theory is relatively well known, it is largely scattered in the journal literature and has not been collected in a single source. Second, available literature on the continuous nonlinear theory is quite esoteric and controversial, and thus inaccessible to engineers uninitiated in measure theory and stochastic differential equations. Furthermore, it is not clear from the available literature whether the nonlinear theory can be applied to practical engineering problems. In attempting to fill the stated needs, the author has retained as much mathematical rigor as he felt was consistent with the prime objective—to explain the theory to engineers. Thus, the author has avoided measure theory in this book by using mean square convergence, on the premise that everyone knows how to average. As a result, the author only requires of the reader background in advanced calculus, theory of ordinary differential equations, and matrix analysis.

Stochastic Processes and Filtering Theory-Andrew H. Jazwinski 1974

An Introduction to Stochastic Filtering Theory-Jie Xiong 2008-04-17 As a topic, Stochastic Filtering Theory has progressed rapidly in recent years. For example, the (branching) particle system representation of the optimal filter has been extensively studied to seek more effective numerical approximations of
the optimal filter. The stability of the filter with 'incorrect' initial state, as well as the long-term behavior of the optimal filter, has attracted the attention of many researchers, and there are some recent exciting results in singular filtering models. In this text, Jie Xiong introduces the reader to the basics of Stochastic Filtering Theory before covering the key recent advances. The text is written in a clear style suitable for graduates in mathematics and engineering with a background in basic probability.

Stochastic Filtering Theory - G. Kallianpur
2013-04-17 This book is based on a seminar given at the University of California at Los Angeles in the Spring of 1975. The choice of topics reflects my interests at the time and the needs of the students taking the course. Initially the lectures were written up for publication in the Lecture Notes series. However, when I accepted Professor A. V. Balakrishnan’s invitation to publish them in the Springer series on Applications of Mathematics it became necessary to alter the informal and often abridged style of the notes and to rewrite or expand much of the original manuscript so as to make the book as self-contained as possible. Even so, no attempt has been made to write a comprehensive treatise on filtering theory, and the book still follows the original plan of the lectures. While this book was in preparation, the two-volume English translation of the work by R. S. Liptser and A. N. Shiryaev has appeared in this series. The first volume and the present book have the same approach to the subject, viz. that of martingale theory. Liptser and Shiryaev go into greater detail in the discussion of statistical applications and also consider interpolation and extrapolation as well as filtering.

Stochastic Processes and Filtering Theory - Andrew R. Jazwinski 1970

Fundamentals of Stochastic Filtering - Alan Bain 2008-10-08 This book provides a rigorous mathematical treatment of the non-linear stochastic filtering problem using modern methods. Particular emphasis is placed on the theoretical analysis of numerical methods for the solution of the filtering problem via particle methods. The book should provide sufficient background to enable study of the recent literature. While no prior knowledge of stochastic filtering is required, readers are assumed to be familiar with measure theory, probability theory and the basics of stochastic processes. Most of the technical results that are required are stated and proved in the appendices. Exercises and solutions are included.

Stationary Stochastic Processes - Georg Lindgren 2012-10-01 Intended for a second course in stationary processes, Stationary Stochastic Processes: Theory and Applications presents the theory behind the field's widely scattered applications in engineering and science. In addition, it reviews sample function properties and spectral representations for stationary processes and fields, including a portion on stationary point processes. Features:
- Presents and illustrates the fundamental correlation and spectral methods for stochastic processes and random fields
- Explains how the basic theory is used in special applications like detection theory and signal processing, spatial statistics, and reliability
- Motivates mathematical theory from a statistical model-building viewpoint
- Introduces a selection of special topics, including extreme value theory, filter theory, long-range dependence, and point processes
- Provides more than 100 exercises with hints to solutions and selected full solutions

This book covers key topics such as ergodicity, crossing problems, and extremes, and opens the doors to a selection of special topics, like extreme value theory, filter theory, long-range dependence, and point processes, and includes many exercises and examples to illustrate the theory. Precise in mathematical details without being pedantic, Stationary Stochastic Processes: Theory and Applications is for the student with some experience with stochastic processes and a desire for deeper understanding without getting bogged down in abstract mathematics.

Optimal Filtering - Brian D. O. Anderson 2012-05-23 Graduate-level text extends studies of signal processing, particularly regarding communication systems and digital filtering theory. Topics include filtering, linear systems, and estimation; discrete-time Kalman filter; time-invariant filters; more. 1979 edition.

Optional Processes - Mohamed Abdelghani 2020-06-02 It is well-known that modern stochastic calculus has been exhaustively
developed under usual conditions. Despite such a well-developed theory, there is evidence to suggest that these very convenient technical conditions cannot necessarily be fulfilled in real-world applications. Optional Processes: Theory and Applications seeks to delve into the existing theory, new developments and applications of optional processes on "unusual" probability spaces. The development of stochastic calculus of optional processes marks the beginning of a new and more general form of stochastic analysis. This book aims to provide an accessible, comprehensive and up-to-date exposition of optional processes and their numerous properties. Furthermore, the book presents not only current theory of optional processes, but it also contains a spectrum of applications to stochastic differential equations, filtering theory and mathematical finance. Features Suitable for graduate students and researchers in mathematical finance, actuarial science, applied mathematics and related areas Compiles almost all essential results on the calculus of optional processes in unusual probability spaces Contains many advanced analytical results for stochastic differential equations and statistics pertaining to the calculus of optional processes Develops new methods in finance based on optional processes such as a new portfolio theory, defaultable claim pricing mechanism, etc. Authors Mohamed Abdelghani completed his PhD in mathematical finance from the University of Alberta, Edmonton, Canada. He is currently working as a vice president in quantitative finance and machine learning at Morgan Stanley, New York, USA. Alexander Melnikov is a professor in mathematical finance at the University of Alberta. His research interests belong to the area of contemporary stochastic analysis and its numerous applications in mathematical finance, statistics and actuarial science. He has written six books as well as over 100 research papers in leading academic journals.

Stochastic Processes - Robert G. Gallager 2013-12-12 This definitive textbook provides a solid introduction to discrete and continuous stochastic processes, tackling a complex field in a way that instils a deep understanding of the relevant mathematical principles, and develops an intuitive grasp of the way these principles can be applied to modelling real-world systems. It includes a careful review of elementary probability and detailed coverage of Poisson, Gaussian and Markov processes with richly varied queuing applications. The theory and applications of inference, hypothesis testing, estimation, random walks, large deviations, martingales and investments are developed. Written by one of the world's leading information theorists, evolving over twenty years of graduate classroom teaching and enriched by over 300 exercises, this is an exceptional resource for anyone looking to develop their understanding of stochastic processes.

Filtering for Stochastic Processes with Applications to Guidance - Richard S. Bucy 1987

Stochastic Processes - Pierre Del Moral 2017-02-24 Unlike traditional books presenting stochastic processes in an academic way, this book includes concrete applications that students will find interesting such as gambling, finance, physics, signal processing, statistics, fractals, and biology. Written with an important illustrated guide in the beginning, it contains many illustrations, photos and pictures, along with several website links. Computational tools such as simulation and Monte Carlo methods are included as well as complete toolboxes for both traditional and new computational techniques.
Introduction to Stochastic Processes - Erhan Cinlar 2013-02-20 Clear presentation employs methods that recognize computer-related aspects of theory. Topics include expectations and independence, Bernoulli processes and sums of independent random variables, Markov chains, renewal theory, more. 1975 edition.

Measure Theory and Filtering - Lakhdar Aggoun 2004-09-13 The estimation of noisily observed states from a sequence of data has traditionally incorporated ideas from Hilbert spaces and calculus-based probability theory. As conditional expectation is the key concept, the correct setting for filtering theory is that of a probability space. Graduate engineers, mathematicians and those working in quantitative finance wishing to use filtering techniques will find in the first half of this book an accessible introduction to measure theory, stochastic calculus, and stochastic processes, with particular emphasis on martingales and Brownian motion. Exercises are included. The book then provides an excellent users' 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.

Stochastic Processes and Functional Analysis - Jerome Goldstein 2020-09-24 "Covers the areas of modern analysis and probability theory. Presents a collection of papers given at the Festschrift held in honor of the 65 birthday of M. M. Rao, whose prolific published research includes the well-received Marcel Dekker, Inc. books Theory of Orlicz Spaces and Conditional Measures and Applications. Features previously unpublished research articles by a host of internationally recognized scholars."

Stochastic Calculus and Applications - Samuel N. Cohen 2015-11-18 Completely revised and greatly expanded, the new edition of this text takes readers who have been exposed to only basic courses in analysis through the modern general theory of random processes and stochastic integrals as used by systems theorists, electronic engineers and, more recently, those working in quantitative and mathematical finance. Building upon the original release of this title, this text will be of great interest to research mathematicians and graduate students working in those fields, as well as quants in the finance industry. New features of this edition include: End of chapter exercises; New chapters on basic measure theory and Backward SDEs; Reworked proofs, examples and explanatory material; Increased focus on motivating the mathematics; Extensive topical index. "Such a self-contained and complete exposition of stochastic calculus and applications fills an existing gap in the literature. The book can be recommended for first-year graduate studies. It will be useful for all who intend to work with stochastic calculus as well as with its applications."-Zentralblatt (from review of the First Edition)

Optimal Filtering - V.N. Fomin 2012-10-10 This book is devoted to an investigation of some important problems of modern filtering theory concerned with systems of 'any nature being able to perceive, store and process an information and apply it for control and regulation'. (The above quotation is taken from the preface to [27]). Despite the fact that filtering theory is largely worked out (and its major issues such as the Wiener-Kolmogorov theory of optimal filtering of stationary processes and Kalman-Bucy recursive filtering theory have become classical), a development of the theory is far from complete. A great deal of recent activity in this area is observed, researchers are trying consistently to generalize famous results, extend them to more broad classes of processes, realize and justify more simple procedures for processing measurement data in order to obtain more efficient filtering algorithms. As to nonlinear filtering, it remains much as fragmentary. Here much progress has been made by R. L. Stratonovich and his successors in the area of filtering of Markov processes. In this volume an effort is made to advance in certain of these issues. The monograph has evolved over many years, coming of age by stages. First it was an impressive job of gathering together the bulk of the important contributions to estimation theory, an understanding and modernization of some of its results and methods, with the intention of applying them to recursive filtering problems.

Stationary Stochastic Processes for
Scientists and Engineers - Georg Lindgren
2013-10-11 Stochastic processes are indispensable tools for development and research in signal and image processing, automatic control, oceanography, structural reliability, environmetrics, climatology, econometrics, and many other areas of science and engineering. Suitable for a one-semester course, Stationary Stochastic Processes for Scientists and Engineers teaches students how to use these processes efficiently. Carefully balancing mathematical rigor and ease of exposition, the book provides students with a sufficient understanding of the theory and a practical appreciation of how it is used in real-life situations. Special emphasis is on the interpretation of various statistical models and concepts as well as the types of questions statistical analysis can answer. The text first introduces numerous examples from signal processing, economics, and general natural sciences and technology. It then covers the estimation of mean value and covariance functions, properties of stationary Poisson processes, Fourier analysis of the covariance function (spectral analysis), and the Gaussian distribution. The book also focuses on input-output relations in linear filters, describes discrete-time auto-regressive and moving average processes, and explains how to solve linear stochastic differential equations. It concludes with frequency analysis and estimation of spectral densities. With a focus on model building and interpreting the statistical concepts, this classroom-tested book conveys a broad understanding of the mechanisms that generate stationary stochastic processes. By combining theory and applications, the text gives students a well-rounded introduction to these processes. To enable hands-on practice, MATLAB® code is available online.

Filtering Theory for Stochastic Processes with Two Dimensional Time Parameter - A. Bensoussan 1979

Stochastic Processes - Richard F. Bass
2011-10-06 This comprehensive guide to stochastic processes gives a complete overview of the theory and addresses the most important applications. Pitched at a level accessible to beginning graduate students and researchers from applied disciplines, it is both a course book and a rich resource for individual readers. Subjects covered include Brownian motion, stochastic calculus, stochastic differential equations, Markov processes, weak convergence of processes and semigroup theory. Applications include the Black-Scholes formula for the pricing of derivatives in financial mathematics, the Kalman–Bucy filter used in the US space program and also theoretical applications to partial differential equations and analysis. Short, readable chapters aim for clarity rather than full generality. More than 350 exercises are included to help readers put their new-found knowledge to the test and to prepare them for tackling the research literature.

Stochastics, Control and Robotics - Harish Parthasarathy 2021-06-24 This book discusses various problems in stochastic Processes, Control Theory, Electromagnetics, Classical and Quantum Field Theory & Quantum Stochastics. The problems are chosen to motivate the interested reader to learn more about these subjects from other standard sources. Stochastic Process theory is applied to the study of differential equations of mechanics subject to external noise. Some issues in general relativity like Geodesic motion, field theory in curved space time etc. are discussed via isolated problems. The more recent quantum stochastic process theory as formulated by R.L. Hudson and K. R. Parathasarathy is discussed. This provides a non commutative operator theoretic version of stochastic process theory. V.P. Belavkin's approach to quantum filtering based on non demolition measurements and Hudson Parathasarathy calculus has been discussed in detail. Quantum versions of the simple exclusion model in Markov process theory have been

Theory and Statistical Applications of Stochastic Processes - Yuliya Mishura
2018-01-04 This book is concerned with the theory of stochastic processes and the theoretical aspects of statistics for stochastic processes. It combines classic topics such as construction of stochastic processes, associated filtrations, processes with independent increments, Gaussian processes, martingales, Markov properties, continuity and related properties of trajectories with contemporary subjects: integration with respect to Gaussian processes, Itô integration, stochastic analysis, stochastic differential equations, fractional Brownian motion and parameter estimation in diffusion models.
Simulation of Stochastic Processes with Given Accuracy and Reliability - Yuriy V. Kozachenko
Kozachenko 2016-11-22 Simulation has now become an integral part of research and development across many fields of study. Despite the large amounts of literature in the field of simulation and modeling, one recurring problem is the issue of accuracy and confidence level of constructed models. By outlining the new approaches and modern methods of simulation of stochastic processes, this book provides methods and tools in measuring accuracy and reliability in functional spaces. The authors explore analysis of the theory of Sub-Gaussian (including Gaussian one) and Square Gaussian random variables and processes and Cox processes. Methods of simulation of stochastic processes and fields with given accuracy and reliability in some Banach spaces are also considered. Provides an analysis of the theory of Sub-Gaussian (including Gaussian one) and Square Gaussian random variables and processes Contains information on the study of the issue of accuracy and confidence level of constructed models not found in other books on the topic Provides methods and tools in measuring accuracy and reliability in functional spaces

Stochastic Evolution Systems - Boris L. Rozovsky
Rozovsky 2018-10-03 This monograph, now in a thoroughly revised second edition, develops the theory of stochastic calculus in Hilbert spaces and applies the results to the study of generalized solutions of stochastic parabolic equations. The emphasis lies on second-order stochastic parabolic equations and their connection to random dynamical systems. The authors further explore applications to the theory of optimal non-linear filtering, prediction, and smoothing of partially observed diffusion processes. The new edition now also includes a chapter on chaos expansion for linear stochastic evolution systems. This book will appeal to anyone working in disciplines that require tools from stochastic analysis and PDEs, including pure mathematics, financial mathematics, engineering and physics.

Introduction to Stochastic Processes - Paul G. Hoel
Hoel 1986-12-01 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.

Applied Optimal Estimation - The ANALYTIC SCIENCES CORPORATION
1974 This is the first book on the optimal estimation that places its major emphasis on practical applications, treating the subject more from an engineering than a mathematical orientation. Even so, theoretical and mathematical concepts are introduced and developed sufficiently to make the book a self-contained source of instruction for readers without prior knowledge of the basic principles of the field. The work is the product of the technical staff of The Analytic Sciences Corporation (TASC), an organization whose success has resulted largely from its applications of optimal estimation techniques to a wide variety of real situations involving large-scale systems. Arthur Gelb writes in the Foreword that "It is our intent throughout to provide a simple and interesting picture of the central issues underlying modern estimation theory and practice. Heuristic, rather than theoretically elegant, arguments are used extensively, with emphasis on physical insights and key questions of practical importance." Numerous illustrative examples, many based on actual applications, have been interspersed throughout the text to lead the student to a concrete understanding of the theoretical material. The inclusion of problems with "built-in" answers at the end of each of the nine chapters further enhances the self-study potential of the text. After a brief historical prelude, the book introduces the mathematics underlying random process theory and state-space characterization of linear dynamic systems. The theory and practice of
optimal estimation is then presented, including filtering, smoothing, and prediction. Both linear and non-linear systems, and continuous- and discrete-time cases, are covered in considerable detail. New results are described concerning the application of covariance analysis to non-linear systems and the connection between observers and optimal estimators. The final chapters treat such practical and often pivotal issues as suboptimal structure, and computer loading considerations. This book is an outgrowth of a course given by TASC at a number of US Government facilities. Virtually all of the members of the TASC technical staff have, at one time and in one way or another, contributed to the material contained in the work.

Introduction to Probability Theory and Stochastic Processes-John Chiasson 2013-04-08
This comprehensive textbook provides an introduction to statistical methods for graduate engineers—offering thorough coverage of important probability-related topics to aid in product and system design, reliability engineering, quality control, and more. It introduces engineers to abstract concepts in mathematical stochastic processes and probability theory and covers topics such as coin tossing, simulation of random phenomena, Brownian motion, white noise, and Kalman filtering.

Stochastic Processes in Engineering Systems-E. Wong 2012-12-06
This book is a revision of Stochastic Processes in Information and Dynamical Systems written by the first author (E.W.) and published in 1971. The book was originally written, and revised, to provide a graduate level text in stochastic processes for students whose primary interest is its applications. It treats both the traditional topic of stationary processes in linear time-invariant systems as well as the more modern theory of stochastic systems in which dynamic structure plays a profound role. Our aim is to provide a high-level, yet readily accessible, treatment of those topics in the theory of continuous-parameter stochastic processes that are important in the analysis of information and dynamical systems. The theory of stochastic processes can easily become abstract. In dealing with it from an applied point of view, we have found it difficult to decide on the appropriate level of rigor. We intend to provide just enough mathematical machinery so that important results can be stated with precision and clarity; so much of the theory of stochastic processes is inherently simple if the suitable framework is provided. The price of providing this framework seems worth paying even though the ultimate goal is in applications and not the mathematics per se.

This book consists of a series of new, peer-reviewed papers in stochastic processes, analysis, filtering and control, with particular emphasis on mathematical finance, actuarial science and engineering. Papers contributors include colleagues, collaborators and former students of Robert Elliott, many of whom are world-leading experts and have made fundamental and significant contributions to these areas. This book provides new important insights and results by eminent researchers in the considered areas, which will be of interest to researchers and practitioners. The topics considered will be diverse in applications, and will provide contemporary approaches to the problems considered. The areas considered are rapidly evolving. This volume will contribute to their development, and present the current state-of-the-art stochastic processes, analysis, filtering and control.

Contributing authors include: H Albrecher, T Bielecki, F Dufour, M Jeanblanc, I Karatzas, H-H Kuo, A Melnikov, E Platen, G Yin, Q Zhang, C Chiarella, W Fleming, D Madan, R Mamon, J Yan, V Krishnamurthy.


Topics in Stochastic Processes-Robert B. Ash 2014-06-20
Topics in Stochastic Processes covers specific processes that have a definite physical interpretation and that explicit numerical results can be obtained. This book contains five chapters and begins with the L2 stochastic processes and the concept of prediction theory. The next
A chapter discusses the principles of ergodic theorem to real analysis, Markov chains, and information theory. Another chapter deals with the sample function behavior of continuous parameter processes. This chapter also explores the general properties of Martingales and Markov processes, as well as the one-dimensional Brownian motion. The aim of this chapter is to illustrate those concepts and constructions that are basic in any discussion of continuous parameter processes, and to provide insights to more advanced material on Markov processes and potential theory. The final chapter demonstrates the use of theory of continuous parameter processes to develop the Itô stochastic integral. This chapter also provides the solution of stochastic differential equations. This book will be of great value to mathematicians, engineers, and physicists.

Introduction to Random Signals and Applied Kalman Filtering with Matlab Exercises and Solutions - Robert Grover Brown 1997 In this updated edition the main thrust is on applied Kalman filtering. Chapters 1-3 provide a minimal background in random process theory and the response of linear systems to random inputs. The following chapter is devoted to Wiener filtering and the remainder of the text deals with various facets of Kalman filtering with emphasis on applications. Starrred problems at the end of each chapter are computer exercises. The authors believe that programming the equations and analyzing the results of specific examples is the best way to obtain the insight that is essential in engineering work.


Thinking Probabilistically - Ariel Amir 2020-12-17 An introductory text providing the reader with a thorough background to the rich world of applications of stochastic processes.

Essentials of Stochastic Processes - Richard Durrett 2016-11-07 Building upon the previous editions, this textbook is a first course in stochastic processes taken by undergraduate and graduate students (MS and PhD students from math, statistics, economics, computer science, engineering, and finance departments) who have had a course in probability theory. It covers Markov chains in discrete and continuous time, Poisson processes, renewal processes, martingales, and option pricing. One can only learn a subject by seeing it in action, so there are a large number of examples and more than 300 carefully chosen exercises to deepen the reader’s understanding. Drawing from teaching experience and student feedback, there are many new examples and problems with solutions that use TI-83 to eliminate the tedious details of solving linear equations by hand, and the collection of exercises is much improved, with many more biological examples. Originally included in previous editions, material too advanced for this first course in stochastic processes has been eliminated while treatment of other topics useful for applications has been expanded. In addition, the ordering of topics has been improved; for example, the difficult subject of martingales is delayed until its usefulness can be applied in the treatment of mathematical finance.

Stochastic Processes, Estimation, and Control - Jason L. Speyer 2008-11-06 The authors provide a comprehensive treatment of stochastic systems from the foundations of probability to stochastic optimal control. The book covers discrete- and continuous-time stochastic dynamic systems leading to the derivation of the Kalman filter, its properties, and its relation to the frequency domain Wiener filter as well as the dynamic programming derivation of the linear quadratic Gaussian (LQG) and the linear exponential Gaussian (LEG) controllers and their relation to H∞ controllers and system robustness. This book is suitable for first-year graduate students in electrical, mechanical, chemical, and aerospace engineering specializing in systems and control. Students in computer science, economics, and possibly business will also find it useful.

Applied Stochastic Differential Equations - Simo Särkkä 2019-04-30 Stochastic differential equations are differential equations whose solutions are stochastic processes. They exhibit appealing mathematical properties that are useful in modeling uncertainties and noisy phenomena in many disciplines. This book is motivated by applications of stochastic differential equations in target tracking and...
medical technology and, in particular, their use in methodologies such as filtering, smoothing, parameter estimation, and machine learning. It builds an intuitive hands-on understanding of what stochastic differential equations are all about, but also covers the essentials of It calculus, the central theorems in the field, and such approximation schemes as stochastic Runge-Kutta. Greater emphasis is given to solution methods than to analysis of theoretical properties of the equations. The book's practical approach assumes only prior understanding of ordinary differential equations. The numerous worked examples and end-of-chapter exercises include application-driven derivations and computational assignments. MATLAB/Octave source code is available for download, promoting hands-on work with the methods.