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Mathematics and Statistics Catalogue 2019

January - June

New and Forthcoming Titles

Welcome

Welcome to the January to June 2019 Mathematics and Statistics Catalogue.

Mathematics is the study and application of arithmetic, algebra, geometry, and analysis. Mathematical methods and tools, such as MATLAB® and Mathematica®, are used to model, analyse, and solve diverse problems in a range of fields, including biology, computer science, engineering, finance, medicine, physics, and the social sciences. Alongside this, our catalogue also contains a selection of Statistics titles. These books encompass theory and methods, including Bayesian, spatial, regression, nonparametric, and multivariate techniques, as well as computational tools, such as R, SAS, Stata, and MATLAB®.

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Contents

MATHEMATICS	2
Advanced Mathematics	2
Algebra	3
Applied Mathematics	4
Computational Numerical Analysis	5
Differential Equations	6
Mathematical Analysis and Logic	7
Mathematics - General	9
STATISTICS	11
Clinical Trials	11
Geostatistics	12
Statistical Computing	13
Statistical Theory and Methods	15
Statistics - General	17
Statistics and Probability	20
Index	21

Advanced Discrete Mathematics

Graph Algorithms, Algebraic Structures, Coding Theory, and Cryptography

Sriraman Sridharan and R. Balakrishnan

Discrete Mathematics has permeated the whole of mathematics so much so that, it has now come to be taught even at the high school level. This book covers advanced topics in Discrete Mathematics and its applications to day-to-day problems in several areas. It is intended for graduate students of Computer Science, Mathematics and Engineering. A number of examples have been given to enhance the understanding of concepts. The programming languages used are Pascal and C.

Chapman and Hall/CRC

Market: Mathematics

April 2019: 235 x 156: 210pp

Hb: 978-0-815-34739-2: **£79.99**

eBook: 978-0-429-48632-6

* For full contents and more information, visit: www.crcpress.com/9780815347392

Computational Methods for Approximation of Large-Scale Descriptor Systems

Mohammad Monir Uddin

This book mainly focuses on the MOR techniques for the first and second order descriptor systems. It first discusses the various MOR techniques for standard systems comparing them with each other. Later these are generalized to the descriptor systems. The book then develops theories and provides the mathematical algorithms for implementing them in real-world applications. This book is intended for assisting advanced undergraduates, graduates and researchers in academics and industries.

Chapman and Hall/CRC

Market: Mathematics

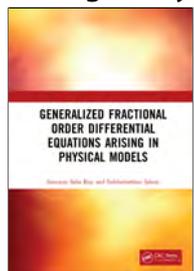
July 2019: 235 x 156: 320pp

Hb: 978-0-815-34803-0: **£110.00**

eBook: 978-1-351-02862-2

* For full contents and more information, visit: www.crcpress.com/9780815348030

Generalized Fractional Order Differential Equations Arising in Physical Models



Santanu Saha Ray and Subhadarshan Sahoo

The focus of this book is to analyze the various semi-analytical and analytical methods for finding approximate and exact solutions of fractional order partial differential equations. This book explores the approximate and exact solutions obtained by various analytical methods for fractional order partial differential equations arising in physical models.

Chapman and Hall/CRC

Market: Mathematics

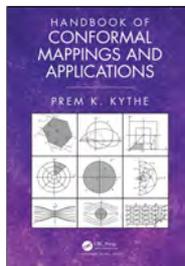
November 2018: 254 x 178: 314pp

Hb: 978-1-138-36681-7: **£140.00**

eBook: 978-0-429-43004-6

* For full contents and more information, visit: www.crcpress.com/9781138366817

Handbook of Conformal Mappings and Applications



Prem K. Kythe, University of New Orleans, Louisiana, USA

This book is a compendium of at least all known conformal maps to date, with diagrams and description, and all possible applications in different scientific disciplines, such as: fluid flows, heat transfer, acoustics, electromagnetic fields as static fields in electricity and magnetism, various mathematical models and methods, including solutions of certain integral equations.

Chapman and Hall/CRC

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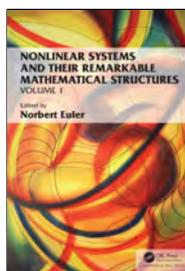
January 2019: 254 x 178: 906pp

Hb: 978-1-138-74847-7: **£222.00**

eBook: 978-1-315-18023-6

* For full contents and more information, visit: www.crcpress.com/9781138748477

Nonlinear Systems and Their Remarkable Mathematical Structures



Edited by Norbert Euler, Lulea University of Technology, Lulea

Nonlinear Systems and Their Remarkable Mathematical Structures describes the recent progress in nonlinear differential equations and nonlinear dynamical systems (both continuous and discrete). Each chapter is self-contained and aims to clearly illustrate some of the mathematical theories of nonlinear systems. The book should be suitable for some graduate and postgraduate students in mathematics, the natural sciences, and engineering sciences, as well as for researchers (both pure and applied) interested in nonlinear systems.

CRC Press

Market: Mathematics

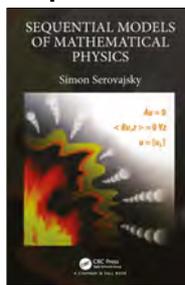
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Sequential Models of Mathematical Physics



Simon Serovajsky, Al-Farabi Kazakh National University, Department of Differential Equations and Control Theory, Almaty, Kazakhstan

The equations of mathematical physics are the mathematical models of the large class of phenomenon of physics, chemistry, biology, economics, etc. In *Sequential Models of Mathematical Physics*, the author considers the justification of the process of constructing mathematical models. The book seeks to determine the classic, generalized and sequential solutions, the relationship between these solutions, its direct physical sense, the methods of its practical finding, and its existence.

CRC Press

Market: Mathematics

January 2019: 235 x 156: 288pp

Hb: 978-1-138-60103-1: **£92.00**

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* For full contents and more information, visit: www.crcpress.com/9781138601031

Exploring Linear Algebra

Labs and Projects with MATLAB®

Crista Arangala, Elon University, North Carolina, USA

Series: *Textbooks in Mathematics*

This text is meant to be a hands-on lab manual that can be used in class everyday to guide the exploration of the theory and applications of linear algebra. For the most part, labs can be used individually or in a sequence. Each lab consists of an explanation of material with integrated exercises. Some labs are split into multiple subsections and thus exercises are separated by those subsections. The exercise sections integrate problems using Mathematica demonstrations (an online tool that can be used with a browser with java capabilities) and Matlab coding. This allows students to discover the theory and applications of linear algebra in a meaningful and memorable way.

Chapman and Hall/CRC

Market: Mathematics

April 2019: 235 x 156: 152pp

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eBook: 978-1-315-16099-3

* For full contents and more information, visit: www.crcpress.com/9781138063518

Linear Algebra

James R. Kirkwood, Sweet Briar College, Virginia, USA and Bessie H. Kirkwood

Series: *Textbooks in Mathematics*

This is the second of a two-part set of books for the undergraduate linear algebra sequence. The text is for the more advanced course taught in most mathematics departments. This course is based around matrix theory and focused on the theory of linear algebra. In addition to the chapters found in the author's *Elementary Linear Algebra*, here he offers seven additional chapters including the Jordan Canonical Form and The Perron-Frobenius Theorem. The book emphasizes intuition as well as rigor. It offers a historical perspective.

Chapman and Hall/CRC

Market: Mathematics

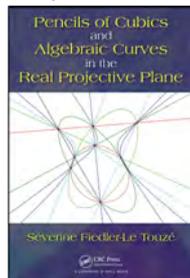
March 2019: 254 x 178: 500pp

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eBook: 978-1-498-77686-8

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Pencils of Cubics and Algebraic Curves in the Real Projective Plane



Séverine Fiedler - Le Touzé, University Toulouse III

Pencils of Cubics and Algebraic Curves in the Real Projective Plane thoroughly examines the combinatorial configurations of n generic points in \mathbb{R}^2 . Especially how it is the data describing the mutual position of each point with respect to lines and conics passing through others. The first part of the book answers questions related to using rational cubics and pencils of cubics. The other two parts deal with configurations of eight points in convex position, and applications and results around Hilbert's sixteenth problem.

Chapman and Hall/CRC

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Certain Number-Theoretic Episodes In Algebra

Sivaramakrishnan R, University of Calicut, Thrissur, India

The book attempts to point out the interconnections between number theory and algebra with a view to making a student understand certain basic concepts in the two areas forming the subject-matter of the book.

Chapman and Hall/CRC

Market: Mathematics

February 2019: 235 x 156: 416pp

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eBook: 978-1-351-02334-4

Prev. Ed Hb: 978-0-824-75895-0

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Jun Mitani, University of Tsukuba, Information and Systems Faculty of Engineering, Japan

The origami introduced in this book is based on simple techniques. Some were previously known by origami artists and some were discovered by the author. *Curved-Folding Origami Design* shows a way to explore new area of origami composed of curved folds. Each technique is introduced in a step-by-step fashion, followed by some beautiful artwork examples. A commentary explaining the theory behind the technique is placed at the end of each chapter.

CRC Press

April 2019: 210 x 280: 88pp

Hb: 978-0-367-18027-0: **£74.99**Pb: 978-0-367-18025-6: **£29.99**

eBook: 978-0-429-05917-9

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Methods and Applications

Edited by Herbert Jodlbauer, FH-STEYR, Frank Emmert-Streib, Queen's University Belfast, UK and Matthias Dehmer

This book deals with theoretical and practical results of Entrepreneurial Sciences and Management (ESM), emphasising quantitative methods. ESM has been a modern and exciting research field in which methods from various disciplines have been applied. However, the existing body of literature lacks the proper use of mathematical and formal models; individuals who perform research in this broad interdisciplinary area have been trained differently. In particular, they are not used to solving business-oriented problems mathematically. In this book, we utilize formal and mathematical techniques in ESM as an advantage for developing theories and models which are falsifiable.

CRC Press

Market: Mathematics

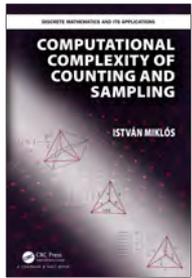
March 2019: 235 x 156: 176pp

Hb: 978-0-815-37001-7: **£115.00**

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Computational Complexity of Counting and Sampling



Istvan Miklos, Renyi Institute, Budapest, Hungary

Series: Discrete Mathematics and Its Applications

Computational Complexity of Counting and Sampling provides readers with comprehensive and detailed coverage of the subject of computational complexity. It is primarily geared for researchers in enumerative combinatorics, discrete mathematics and theoretical computer science.

It begins with the basics such as the algorithmic point of view, and theoretical computer science point of view. Later, the book focuses on advanced topics like stochastic approximations of counting computational objects and holographic algorithms. After finishing the book, readers will agree that the subject is

well covered as it starts with the basics and gradually explores the more complex aspects of the topic.

Chapman and Hall/CRC

Market: Mathematics

January 2019: 235 x 156: 378pp

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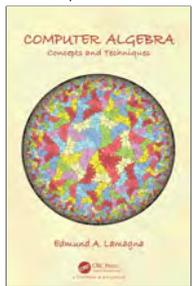
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Edmund A. Lamagna

The goal of *Computer Algebra: Concepts and Techniques* is to demystify computer algebra systems for a wide audience, including students, faculty, and professionals in scientific fields such as computer science, mathematics, engineering, and physics. Unlike previous books, the only prerequisites are knowledge of first year calculus and a little programming experience — a background that can be assumed of the intended audience. The book is written in a lean and lively style, with numerous examples to illustrate the issues and techniques discussed. It presents the principal algorithms and data structures, while also discussing the inherent and practical limitations of these systems.

CRC Press

Market: Mathematics

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Mathematics at the Meridian

The History of Mathematics at Greenwich

Edited by **Raymond Gerard Flood** and **Anthony John Scott Mann**, University of Greenwich

Series: Chapman & Hall/CRC Numerical Analysis and Scientific Computing Series

Mathematicians at Greenwich have been pioneers of scientific computing since the foundation of the Royal Observatory in 1675. Early Astronomers gathered astronomical data with the purpose of enabling navigators to compute their longitude at sea and organised the work of computing tables for the Nautical Almanac on safety-critical computing systems. The 19th century saw influential critiques of Charles Babbage's mechanical calculating engines, and in the 20th century pioneered the automation of computation. The 21st saw computational mathematics has find many new applications. This book presents an account of the mathematicians who worked at Greenwich and their achievements.

CRC Press

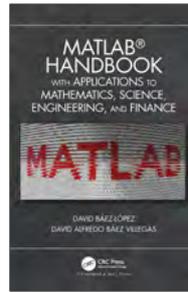
Market: Mathematics

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MATLAB Handbook with Applications to Mathematics, Science, Engineering, and Finance



Jose Miguel David Baez-Lopez, Universidad de las Américas, Puebla, Mexico and David Alfredo Baez Villegas

The purpose of this handbook is to allow users to learn and master the mathematics software package MATLAB, as well as to serve as a quick reference to some of the most used instructions in the package. A unique feature of this handbook is that it can be used by the novice and by experienced users alike. For experienced users, it has four chapters with examples and applications in engineering, finance, physics, and optimization. Exercises are included, along with solutions available for the interested reader on the book's web page. These exercises are a complement for the interested reader who wishes to get a deeper understanding of MATLAB and Simulink.

Chapman and Hall/CRC

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Variational Techniques for Elliptic Partial Differential Equations

Theoretical Tools and Advanced Applications

Francisco J. Sayas, Thomas S. Brown and Matthew E. Hassell

Variational Techniques for Elliptic Partial Differential Equations, intended for graduate students studying applied math, analysis, and/or numerical analysis, provides the necessary tools to understand the structure and solvability of elliptic partial differential equations. Beginning with the necessary definitions and theorems from distribution theory, the book gradually builds the functional analytic framework for studying elliptic PDE using variational formulations. Rather than introducing all of the prerequisites in the first chapters, it is the introduction of new problems which motivates the development of the associated analytical tools.

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Analytic Methods for Coagulation-Fragmentation Models, Volume 1

Jacek Banasiak, University of Pretoria, Hatfield, South Africa, Wilson Lamb, University of Strathclyde, Glasgow, United Kingdom and Philippe Laurencot, Université Paul Sabatier - Toulouse 3, France

Series: *Chapman & Hall/CRC Monographs and Research Notes in Mathematics*

The book begins with an in-depth survey of coagulation-fragmentation models, followed by a detailed presentation of relevant earlier results in the field. The mathematical tools necessary for the modern development of the theory as well as essential facts from infinite-dimensional dynamical systems, are introduced. The next few chapters are devoted to methods suitable to cases where the process is dominated by fragmentation. The following chapter focuses on weak compactness methods for solving coagulation-fragmentation equations. The final chapter deals with the long-term asymptotic behaviour of solutions to coagulation and fragmentation equations.

Chapman and Hall/CRC

Market: Mathematics

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Fundamentals of Partial Differential Equations

Rajen Kumar Sinha

Partial Differential Equations (PDEs) often arise in mathematical formulation of many physical problems in science and engineering. This book is aimed to bring out a comprehensive exposure to the basics of partial differential equations which will be accessible to a large class of engineering and science students.

Chapman and Hall/CRC

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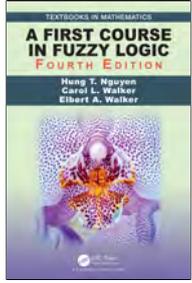
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Mark Verus Lawson

A First Course in Logic is an introduction to first-order logic suitable for first and second year mathematicians and computer scientists. There are three components to this course: propositional logic; Boolean algebras; and predicate/first-order, logic. Logic is the basis of proofs in mathematics — how do we know what we say is true? — and also of computer science — how do I know this program will do what I think it will?

CRC Press

Market: Mathematics

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Advanced Functional Analysis

Eberhard Malkowsky, University of Nis, Serbia and Vladimir Rakočević, University of Nis, Serbia

Advanced Functional Analysis is a self-contained and comprehensive reference for advanced functional analysis and can serve as a guide for related research. The book can be used as a textbook in advanced functional analysis, which is a modern and important field in mathematics, for graduate and postgraduate courses and seminars at universities. At the same time, it enables the interested readers to do their own research.

CRC Press

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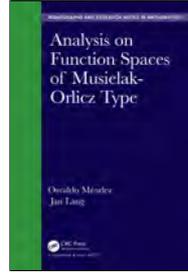
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Analysis on Function Spaces of Musielak-Orlicz Type



Osvaldo Mendez, University of Texas at El Paso, USA and Jan Lang, The Ohio State University, Columbus, USA

Series: *Chapman & Hall/CRC Monographs and Research Notes in Mathematics*

Analysis on Function Spaces of Musielak-Orlicz Type provides a state-of-the-art survey on the theory of function spaces of Musielak-Orlicz type. The book also offers readers a step-by-step introduction to the theory of Musielak-Orlicz spaces, and introduces associated function spaces, extending up to the current research on the topic

Chapman and Hall/CRC

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Certified Security by Design Using Higher Order Logic

Shiu-Kai Chin, Syracuse University, Dept. of Electrical Engineering and Computer Science and Susan Older, Syracuse University, Dept. of Electrical Engineering and Computer Science

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This textbook serves the needs of engineers and computer scientists responsible for designing, implementing, and verifying secure computer and information systems. Methods are based on the application of logic as a means for describing, reasoning about, and verifying the properties of systems. We use logic from the conceptualization stage, through the design phase, and up to and including verification and certification. The use of computer-aided design (CAD) tools and computer assisted reasoning tools, such as theorem provers, is essential. We have included numerous examples to illustrate principles, as well as many exercises to serve as assessments of knowledge.

Chapman and Hall/CRC

Market: Information Technology

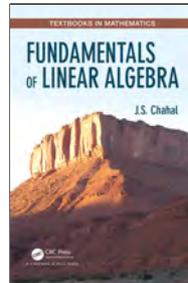
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Fundamentals of Linear Algebra



J.S. Chahal, Brigham Young University

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Fundamentals of Linear Algebra is like no other book on the subject. By following a natural and unified approach to the subject it has, in less than 250 pages, achieved a more complete coverage of the subject than books with more than twice as many pages. For example, the textbooks in use in the United States prove the existence of a basis only for finite dimensional vector spaces. This book proves it for any given vector space.

With his experience in algebraic geometry and commutative algebra, the author defines the dimension of a vector space as its Krull dimension. By doing so, most of the facts about bases when the dimension is finite, are trivial consequences of this

definition.

Chapman and Hall/CRC

Market: Mathematics

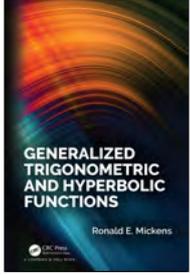
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Generalized Trigonometric and Hyperbolic Functions



Ronald E. Mickens

Generalized Trigonometric and Hyperbolic Functions highlights, to those in the area of generalized trigonometric functions, an alternative path to the creation and analysis of these classes of functions. Previous efforts have started with integral representations for the inverse generalized sine functions, followed by the construction of the associated cosine functions, and from this, various properties of the generalized trigonometric functions are derived. However, the results contained in this book are based on the application of both geometrical phase space and dynamical systems methodologies.

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Hex

The Full Story

Ryan B. Hayward, University of Alberta and Bjarne Toft, University of Southern Denmark

Hex is the subject of books by Martin Gardner and Cameron Browne. Hex theory touches on graph theory, game theory and combinatorial game theory, with elegant proofs that the game has no draws and that the first player can win. From machines built by Claude Shannon to agents using Monte Carlo Tree Search, Hex is often used in the study of artificial intelligence. Written for a wide audience, this is the full story of Hex, inside and out, with all its twists and turns: Hein's creation, Lindhard's puzzles, Nash's proofs, Gale's Bridg-it, the game of Rex, Shannon's machines, Bridg-it's fall, Hex's resilience, Hex theory, the hunt for winning strategies, and the rise of Hexbots.

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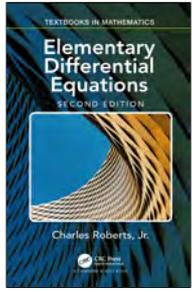
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eBook: 978-0-429-03196-0

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2nd Edition

Elementary Differential Equations



Charles Roberts, Indiana State University, Terre Haute, USA
 Series: *Textbooks in Mathematics*

This second edition is a valuable, up-to-date tool for instructors teaching courses about differential equations. It serves as an excellent introductory textbook for undergraduate students majoring in applied mathematics, computer science, various engineering disciplines and other sciences. They also will find that the textbook will aid them greatly in their professional careers because of its instructions on how to use computers to solve equations.

Chapman and Hall/CRC
Market: Mathematics
 December 2018: 235 x 156: 536pp
 Hb: 978-1-498-77608-0: £82.00
 eBook: 978-1-498-77611-0
 Prev. Ed Hb: 978-1-439-81908-1

* For full contents and more information, visit: www.crcpress.com/9781498776080

Handbook of the Tutte Polynomial

Edited by Joanna A. Ellis-Monaghan, Saint Michael's College, Colchester, Vermont, USA and Iain Moffatt

Series: *Chapman & Hall/CRC Monographs and Research Notes in Mathematics*

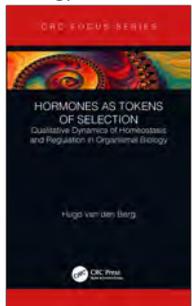
It has become a well-known fact that most graph polynomials are related to the Tutte Polynomial in some way. In fact, that area of graph polynomials has grown to such an extent that it now has its own subject classification (05C31). This handbook is the first one published on the Tutte Polynomial which is a central, heavily-studied object in the field of combinatorics with applications in a wide range of other fields such as geometry, biology and physics.

Chapman and Hall/CRC
Market: Mathematics
 June 2019: 235 x 156: 550pp
 Hb: 978-1-482-24062-7: £130.00

* For full contents and more information, visit: www.crcpress.com/9781482240627

Hormones as Tokens of Selection

Qualitative Dynamics of Homeostasis and Regulation in Organismal Biology



Hugo van den Berg

Hormones as Tokens of Selection addresses deep questions in biology: How are biological systems controlled? How can one formulate general theories of homeostasis and control and instantiate such theories in mathematical models? How can one use evolutionary arguments to guide our answers to these questions, recognising that the control mechanisms themselves are a product of evolution? Biological systems are exceptionally varied and extremely difficult to understand, because they are complex and experimentation remains limited relative to the challenges at hand. Moreover, biological phenomena occur at a wide range of temporal and spatial scales.

CRC Press
Market: Mathematics
 January 2019: 216 x 140: 136pp
 Hb: 978-0-367-13441-9: £54.00
 eBook: 978-0-429-02650-8

* For full contents and more information, visit: www.crcpress.com/9780367134419

2nd Edition

Interest Rate Modeling

Theory and Practice, Second Edition

Lixin Wu

Series: *Chapman and Hall/CRC Financial Mathematics Series*

Containing many results that are new, or which exist only in recent research articles, *Interest Rate Modeling: Theory and Practice* portrays the theory of interest rate modeling as a three-dimensional object of finance, mathematics, and computation. It introduces all models with financial-economical justifications, develops options along the martingale approach, and handles option evaluations with precise numerical methods.

CRC Press
Market: Mathematics
 February 2019: 235 x 156: 496pp
 Hb: 978-0-815-37891-4: £96.00
 eBook: 978-1-351-22742-1
 Prev. Ed Hb: 978-1-420-09056-7

* For full contents and more information, visit: www.crcpress.com/9780815378914

2nd Edition

Lessons in Play

An Introduction to Combinatorial Game Theory

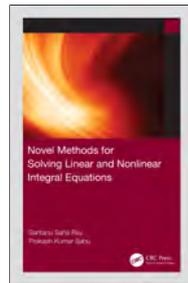
Michael Albert, University of Otago, Dunedin, New Zealand, Richard Nowakowski, Dalhousie University, Halifax, Canada and David Wolfe

A thorough revision of a popular text in combinatorial game theory, this second edition reorganizes presentation to make it more widely accessible. The beginning focuses less on technical and more on conceptual material and applications. Still written in a textbook style with supporting evidence and proofs, the authors add many more exercises and examples and implement a two-step approach for some aspects of the material involving an initial introduction, examples, and basic results to be followed later by more technical and abstract results.

A K Peters/CRC Press
Market: Mathematics
 June 2019: 235 x 156: 352pp
 Hb: 978-1-482-24303-1: £61.99
 eBook: 978-1-482-24304-8
 Prev. Ed Hb: 978-1-568-81277-9

* For full contents and more information, visit: www.crcpress.com/9781482243031

Novel Methods for Solving Linear and Nonlinear Integral Equations



Santanu Saha Ray and Prakash Kumar Sahu

This book deals with the numerical solution of integral equations. Numerical methods are based on approximation of functions and the authors apply wavelet approximation to the unknown function of integral equations. The book has been written in simple and clear mathematical logical language. Basic theories and theorems on construction of wavelets have been provided initially and each chapter contains illustrated examples via figures and tables.

Chapman and Hall/CRC
Market: Mathematics
 December 2018: 235 x 156: 242pp
 Hb: 978-1-138-36274-1: £100.00
 eBook: 978-0-429-43190-6

* For full contents and more information, visit: www.crcpress.com/9781138362741

Volume Inequalities for Arrangements of Convex Bodies

Karoly Bezdek and Muhammad Ali Khan

Series: Discrete Mathematics and Its Applications

The book is centered around two major conjectures of discrete geometry: the Hadwiger-Levi conjecture (1955) and the Kneser-Poulsen conjecture (1955). Although both conjectures have been solved only in dimension two and are open in higher dimensions, they have already influenced a great deal of research in discrete geometry and surely will continue to do so. The book gives a detailed account of all major results already achieved with complete proofs and emphasizing the role of volumetric methods/inequalities. The book's main purpose is to present the relevant frontline research in discrete geometry while generating wider interest in two fundamental conjectures of discrete geometry.

Chapman and Hall/CRC

Market: Mathematics

June 2019: 235 x 156: 304pp

Hb: 978-1-498-74378-5: **£57.99**

eBook: 978-1-498-74379-2

* For full contents and more information, visit: www.crcpress.com/9781498743785

How to Be Successful as a Consulting Biostatistician in Industry

Peter Mesenbrink, Novartis Pharmaceuticals Corporation, East Hanover, New Jersey, USA

Series: Chapman & Hall/CRC Biostatistics Series

This book provides guidance to the statisticians in industry on the non-technical "soft" skills that one needs to have in order to be successful as a statistician from the first day on the job until the last day. Focus is on oral and written communication as well as the right set of values and behaviors needed to have the biggest impact as a scientist and a leader. Examples from real world experiences are shared to help emphasize key points.

Chapman and Hall/CRC

Market: Statistics

May 2019: 235 x 156: 304pp

Hb: 978-1-498-75315-9: £61.99

* For full contents and more information, visit: www.crcpress.com/9781498753159

Innovative Strategies, Statistical Solutions and Simulations for Modern Clinical Trials

Mark Chang, Veristat, John Balsler, Veristat, Robin Bliss and Jim Roach

Series: Chapman & Hall/CRC Biostatistics Series

Every day, there are new problems and challenges that arise from the practice of clinical trials. Many of them require strategic thinking and innovative methods since some traditional methods are not adequate for 21st century clinical trials. To solve these problems requires good methodological skills, but also an in-depth knowledge of the practical problems we are dealing with and a strategic vision of the big picture. This book will show how to combine these two aspects and solve the problems.

Chapman and Hall/CRC

Market: Statistics

March 2019: 235 x 156: 424pp

Hb: 978-0-815-37944-7: £88.99

eBook: 978-1-351-21454-4

* For full contents and more information, visit: www.crcpress.com/9780815379447

Platform Trial Designs in Drug Development

Umbrella Trials and Basket Trials

Edited by Zoran Antonijevic, MTEK Sciences and Robert A. Beckman

Series: Chapman & Hall/CRC Biostatistics Series

Drug development sponsors are facing a myriad of indications that they can consider for their product development; this particularly being the case with cancer. They cannot run individual trials for all products in all indications and this results in missed opportunities. Sponsors have to start thinking of alternative approaches, as one drug, one population, one indication, one phase is no longer feasible. Clinical trial programs known as "basket" and "umbrella" have already demonstrated that multi-product, multi-indication trials can be efficient and feasible.

Chapman and Hall/CRC

Market: Statistics

November 2018: 235 x 156: 304pp

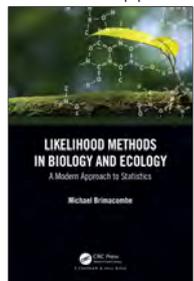
Hb: 978-1-138-05245-1: £96.00

eBook: 978-1-315-16775-6

* For full contents and more information, visit: www.crcpress.com/9781138052451

Likelihood Methods in Biology and Ecology

A Modern Approach to Statistics



Michael Brimacombe, New Jersey Medical School, Newark, USA

Through an integrated and comparative approach, Bayesian Likelihood Methods in Ecology and Biology provides a clear guide to the development, application, and interpretation of Bayesian statistical methods to real-world scientific problems in ecology and biology. The book presents an overview of likelihood-based statistical models and offers a modern Bayesian interpretation. Applications of these models to biological and ecological problems are then presented in detail. Statistical methods used for calculations include linear models, categorical data analysis, and survival analysis. A CD-ROM of datasets and computer coding using programs such as WinBUGS and S-PLUS

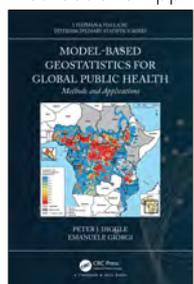
accompanies the book.

Chapman and Hall/CRC
December 2018: 235 x 156: 202pp
Hb: 978-1-584-88788-1: **£74.99**

* For full contents and more information, visit: www.crcpress.com/9781584887881

Model-based Geostatistics for Global Public Health

Methods and Applications



Peter J. Diggle, Lancaster University, UK and **Emanuele Giorgi**, Lancaster University

Series: Chapman & Hall/CRC Interdisciplinary Statistics

Presents state-of-the-art methods in model-based geostatistics (MBG) and its application to problems in global public health. Scientific objective is to describe the pattern of spatial variation in a health outcome using explicit probability models and established principles of statistical inference.

Chapman and Hall/CRC

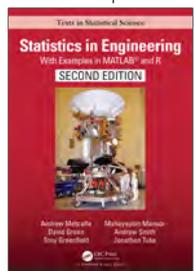
Market: Statistics
February 2019: 235 x 156: 255pp
Hb: 978-1-138-73235-3: **£74.99**
eBook: 978-1-315-18849-2

* For full contents and more information, visit: www.crcpress.com/9781138732353

2nd Edition

Statistics in Engineering

With Examples in MATLAB® and R



Andrew Metcalfe, University of Adelaide, Australia, **David Green**, **Tony Greenfield**, Greenfield Research, UK, **Mayhayaudin Mansor**, **Andrew Smith** and **Jonathan Tuke**

Series: Chapman & Hall/CRC Texts in Statistical Science

This is a textbook for an undergraduate course in statistics for engineers with a minimal calculus prerequisite. The second edition differs from existing books in three main aspects: it is the only introductory statistics textbook written for engineers that uses R throughout the text, there is an emphasis on statistical methods most relevant to engineers that are illustrated with practical applications, and there is an emphasis on random number generation and simulation, all very useful features in

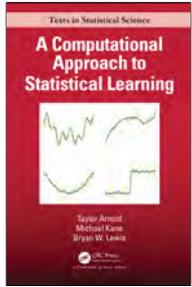
engineering.

Chapman and Hall/CRC
January 2019: 254 x 178: 792pp
Hb: 978-1-439-89547-4: **£49.99**
Prev. Ed Hb: 978-0-412-49220-4

* For full contents and more information, visit: www.crcpress.com/9781439895474



A Computational Approach to Statistical Learning



Taylor Arnold, University of Richmond Richmond, VA, Michael Kane, Yale University, New Haven, Connecticut, USA and Bryan W. Lewis

Series: *Chapman & Hall/CRC Texts in Statistical Science*

This book synthesizes those techniques from numerical analysis, algorithms, data structures, and optimization theory most commonly employed in statistics and machine learning. We provide concrete applications of these methods by giving complete reference implementations for a large set of the most commonly used statistical estimators. The goal is to provide a self-contained textbook explaining the inner algorithmic workings of statistical estimators.

Chapman and Hall/CRC

Market: Statistics

February 2019: 235 x 156: 369pp

Hb: 978-1-138-04637-5: **£59.99**

eBook: 978-1-315-17140-1

* For full contents and more information, visit: www.crcpress.com/9781138046375

Analysis of Longitudinal Data by Example

You-Gan Wang, Queensland University of Technology, Brisbane, Australia, Liya Fu, Xi'an Jiaotong University, PR of China and Sudhir Paul, University of Windsor, Canada

Development in methodology on longitudinal data is fast. Currently, there are a lack of intermediate /advanced level textbooks which introduce students and practicing statisticians to the updated methods on correlated data inference. This book will present a discussion of the modern approach to semiparametric inference, including the links between the theories of random effects models, likelihood functions and estimators, and various types of efficient statistical models. The theory will be supported with practical examples of R-codes and R-packages applied to interesting case-studies from a number of different areas.

Chapman and Hall/CRC

Market: Statistics

May 2019: 235 x 156: 200pp

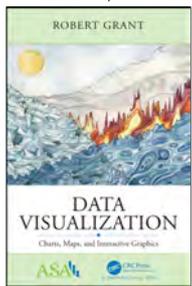
Hb: 978-1-498-76460-5: **£77.00**

eBook: 978-1-498-76462-9

* For full contents and more information, visit: www.crcpress.com/9781498764605

Data Visualization

Charts, Maps, and Interactive Graphics



Robert Grant, Kingston University & St George's, University of London

Series: *ASA-CRC Series on Statistical Reasoning in Science and Society*

This is the age of data. There are more innovations and more opportunities for interesting work with data than ever before, but there is also an overwhelming amount of quantitative information being published every day. Data visualisation has become big business, because communication is the difference between success and failure, no matter how clever the analysis may have been. The ability to visualize data is now a skill in demand across business, government, NGOs and academia. ; *Data Visualization: Charts, Maps, and Interactive Graphics* gives

an overview of a wide range of techniques and challenges, while staying accessible to anyone interested in working with and understanding data.

Chapman and Hall/CRC

Market: Statistics

November 2018: 216 x 140: 222pp

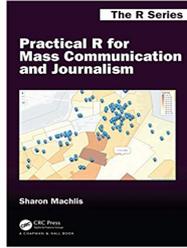
Hb: 978-1-138-55359-0: **£74.99**

Pb: 978-1-138-70760-3: **£21.99**

eBook: 978-1-315-20135-1

* For full contents and more information, visit: www.crcpress.com/9781138553590

Practical R for Mass Communication and Journalism



Sharon Machlis, IDG Communications, Inc.

Series: *Chapman & Hall/CRC The R Series*

People working in the media deal with data constantly. Journalists who are interested in improving their data skills will find this book useful. The book will concentrate on teaching R and will not go into statistical details. Data sets and projects chosen for the book are especially important in the journalism market.

Chapman and Hall/CRC

Market: Statistics

December 2018: 279 x 216: 246pp

Hb: 978-1-138-38635-8: **£133.00**

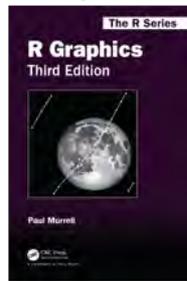
Pb: 978-1-138-72691-8: **£46.99**

eBook: 978-1-315-19111-9

* For full contents and more information, visit: www.crcpress.com/9781138386358

3rd Edition

R Graphics



Paul Murrell, The University of Auckland, New Zealand

Series: *Chapman & Hall/CRC The R Series*

This third edition of Paul Murrell's classic book on using R for graphics represents a major update, with a complete overhaul in focus and scope. It focuses primarily on the two core graphics packages in R - graphics and grid - and has a new section on integrating graphics. This section includes three new chapters on combining graphics systems and web graphics, focusing on importing graphics, integrating graphics, and advanced graphics. The emphasis in this third edition is on having the ability to produce detailed and customised graphics in a wide variety of formats, on being able to share and reuse those graphics, and on being able to integrate graphics from multiple systems.

Chapman and Hall/CRC

Market: Statistics

November 2018: 235 x 156: 423pp

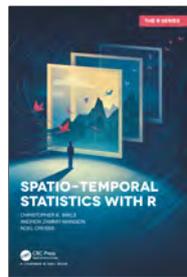
Hb: 978-1-498-78905-9: **£74.00**

eBook: 978-0-429-42276-8

Prev. Ed Hb: 978-1-439-83176-2

* For full contents and more information, visit: www.crcpress.com/9781498789059

Spatio-Temporal Statistics with R



Christopher K. Wikle, Andrew Zammit-Mangion and Noel Cressie

Series: *Chapman & Hall/CRC The R Series*

The world is becoming increasingly complex, with larger quantities of data available to be analyzed. It so happens that much of these "big data" that are available are spatio-temporal in nature, meaning that they can be indexed by their spatial locations and time stamps. Spatio-Temporal Statistics with R provides an accessible introduction to statistical analysis of spatio-temporal data, with hands-on applications of the statistical methods using R Labs found at the end of each chapter. The book fills a void in the literature and available software, providing

a bridge for students and researchers alike who wish to learn the basics of spatio-temporal statistics.

Chapman and Hall/CRC

Market: Statistics

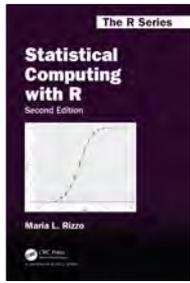
January 2019: 254 x 178: 376pp

Hb: 978-1-138-71113-6: **£46.99**

eBook: 978-1-351-76972-3

* For full contents and more information, visit: www.crcpress.com/9781138711136

2nd Edition

Statistical Computing with R

Maria L. Rizzo, Bowling Green State University, Ohio, USA

Series: Chapman & Hall/CRC The R Series

Computational statistics and statistical computing are two areas that employ computational, graphical, and numerical approaches to solve statistical problems, making the versatile R language an ideal computing environment for these fields. This second edition continues to encompass the traditional core material of computational statistics, with an emphasis on using the R language via an examples-based approach. It includes R code for all examples and R notes to help explain the R programming concepts. This edition also features a new chapter on nonparametric regression and smoothing.

Chapman and Hall/CRC

Market: Statistics

January 2019: 229 x 152: 474pp

Hb: 978-1-466-55332-3: **£59.99**

Prev. Ed Hb: 978-1-584-88545-0

* For full contents and more information, visit: www.crcpress.com/9781466553323

**Time Series Clustering and Classification**

Elizabeth Ann Maharaj, Pierpaolo D'Urso and Jorge Caiado, Centre for Applied Mathematics and Economics and ISEG, University of Lisbon, Portugal

Series: Chapman & Hall/CRC Computer Science & Data Analysis

The beginning of the age of artificial intelligence and machine learning has created new challenges and opportunities for data analysts, statisticians, mathematicians, econometricians, computer scientists and many others. At the root of these techniques are algorithms and methods for clustering and classifying different types of large datasets, including time series data. This book includes relevant developments on observation-based, feature-based and model-based traditional and fuzzy clustering methods, feature-based and model-based classification methods, and machine learning methods. It presents a broad and self-contained overview of techniques for both researchers and students.

Chapman and Hall/CRC

Market: Statistics

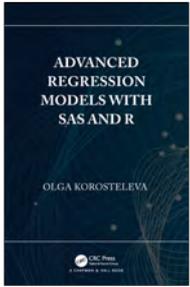
February 2019: 254 x 178: 240pp

Hb: 978-1-498-77321-8: **£92.00**

eBook: 978-0-429-05826-4

* For full contents and more information, visit: www.crcpress.com/9781498773218

Advanced Regression Models with SAS and R



Olga Korosteleva, California State University, Long Beach, USA

The material covered by this book consists of a collection of regression models beyond linear regression. The linear regression model is presented in the first chapter in order to refresh the reader's memory, emphasize certain points, and set the notation. The subsequent chapters talk about models for categorical data, count data, proportions, longitudinal data, hierarchical data, and others.

Chapman and Hall/CRC

Market: Statistics

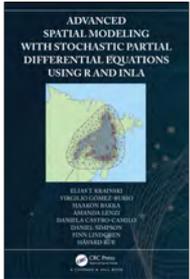
December 2018: 254 x 178: 14pp

Hb: 978-1-138-04901-7: £74.99

eBook: 978-1-315-16982-8

* For full contents and more information, visit: www.crcpress.com/9781138049017

Advanced Spatial Modeling with Stochastic Partial Differential Equations Using R and INLA



Elias T. Krainski, Universidade Federal do Parana, Curitiba, Brazil, Virgilio Gómez-Rubio, Universidad de Castilla-La Mancha, Albacete, Spain, Haakon Bakka, Amanda Lenzi, Daniela Castro-Camilo, Daniel Simpson, Finn Lindgren, The University of Edinburgh and Håvard Rue

The Integrated Nested Laplace Approximation is a popular method for approximate Bayesian inference. INLA is an alternative to other methods for Bayesian inference, such as Markov Chain Monte Carlo, that are more computationally demanding. In addition, the R-INLA package for the R statistical software provides a way to fit such models in practice. The aim of this book is to provide an introduction and a tutorial to spatial modeling with INLA using the SPDE approach which is a novel

method to model continuous spatial processes with important computational advantages. The book will be filled with reproducible examples in R.

Chapman and Hall/CRC

Market: Statistics

December 2018: 235 x 156: 284pp

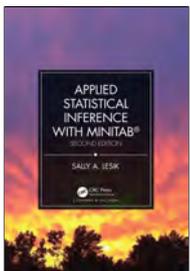
Hb: 978-1-138-36985-6: £88.99

eBook: 978-0-429-03189-2

* For full contents and more information, visit: www.crcpress.com/9781138369856

2nd Edition

Applied Statistical Inference with MINITAB®



Sally A. Lesik, Central Connecticut State University, New Britain, USA

This book covers material that is typically presented in an intermediate course in statistics at the undergraduate level and a first course in applied statistics at the graduate level. Topics include basic statistical inference, regression, and ANOVA. More advanced topics include non-parametric statistics, logistic regression, and goodness-of-fit tests. One key feature of this book is that it is written to provide readers with the foundation necessary to study more advanced topics in statistics.

Chapman and Hall/CRC

December 2018: 254 x 178: 478pp

Hb: 978-1-498-77998-2: £94.99

eBook: 978-0-429-44495-1

Prev. Ed Hb: 978-1-420-06583-1

* For full contents and more information, visit: www.crcpress.com/9781498779982

Combinatorial Inference in Geometric Data Analysis

Brigitte Le Roux, MAP5 - Université Paris Descartes, France, Solène Bienaise, Coheris Spad, Suresnes, France and Jean-Luc Durand, Université Paris 13, Villetaneuse, France

Series: *Chapman & Hall/CRC Computer Science & Data Analysis*

Geometric Data Analysis designates the approach of Multivariate Statistics that conceptualizes the set of observations as a Euclidean cloud of points. *Combinatorial Inference in Geometric Data Analysis* gives an overview of multidimensional statistical inference methods applicable to clouds of points that make no assumption on the process of generating data or distributions, and that are not based on random modelling but on permutation procedures recasting in a combinatorial framework.

Chapman and Hall/CRC

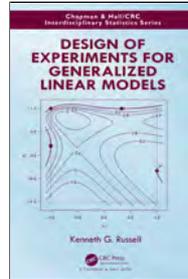
Market: Statistics

February 2019: 235 x 156: 256pp

Hb: 978-1-498-78161-9: £92.00

* For full contents and more information, visit: www.crcpress.com/9781498781619

Design of Experiments for Generalized Linear Models



Kenneth G. Russell, National Institute for Applied Statistical Research Australia, University of Wollongong

Series: *Chapman & Hall/CRC Interdisciplinary Statistics*

This is the first book focusing specifically on the design of experiments for GLMs. Much of the research literature on this topic is at a high mathematical level, and without any information on computation. This book explains the motivation behind various techniques, reduces the difficulty of the mathematics, or moves it to one side if it cannot be avoided, and gives examples of how to write and run computer programs using R. It is aimed at readers who have done elementary differentiation and understand minimal matrix algebra, and have familiarity with R. It equips professional statisticians to read the

research literature.

Chapman and Hall/CRC

Market: Statistics

December 2018: 229 x 152: 226pp

Hb: 978-1-498-77313-3: £74.99

eBook: 978-0-429-05748-9

* For full contents and more information, visit: www.crcpress.com/9781498773133

Geostatistical modelling with R

Patrick Brown, University of Toronto, Canada

Series: *Chapman & Hall/CRC Texts in Statistical Science*

This book provides a comprehensive reference for solving scientific problems with the generalized linear geostatistical model (GLGM), with an emphasis on demonstrating the accompanying software through examples. The key features of the GLGM are observed data points being independent of each other conditional on an unobserved spatial surface, values of the underlying spatial surface follow a multivariate normal distribution, and the surface is the sum of explanatory variables (fixed effects) and a random term.

Chapman and Hall/CRC

May 2019: 235 x 156: 250pp

Hb: 978-1-482-24377-2: £61.99

eBook: 978-1-482-24378-9

* For full contents and more information, visit: www.crcpress.com/9781482243772

Handbook of Biomarkers and Precision Medicine

Edited by **Claudio Carini**, Pfizer, Cambridge, Massachusetts, USA, **Mark Fidock**, AstraZeneca Limited, Melbourn, Hertfordshire, United Kingdom and **Alain van Gool**, Radboud University, Medical Center, Translational Metabolic Laboratory, Nijmegen, The Netherlands

Provides perspective, covers recent developments in technologies that have enabled the expanded use of biomarkers, discusses biomarker characterization and validation, and applications throughout the discovery-development continuum, including Companion Diagnostic (CDX) development. In addition, the book discusses types of design considerations and statistical approaches for biomarker informed clinical trials. Importantly, several case studies of biomarkers that have helped or hindered decision making will be presented.

Chapman and Hall/CRC

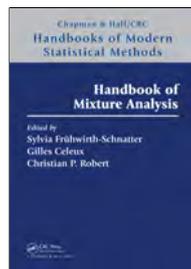
Market: Statistics

April 2019: 279 x 216: 544pp

Hb: 978-1-498-76258-8: **£220.00**

* For full contents and more information, visit: www.crcpress.com/9781498762588

Handbook of Mixture Analysis



Edited by **Sylvia Frühwirth-Schnatter**, University of Vienna, Austria, **Gilles Celeux**, Université Paris-Sud, France and **Christian P. Robert**, Université Paris-Dauphine

Series: Chapman & Hall/CRC Handbooks of Modern Statistical Methods

Mixture models have been around for over 150 years, and they are found in many branches of statistical modelling, as a versatile and multifaceted tool. They can be applied to a wide range of data: univariate or multivariate, continuous or categorical, cross-sectional, time series, networks, and much more. Mixture analysis is a very active research topic in statistics and machine learning, with new developments in methodology and

applications taking place all the time. The *Handbook of Mixture Analysis* is a very timely publication, presenting a broad overview of the methods and applications of this important field of research. It covers a wide array of topics,

Chapman and Hall/CRC

Market: Statistics

December 2018: 254 x 178: 498pp

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eBook: 978-0-429-05591-1

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Abdelmonem Affi, University of California, Los Angeles, USA, **Susanne May**, University of Washington, Seattle, USA, **Robin Donatello**, UCLA and **Virginia A. Clark**, Consultant, Sequim, Washington, USA

Series: Chapman & Hall/CRC Texts in Statistical Science

This is the sixth edition of a popular textbook on multivariate analysis. Well-regarded for its practical and accessible approach, with excellent examples and good guidance on computing, the book is particularly popular for teaching outside statistics, i.e. in epidemiology, social science, business, etc. The sixth edition has been updated with a new chapter on data visualization, and many new updates and references throughout. There are new examples using new datasets, and the exercises have been expanded. This new edition will enable the book to continue as one of the leading textbooks in the area, particularly for non-statisticians.

Chapman and Hall/CRC

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September 2019: 254 x 178: 540pp

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Prev. Ed Hb: 978-1-439-81680-6

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Bayesian Cost-Effectiveness Analysis of Medical Treatments

Elias Moreno, University of Granada, Francisco Jose Vazquez-Polo, Dept of Quantitative Methods, University of Las Palmas de Gran Canaria Campus de Tafira and Miguel Angel Negrin-Hernandez, University of Las Palmas de Gran Canaria Campus de Tafira

Series: *Chapman & Hall/CRC Biostatistics Series*

This book deals with the statistical analysis of the cost-effectiveness of medical treatments. The aim of the book is to formulate the cost-effectiveness analysis as a statistical decision problem, to identify the sources of uncertainty of the problem, and to give an overview of the frequentist and Bayesian statistical approaches for estimating these uncertainties. Basic notions on decision theory such as space of decisions, space of nature, utility function of a decision and optimal decisions, will be explained in detail using easy to read mathematics.

Chapman and Hall/CRC

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Cause and Effect Business Analytics

For Big and Small Data

Dominique Haughton, Bentley University, Waltham, Massachusetts, USA, Jonathan Haughton, Suffolk University, Boston, Massachusetts, USA and Victor S. Y. Lo, Bentley University, Waltham, Massachusetts, USA

Series: *Chapman & Hall/CRC Computer Science & Data Analysis*

Business analytics is the application of statistical and quantitative analysis, as well as formal modeling, to decision making. This book examines under what circumstances and with which techniques one can reasonably infer cause and effect in a business setting and use the insight to drive business decisions. The book is rooted in realistic and important cases used to illustrate the importance of thinking clearly about causality and applying the techniques of business analytics.

Chapman and Hall/CRC

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Hb: 978-1-482-21647-9: **£46.99**

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Data Science with Julia



Paul D. McNicholas, McMaster University and Peter Tait, McMaster University Hamilton, ON

This book introduces data science using the Julia programming language. The focus is on providing the essentials and laying a solid foundation for the reader. First, the core components of Julia are covered as well as a few packages relevant to the input, manipulation and representation of data. A chapter is dedicated to R interoperability using RCall. From there, data visualization using the Gadfly package is outlined and demonstrated. Methods will be demonstrated using existing Julia machine learning packages. All the material will be tied together in a final chapter.

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Market: Statistics

December 2018: 216 x 140: 220pp

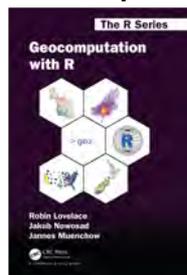
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Robin Lovelace, University of Leeds, UK, Jakob Nowosad, University of Cincinnati and Jannes Muenchow

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Handbook of Environmental and Ecological Statistics



Edited by Alan E. Gelfand, Duke University, Durham, North Carolina, Montserrat Fuentes, North Carolina State University, Raleigh, Jennifer A. Hoeting and Richard Lyttleton Smith

Series: *Chapman & Hall/CRC Handbooks of Modern Statistical Methods*

This handbook focuses on the enormous literature applying statistical methodology and modelling to environmental and ecological processes. The statistics community has become increasingly interdisciplinary, bringing a large collection of modern tools to all areas of application in the environmental processes. In addition, the environmental community has

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Market: Statistics

January 2019: 254 x 178: 1036pp

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Health Economic Evaluation for Cancer Trials Using Clinical Trial Data

Iffekhar Khan, King's College, London, Zahid Bashir, Haemato-Oncology, Welwyn Garden City, UK and Ralph Crott

Series: *Chapman & Hall/CRC Biostatistics Series*

This is the first book on the design and analysis of not only clinical trials but also how observational non-interventional data using clinical data is applied to economic evaluation and re-imbursement in the context of Cancer. The authors assume the reader has no knowledge of economic evaluation and has a rudimentary knowledge of quantitative/statistical methods but the reader works in the field of cancer research either as a medical oncologist, statistician, epidemiologist, health economist or related cancer health care worker. This book is a non technical exposition of economic evaluation and no knowledge of advanced statistical methods is assumed.

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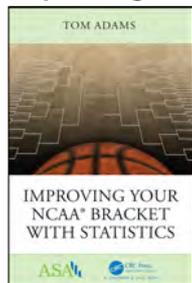
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Tom Adams

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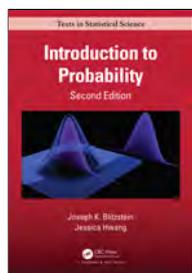
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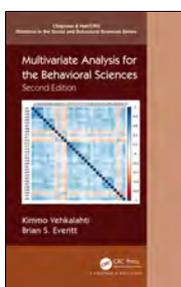
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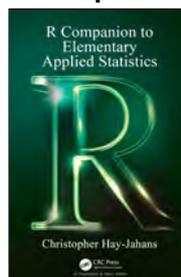
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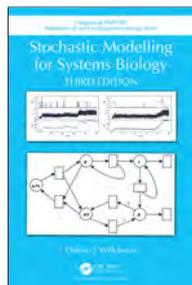
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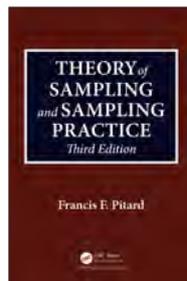
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January 2019: 254 x 178: 694pp

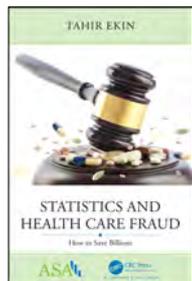
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A

Advanced Discrete Mathematics 2
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 Analysis of Ecological Data Using R, The 19
 Analysis of Longitudinal Data by Example 13
 Analysis on Function Spaces of Musielak-Orlicz Type 7
 Analytic Methods for Coagulation-Fragmentation Models, Volume 1 6
 Applied Statistical Inference with MINITAB®, Second Edition 15

B

Bayesian Cost-Effectiveness Analysis of Medical Treatments 17

C

Cause and Effect Business Analytics 17
 Certain Number-Theoretic Episodes In Algebra, Second Edition 4
 Certified Security by Design Using Higher Order Logic 7
 Combinatorial Inference in Geometric Data Analysis 15
 Computational Approach to Statistical Learning, A 13
 Computational Complexity of Counting and Sampling 5
 Computational Methods for Approximation of Large-Scale Descriptor Systems 2
 Computer Algebra 5
 Curved-Folding Origami Design 4

D

Data Science with Julia 17
 Data Visualization 13
 Design of Experiments for Generalized Linear Models 15

E

Elementary Differential Equations 9
 Entrepreneurial Complexity 4
 Exploring Linear Algebra 3

F

First Course in Fuzzy Logic, A 7
 First Course in Logic, A 7
 Fundamentals of Linear Algebra 7
 Fundamentals of Partial Differential Equations 6

G

Generalized Fractional Order Differential Equations Arising in Physical Models 2
 Generalized Trigonometric and Hyperbolic Functions 8
 Geocomputation with R 17
 Geostatistical modelling with R 15

H

Handbook of Biomarkers and Precision Medicine 16
 Handbook of Conformal Mappings and Applications 2
 Handbook of Environmental and Ecological Statistics 17
 Handbook of Mixture Analysis 16
 Handbook of the Tutte Polynomial 9
 Health Economic Evaluation for Cancer Trials Using Clinical Trial Data 17
 Hex 8
 Hormones as Tokens of Selection 9
 How to Be Successful as a Consulting Biostatistician in Industry 11

I

Improving Your NCAA® Bracket with Statistics 18
 Innovative Strategies, Statistical Solutions and Simulations for Modern Clinical Trials 11
 Interest Rate Modeling 9
 Introduction to Probability, Second Edition 18

L

Lessons in Play 9
 Likelihood Methods in Biology and Ecology 12
 Linear Algebra 3

M

Mathematics at the Meridian 5
 MATLAB Handbook with Applications to Mathematics, Science, Engineering, and Finance 5
 Measuring Crime 18
 Mixture Modelling for Medical and Health Sciences 18
 Model-based Geostatistics for Global Public Health 12
 Multivariate Analysis for the Behavioral Sciences, Second Edition 18

N

Nonlinear Systems and Their Remarkable Mathematical Structures 2
 Novel Methods for Solving Linear and Nonlinear Integral Equations 9

O

Odds of Justice, The 20

P

Pencils of Cubics and Algebraic Curves in the Real Projective Plane 3
 Platform Trial Designs in Drug Development 11
 Practical Multivariate Analysis, Sixth Edition 16
 Practical R for Mass Communication and Journalism 13

R

R Companion to Elementary Applied Statistics 18

R Graphics, Third Edition 13
 Research Methodology 19

S

Sequential Models of Mathematical Physics 2
 Spatio-Temporal Statistics with R 13
 Statistical Computing with R, Second Edition 14
 Statistics and Health Care Fraud 20
 Statistics in Engineering 12
 Stochastic Modelling for Systems Biology, Third Edition 19

T

Textual Statistics with R 19
 Theory of Sampling and Sampling Practice, Third Edition 19
 Time Series Clustering and Classification 14

V

Variational Techniques for Elliptic Partial Differential Equations 5
 Volume Inequalities for Arrangements of Convex Bodies 10

A

Adams, Tom	18
Afifi, Abdelmonem	16
Albert, Michael	9
Antonišević, Zoran	11
Arangala, Crista	3
Arnold, Taylor	13

B

Bairagi, Vinayak	19
Banasiak, Jacek	6
Bezdek, Karoly	10
Blitzstein, Joseph K.	18
Brimacombe, Michael	12
Brown, Patrick	15
Bécue-Bertaut, Mónica	19

C

Carini, Claudio	16
Chahal, J.S.	7
Chang, Mark	11
Chin, Shiu-Kai	7

D

David Baez-Lopez, Jose Miguel	5
Diggle, Peter J.	12

E

Edwards, Thomas C.	19
Ekin, Tahir	20
Ellis-Monaghan, Joanna A.	9
Euler, Norbert	2

F

Fiedler - Le Touzé, Séverine	3
Flood, Raymond Gerard	5
Fruhvirth-Schnatter, Sylvia	16

G

Gelfand, Alan E.	17
Grant, Robert	13
Gray, Mary	20

H

Haughton, Dominique	17
Hay-Jahans, Christopher	18
Hayward, Ryan B.	8

J

Jodlbauer, Herbert	4
--------------------------	---

K

Khan, Iftekhar	17
Kirkwood, James R.	3
Korosteleva, Olga	15
Krainski, Elias	15
Kythe, Prem K.	2

L

Lamagna, Edmund A.	5
Lawson, Mark Verus	7
Le Roux, Brigitte	15
Lesik, Sally A.	15
Lohr, Sharon L.	18
Lovelace, Robin	17

M

Machlis, Sharon	13
Maharaj, Elizabeth Ann	14
Malkowsky, Eberhard	7
McNicholas, Paul D.	17
Mendez, Osvaldo	7
Mesenbrink, Peter	11
Metcalfe, Andrew	12

Mickens, Ronald E.	8
Miklos, Istvan	5
Mitani, Jun	4
Moreno, Elias	17
Murrell, Paul	13

N

Ng, Shu-Kay	18
Nguyen, Hung T.	7

P

Pitard, Francis F.	19
-------------------------	----

R

R, Sivaramakrishnan	4
Ray, Santanu Saha	2
Ray, Santanu Saha	9
Rizzo, Maria L.	14
Roberts, Charles	9
Russell, Kenneth G.	15

S

Sayas, Francisco J.	5
Serovajsky, Simon	2
Sinha, Rajen Kumar	6
Sridharan, Sriraman	2

U

Uddin, Mohammad Monir	2
-----------------------------	---

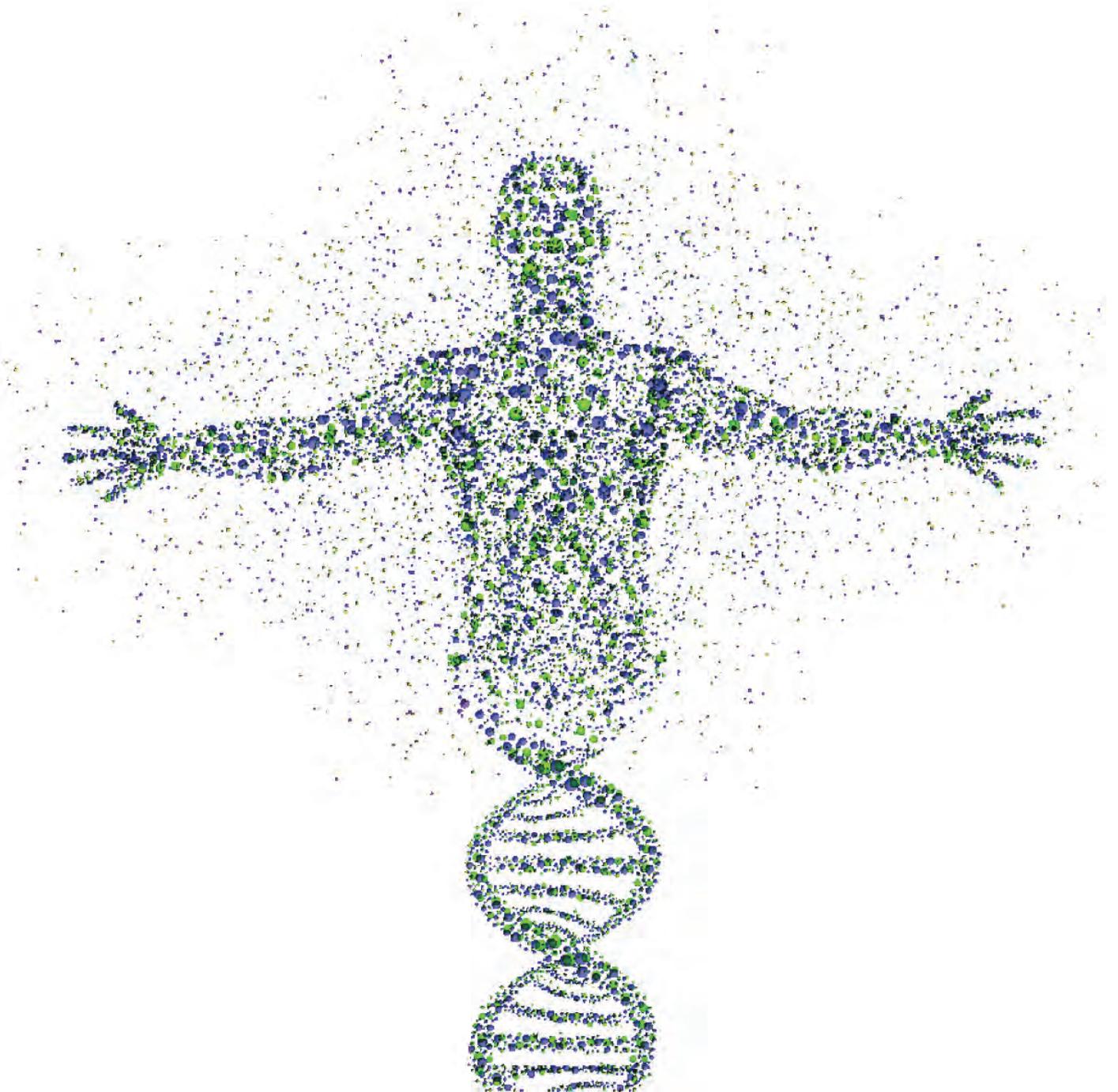
V

van den Berg, Hugo	9
Vehkalhti, Kimmo	18

W

Wang, You-Gan	13
Wikle, Christopher K.	13
Wilkinson, Darren J.	19
Wu, Lixin	9

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