

This highly visual introductory textbook provides a rigorous mathematical foundation for all solution methods and reinforces ties to physical motivation.

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Real Analysis Modern Techniques and Their Applications John Wiley & Sons

Written by a team of international experts, Extremes and Recurrence in Dynamical Systems presents a unique point of view on the mathematical theory of extremes and on its applications in the natural and social sciences. Featuring an interdisciplinary approach to new concepts in pure and applied mathematical research, the book skillfully combines the areas of statistical mechanics, probability theory, measure theory, dynamical systems, statistical inference, geophysics, and software application. Emphasizing the statistical mechanical point of view, the book introduces robust theoretical embedding for the application of extreme value theory in dynamical systems. Extremes and Recurrence in Dynamical Systems also features: • A careful examination of how a dynamical system can serve as a generator of stochastic processes • Discussions on the applications of statistical inference in the theoretical and heuristic use of extremes • Several examples of analysis of extremes in a physical and geophysical context • A final summary of the main results presented along with a guide to future research projects • An appendix with software in Matlab® programming language to help readers to develop further understanding of the presented concepts Extremes and Recurrence in Dynamical Systems is ideal for academics and practitioners in pure and applied mathematics, probability theory, statistics, chaos, theoretical and applied dynamical systems, statistical mechanics, geophysical fluid dynamics, geosciences and complexity science. VALERIO LUCARINI, PhD, is Professor of Theoretical Meteorology at the University of Hamburg, Germany and Professor of Statistical Mechanics at the University of Reading, UK. DAVIDE FARANDA, PhD, is Researcher at the Laboratoire des sciences du climat et de l'environnement, IPSL, CEA Saclay, Université Paris-Saclay, Gif-sur-Yvette, France. ANA CRISTINA GOMES MONTEIRO MOREIRA DE FREITAS, PhD, is Assistant Professor in the Faculty of Economics at the University of Porto, Portugal. JORGE MIGUEL MILHAZES DE FREITAS, PhD, is Assistant Professor in the Department of Mathematics of the Faculty of Sciences at the University of Porto, Portugal. MARK HOLLAND, PhD, is Senior Lecturer in Applied Mathematics in the College of Engineering, Mathematics and Physical Sciences at the University of Exeter, UK. TOBIAS KUNA, PhD, is Associate Professor in the Department of Mathematics and Statistics at the University of Reading, UK. MATTHEW NICOL, PhD, is Professor of Mathematics at the University of Houston, USA. MIKE TODD, PhD, is Lecturer in the School of Mathematics and Statistics at the University of St. Andrews, Scotland. SANDRO VAIENTI, PhD, is Professor of Mathematics at the University of Toulon and Researcher at the Centre de Physique Théorique, France.

This is an excellent textbook on analysis and it has several unique features: Proofs of heat kernel estimates, the Nash inequality and the logarithmic Sobolev inequality are topics that are seldom treated on the level of a textbook. Best constants in several inequalities, such as Young's inequality and the logarithmic Sobolev inequality, are also included. A thorough treatment of rearrangement inequalities and competing symmetries appears in book form for the first time. There is an extensive treatment of potential theory and its applications to quantum mechanics, which, again, is unique at this level. Uniform convexity of L^p space is treated very carefully. The presentation of this important subject is highly unusual for a textbook. All the proofs provide deep insights into the theorems. This book sets a new standard for a graduate textbook in analysis. --Shing-Tung Yau, Harvard University For some number of years, Rudin's "Real and Complex", and a few other analysis books, served as the canonical choice for the book to use, and to teach from, in a first year grad analysis course. Lieb-Loss offers a refreshing alternative: It begins with a down-to-earth intro to measure theory, L^p and all that ... It aims at a wide range of essential applications, such as the Fourier transform, and series, inequalities, distributions, and Sobolev spaces--PDE, potential theory, calculus of variations, and math physics (Schrodinger's equation, the hydrogen atom, Thomas-Fermi theory ... to mention a few). The book should work equally well in a one-, or in a two-semester course. The first half of the book covers the basics, and the rest will be great for students to have, regardless of whether or not it gets to be included in a course. --Palle E. T. Jorgensen, University of Iowa

?:Basic algebra. -- ?: W. H. Freeman, 1974

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