



Palle E.T. Jorgensen
Analysis and Probability
Wavelets, Signals, Fractals

This book, combining analysis and tools from mathematical probability, focuses on a systematic and novel presentation of recent trends in pure and applied mathematics: the emergence of three fields, wavelets, signals and fractals. The unity of basis constructions and their expansions is emphasized as the starting point for the development of bases that are computationally efficient for use in several areas from wavelets to fractals.

The book brings together tools from engineering and math, especially from signal- and image processing, and from harmonic analysis and operator theory. The presentation is aimed at graduate students, as well as users from a diverse spectrum of applications.

Key features:

- A hands-on approach for students, including tutorials and numerous exercises;
- Excellent motivation throughout;
- New pedagogical features: glossary of terms, their use in mathematics and in engineering, help for cross-audiences, image processing, visual presentation of key algorithms, structure and geometry of big matrix computations, explanation of uses of the theory in applications outside of mathematics;
- Includes more than 50 figures with captions, illustrating the main ideas, plus engineering diagrams, graphic renditions of algorithms, and separate illustrations;
- Separate sections in the book explain engineering terms to mathematicians, and operator theory to engineers;
- Each chapter concludes with a helpful guide to the literature allowing students to follow up on the topics in the book.

Palle E.T. Jorgensen is a Professor of Mathematics at the University of Iowa, and has held positions at Stanford University, the University of Pennsylvania, and Aarhus University. This book is based in part on interdisciplinary courses that he has taught over the last several years, and on his work with his current and former students. His most recent book was written jointly with Ola Bratteli and is entitled *Wavelets through a Looking Glass*, © 2002 Birkhäuser Boston.

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Graduate Texts in Mathematics

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