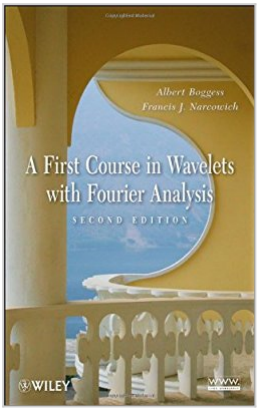

A First Course in Wavelets with Fourier Analysis

By Albert Boggess, Francis J. Narcowich

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A comprehensive, self-contained treatment of Fourier analysis and wavelets—now in a new edition

Through expansive coverage and easy-to-follow explanations, A *First Course in Wavelets with Fourier Analysis*, Second Edition provides a self-contained mathematical treatment of Fourier analysis and wavelets, while uniquely presenting signal analysis applications and problems. Essential and fundamental ideas are presented in an effort to make the book accessible to a broad audience, and, in addition, their applications to signal processing are kept at an elementary level.

The book begins with an introduction to vector spaces, inner product spaces, and other preliminary topics in analysis. Subsequent chapters feature:

- The development of a Fourier series, Fourier transform, and discrete Fourier analysis
- Improved sections devoted to continuous wavelets and two-dimensional wavelets
- The analysis of Haar, Shannon, and linear spline wavelets
- The general theory of multi-resolution analysis
- Updated MATLAB code and expanded applications to signal processing
- The construction, smoothness, and computation of Daubechies' wavelets
- Advanced topics such as wavelets in higher dimensions, decomposition and reconstruction, and wavelet transform

Applications to signal processing are provided throughout the book, most involving the filtering and compression of signals from audio or video. Some of these applications are presented first in the context of Fourier analysis and are later explored in the chapters on wavelets. New exercises introduce additional applications, and complete proofs accompany the discussion of each presented theory. Extensive appendices outline more advanced proofs and partial solutions to exercises as well as updated MATLAB routines that supplement the presented examples.

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"The discussions of applications avoid the deep jargon of signal processing … accessible to a wider audience." (*Book News*, December 2009)

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ALBERT BOGGESS, PhD, is Professor of Mathematics at Texas A&M University. Dr. Boggess has over twenty-five years of academic experience and has authored numerous publications in his areas of research interest, which include overdetermined systems of partial differential equations, several complex variables, and harmonic analysis.

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