

Contents

3469

Contributors	ix
Preface	xiii

Part I. Multiresolution and Multilevel Analyses

Non-stationary Multiscale Analysis <i>Albert Cohen</i>	3
The Spectral Theory of Multiresolution Operators and Applications <i>Peter Niels Heller and Raymond O. Wells, Jr.</i>	13
Multiresolution Analysis, Haar Bases and Wavelets on Riemannian Manifolds <i>Stephan Dahlke</i>	33
Orthonormal Cardinal Functions <i>T. N. T. Goodman and Charles A. Micchelli</i>	53

Part II. Wavelet Transforms

Some Remarks on Wavelet Representations and Geometric Aspects <i>Bruno Terrésani</i>	91
A Matrix Approach to Discrete Wavelets <i>Jaroslav Kautsky and Radka Turcajová</i>	117
A Unified Approach to Periodic Wavelets <i>Gerlind Plonka and Manfred Tasche</i>	137

Part III. Spline Wavelets

Spline Wavelets over \mathbb{R} , \mathbb{Z} , $\mathbb{R}/\mathbb{N}\mathbb{Z}$, and $\mathbb{Z}/\mathbb{N}\mathbb{Z}$ <i>Gabriele Steidl</i>	155
A Practice of Data Smoothing by B-Spline Wavelets <i>Susumu Sakakibara</i>	179
L-Spline Wavelets <i>Tom Lyche and Larry L. Schumaker</i>	197
Wavelets and Frames on the Four-Directional Mesh <i>Charles K. Chui, Kurt Jetter, and Joachim Stöckler</i>	213

Part IV. Other Mathematical Tools for Time-Frequency Analysis

On Minimum Entropy Segmentation <i>David L. Donoho</i>	233
Adaptive Time-Frequency Approximations with Matching Pursuits <i>Geoffrey Davis, Stéphane Mallat, and Zhifeng Zhang</i>	271
Getting Around the Balian-Low Theorem Using Generalized Malvar Wavelets <i>Bruce W. Suter and Mark E. Oxley</i>	295
Time Scale Energetic Distribution <i>Guy Courbebaisse, Bernard Escudié, and Thierry Paul</i>	311

Part V. Wavelets and Fractals

Some Mathematical Results about the Multifractal Formalism for Functions <i>Stephane Jaffard</i>	325
Fractal Wavelet Dimensions and Time Evolution <i>Matthias Holschneider</i>	363

Part VI. Numerical Methods and Algorithms

Multiscale Methods for Pseudo-Differential Equations on Smooth Closed Manifolds <i>Wolfgang Dahmen, Siegfried Prössdorf, and Reinhold Schneider</i>	385
Wavelet Methods for the Numerical Solution of Boundary Value Problems on the Interval <i>Silvia Bertoluzza, Giovanni Naldi, and Jean Christophe Ravel</i>	425
On the Nodal Values of the Franklin Analyzing Wavelet <i>Dimitri Karayannakis</i>	449
Parallel Numerical Algorithms with Orthonormal Wavelet Packet Bases <i>Laura Baccheli Montefusco</i>	459
Representation of the Atomic Hartree-Fock Equations in the Wavelet Basis by Means of the BCR Algorithm <i>Patrick Fischer and Mireille Defranceschi</i>	495

Part VII. Applications

Efficiency Comparison of Wavelet Packet and Adapted Local Cosine Bases for Compression of a Two-dimensional Turbulent Flow <i>Mladen Victor Wickerhauser, Marie Farge, Eric Goirand, Eva Wesfreid, and Echeyde Cubillo</i>	509
--	-----

Wavelet Spectra of Buoyant Atmospheric Turbulence
Meinhard E. Mayer, Lonnie Hudgins, and Carl A. Friehe 533

Experimental Study of Inhomogeneous Turbulence in the Lower
Troposphere by Wavelet Analysis
*Aimé Druilhet, Jean-Luc Attié, Leonardo de Abreu Sá,
Pierre Durand, and Bruno Bénech* 543

Applications of Wavelet Transform for Seismic Activity Monitoring
Gabriella Olmo and Letizia Lo Presti 561

Mean Value Jump Detection: A Survey of Conventional and Wavelet
Based Methods
Aline Denjean and Francis Castanié 573

Comparison of Picture Compression Methods: Wavelet, Wavelet Packet,
and Local Cosine Transform Coding
Mladen Victor Wickerhauser 585

Subject Index 623