

# Contents

---

## Part 1. Wavelet Theory

---

### Chapter 1: Approximation and Fourier Analysis

Local Smoothness Conditions on a Function Which Guarantee Convergence of Double Walsh-Fourier Series of This Function <i>S.K. Bloshanskaya and I.L. Bloshanskii</i> .....	3
Linear Transformations of $\mathbb{R}^N$ and Problems of Convergence of Fourier Series of Functions Which Equal Zero on Some Set <i>I.L. Bloshanskii</i> .....	13
Sidon Type Inequalities for Wavelets <i>N.A. Sheikh</i> .....	25
Almansi Decomposition for Dunkl-Helmholtz Operators <i>G. Ren and H.R. Malonek</i> .....	35
An Uncertainty Principle for Operators <i>M.G. Cowling and M. Sundari</i> .....	43
Uncertainty Principle for Clifford Geometric Algebras $Cl_{n,0}$ , $n = 3 \pmod{4}$ Based on Clifford Fourier Transform <i>E.S.M. Hitzer and B. Mawardi</i> .....	47

### Chapter 2: Construction of Wavelets and Frame Theory

Orthogonal Wavelet Vectors in a Hilbert Space <i>H.-X. Cao and B.-M. Yu</i> .....	59
Operator Frames for $B(\mathcal{H})$ <i>C.-Y. Li and H.-X. Cao</i> .....	67
On the Stability of Multi-wavelet Frames <i>G. Wang and Z. Cheng</i> .....	83
Biorthogonal Wavelets Associated with Two-Dimensional Interpolatory Function <i>J. Yang, Y.Y. Tang, Z. Cheng and X. You</i> .....	91
Parameterization of Orthogonal Filter Bank with Linear Phase <i>X. Feng, Z. Cheng and Z. Yang</i> .....	99

On Multivariate Wavelets with Trigonometric Vanishing Moments <i>Y. Li, Z.-D. Deng and Y.-C. Liang</i> .....	107
Directional Wavelet Analysis with Fourier-Type Bases for Image Processing <i>Z. Yao, N. Rajpoot and R. Wilson</i> .....	123
Unitary Systems and Wavelet Sets <i>D.R. Larson</i> .....	143
Clifford Analysis and the Continuous Spherical Wavelet Transform <i>P. Cerejeiras, M. Ferreira and U. Kähler</i> .....	173
Clifford-Jacobi Polynomials and the Associated Continuous Wavelet Transform in Euclidean Space <i>F. Brackx, N. De Schepper and F. Sommen</i> .....	185
<b>Chapter 3: Fractal and Multifractal Theory, Wavelet Algorithm, Wavelet in Numerical Analysis</b>	
Wavelet Leaders in Multifractal Analysis <i>S. Jaffard, B. Lashermes and P. Abry</i> .....	201
Application of Fast Wavelet Transformation in Parametric System Identification <i>K. Markwardt</i> .....	247
Image Denoising by a Novel Digital Curvelet Reconstruction Algorithm <i>J. Bai and X.-C. Feng</i> .....	255
Condition Number for Under-Determined Toeplitz Systems <i>H. Diao and Y. Wei</i> .....	263
Powell–Sabin Spline Prewavelets on the Hexagonal Lattice <i>J. Maes and A. Bultheel</i> .....	273
<b>Chapter 4: Time-Frequency Analysis, Adaptive Representation of Nonlinear and Non-stationary Signals</b>	
Time-Frequency Aspects of Nonlinear Fourier Atoms <i>Q. Chen, L. Li and T. Qian</i> .....	287
Mono-components for Signal Decomposition <i>T. Qian</i> .....	299

Signal-Adaptive Aeroelastic Flight Data Analysis with HHT <i>M.J. Brenner, S.L. Kukreja and R.J. Prazenica</i> .....	321
An Adaptive Data Analysis Method for Nonlinear and Nonstationary Time Series: The Empirical Mode Decomposition and Hilbert Spectral Analysis <i>N.E. Huang</i> .....	363

---

## Part 2. Wavelet Applications

---

Transfer Colors from CVHD to MRI Based on Wavelets Transform <i>X. Tian, X. Li, Y. Sun and Z. Tang</i> .....	381
Medical Image Fusion by Multi-resolution Analysis of Wavelets Transform <i>X. Li, X. Tian, Y. Sun and Z. Tang</i> .....	389
Salient Building Detection from a Single Nature Image via Wavelet Decomposition <i>Y. Qu, C. Li, N. Zheng, Z. Yuan and C. Ye</i> .....	397
SAR Images Despeckling via Bayesian Fuzzy Shrinkage Based on Stationary Wavelet Transform <i>Y. Wu, X. Wang and G. Liao</i> .....	407
Super-Resolution Reconstruction Using Haar Wavelet Estimation <i>C.S. Tong and K.T. Leung</i> .....	419
The Design of Hilbert Transform Pairs in Dual-Tree Complex Wavelet Transform <i>F. Yan, L. Cheng and H. Wang</i> .....	431
Supervised Learning Using Characteristic Generalized Gaussian Density and Its Application to Chinese Materia Medica Identification <i>S.K. Choy and C.S. Tong</i> .....	443
A Novel Algorithm of Singular Points Detection for Fingerprint Images <i>T. Tan and J. Huang</i> .....	453
Wavelet Receiver: A New Receiver Scheme for Doubly-Selective Channels <i>G. Shi and S. Peng</i> .....	463
Face Retrieval with Relevance Feedback Using Lifting Wavelets Features <i>C.F. Wong, J. Zhu, M.I. Vai, P.U. Mak and W. Ye</i> .....	477

High-Resolution Image Reconstruction Using Wavelet Lifting Scheme <i>S. Pei, H. Feng and M. Du</i> .....	489
Multiresolution Spatial Data Compression Using Lifting Scheme <i>B. Pradhan, K. Sandeep, S. Mansor, A.R. Ramli and A.R.B.M. Sharif</i> .....	503
Ridgelet Transform as a Feature Extraction Method in Remote Sensing Image Recognition <i>Y. Ren, S. Wang, S. Yang and L. Jiao</i> .....	515
Analysis of Frequency Spectrum for Geometric Modeling in Digital Geometry <i>Z. Cai, H. Ma, W. Sun and D. Qi</i> .....	525
Detection of Spindles in Sleep EEGs Using a Novel Algorithm Based on the Hilbert-Huang Transform <i>Z. Yang, L. Yang and D. Qi</i> .....	543
Wavelet-Domain Hidden Markov Tree Model with Localized Parameters for Image Denoising <i>M. Yang, Z. Xiao and S. Peng</i> .....	561

Wavelet Analysis and Applications

Qian, T.; Vai, M.L.; Xu, Y. (Eds.)

2007, XIV, 574 p., Hardcover

ISBN: 978-3-7643-7777-9

A product of Birkhäuser Basel