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Nota di contenuto	 Wavelets and their Applications; Table of Contents; Notations; Introduction; Chapter 1. A Guided Tour; 1.1. Introduction; 1.2. Wavelets; 1.2.1. General aspects; 1.2.2. A wavelet; 1.2.3. Organization of wavelets; 1.2.4. The wavelet tree for a signal; 1.3. An electrical consumption signal analyzed by wavelets; 1.4. Denoising by wavelets: before and afterwards; 1.5. A Doppler signal analyzed by wavelets; 1.6. A Doppler signal denoised by wavelets; 1.7. An electrical signal denoised by wavelets; 1.8. An image decomposed by wavelets; 1.8.1. Decomposition in tree form 1.8.2. Decomposition in compact form1.9. An image compressed by wavelets; 1.10. A signal compressed by wavelets; 1.11. A fingerprint compressed using wavelet packets; Chapter 2. Mathematical Framework; 2.1. Introduction; 2.2. From the Fourier transform to the Gabor transform; 2.3. The continuous transform in wavelets; 2.4. Orthonormal wavelet bases; 2.4.1. From continuous to discrete transform; 2.4.2. Multi-resolution analysis and orthonormal wavelet

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	 bases; 2.4.3. The scaling function and the wavelet; 2.5. Wavelet packets 2.5.1. Construction of wavelet packets; 2.6. Atoms of wavelet packets; 2.5.3. Organization of wavelet packets; 2.6. Biorthogonal wavelet bases; 2.6.1. Orthogonality and biorthogonality; 2.6.2. The duality raises several questions; 2.6.3. Properties of biorthogonal wavelets; 2.6.4. Semi-orthogonal wavelets; Chapter 3. From Wavelet Bases to the Fast Algorithm; 3.1. Introduction; 3.2. From orthonormal bases to the Mallat algorithm; 3.3. Four filters; 3.4. Efficient calculation of the coefficients; 3.5. Justification: projections and twin scales; 3.5.1. The decomposition phase 3.5.2. The reconstruction phase3.5.3. Decompositions and reconstructions of a higher order; 3.6. Implementation of the algorithm; 3.6.1. Initialization of the algorithm; 3.6.2. Calculation on finite sequences; 3.6.3. Extra coefficients; 3.7. Complexity of the algorithm; 3.8. From 1D to 2D; 3.9. Translation invariant transform; 3.9.1decimated DWT; 3.9.2. Calculation of the SWT; 3.9.3. Inverse SWT; Chapter 4. Wavelet Families; 4.1. Introduction; 4.2. What could we want from a wavelet?; 4.3. Synoptic table of the common families; 4.4. Some well known families 4.4.1. Orthogonal wavelets with compact support.4.1.1. Daubechies wavelets: dbN; 4.4.1.2. Symlets: symN; 4.4.1.3. Coiflets: coifN; 4.4.2. Biorthogonal wavelets with compact support: bior; 4.4.3. Orthogonal wavelets with non-compact support; 4.4.3.1. The Meyer wavelet: meyr; 4.4.3. Gaussian wavelets: btlm; 4.4.4. Z. The Morlet wavelet: morl; 4.4.4.3. Gaussian wavelets: gausN; 4.4.5. Complex wavelets without filters; 4.4.5.1. Complex Gaussian wavelets: cgau 4.4.5.2. Complex Morlet wavelets: cmorl
Sommario/riassunto	The last 15 years have seen an explosion of interest in wavelets with applications in fields such as image compression, turbulence, human vision, radar and earthquake prediction. Wavelets represent an area that combines signal in image processing, mathematics, physics and electrical engineering. As such, this title is intended for the wide audience that is interested in mastering the basic techniques in this subject area, such as decomposition and compression.