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Change Detection; 3.7 Geometric Image Operations; 3.7.1 Nearest Neighbor Interpolation; 3.7.2 Bilinear Interpolation; 3.7.3 Image Translation; 3.7.4 Image Rotation; 3.7.5 Image Zoom; Chapter 4. Basic Binary Image Processing; 4.1 Introduction; 4.2 Image Thresholding; 4.3 Region Labeling; 4.3.1 Region Labeling Algorithm; 4.3.2 Region Counting Algorithm; 4.3.3 Minor Region Removal Algorithm; 4.4 Binary Image Morphology; 4.4.1 Logical Operations; 4.4.2 Windows; 4.4.3 Morphological Filters; 4.4.4 Morphological Boundary Detection 4.5 Binary Image Representation and Compression 4.5.1 Run-Length Coding; 4.5.2 Chain Coding; Chapter 5. Basic Tools for Image Fourier Analysis; 5.1 Introduction; 5.2 Discrete-Space Sinusoids; 5.3 Discrete-Space Fourier Transform; 5.3.1 Linearity of DSFT; 5.3.2 Inversion of DSFT; 5.3.3 Magnitude and Phase of DSFT; 5.3.4 Symmetry of DSFT; 5.3.5 Translation of DSFT; 5.3.6 Convolution and the DSFT; 5.4 2D Discrete Fourier Transform (DFT); 5.4.1 Linearity and Invertibility of DFT; 5.4.2 Symmetry of DFT; 5.4.3 Periodicity of DFT; 5.4.4 Image Periodicity Implied by DFT 5.4.5 Cyclic Convolution Property of the DFT 5.4.6 Linear Convolution Using the DFT; 5.4.7 Computation of the DFT; 5.4.8 Displaying the DFT; 5.5 Understanding Image Frequencies and the DFT; 5.5.1 Frequency Granularity; 5.5.2 Frequency Orientation; 5.6 Related Topics in this Guide; Chapter 6. Multiscale Image Decompositions and Wavelets; 6.1 Overview; 6.2 Pyramid Representations; 6.2.1 Decimation and Interpolation; 6.2.2 Gaussian Pyramid; 6.2.3 Laplacian Pyramid; 6.3 Wavelet Representations; 6.3.1 Filter Banks; 6.3.2 Wavelet Decomposition; 6.3.3 Discrete Wavelet Bases 6.3.4 Continuous Wavelet Bases

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## Sommario/riassunto

This comprehensive and state-of-the art approach to image processing gives engineers and students a comprehensive introduction, and includes full coverage of key applications: image watermarking, fingerprint recognition, face recognition and iris recognition and medical imaging. To help learn the concepts and techniques, the book contains a CD-ROM of 70 highly interactive visual demonstrations. Key algorithms and their implementation details are included, as are the latest developments in the standards.\* A complete and modern introduction to the basic and intermediate concepts of image

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