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| Nota di contenuto | Image Processing Principles and Applications; Contents; Preface; 1 Introduction; 1.1 Fundamentals of Image Processing; 1.2 Applications of Image Processing; 1.2.1 Automatic Visual Inspection System; 1.2.2 Remotely Sensed Scene Interpretation; 1.2.3 Biomedical Imaging Techniques; 1.2.4 Defense surveillance; 1.2.5 Content-Based Image Retrieval; 1.2.6 Moving-Object Tracking; 1.2.7 Image and Video Compression; 1.3 Human Visual Perception; 1.3.1 Human Eyes; 1.3.2 Neural Aspects of the Visual Sense; 1.4 Components of an Image Processing System; 1.4.1 Digital Camera; 1.5 Organization of the book 1.6 How is this book different?1.7 Summary; References; 2 Image Formation and Representation; 2.1 Introduction; 2.2 Image formation; 2.2.1 Illumination; 2.2.2 Reflectance Models; 2.2.3 Point Spread Function; 2.3 Sampling and Quantization; 2.3.1 Image Sampling; 2.3.2 Image Quantization; 2.4 Binary Image; 2.4.1 Geometric Properties; 2.4.2 Chain code representation of a binary object; 2.5 Three- |

Dimensional Imaging; 2.5.1 Stereo Images; 2.5.2 Range Image Acquisition; 2.6 Image file formats; 2.7 Some Important Notes; 2.8 Summary; References; 3 Color and Color Imagery; 3.1 Introduction 3.2 Perception of Colors 3.3 Color Space Quantization and Just Noticeable Difference (JND); 3.4 Color Space and Transformation; 3.4.1 CMYK space; 3.4.2 NTSC or YIQ Color Space; 3.4.3 YCbCr Color Space; 3.4.4 Perceptually Uniform Color Space; 3.4.5 CIELAB color Space; 3.5 Color Interpolation or Demosaicing; 3.5.1 Nonadaptive Color Interpolation Algorithms; 3.5.2 Adaptive algorithms; 3.5.3 A Novel Adaptive Color Interpolation Algorithm; 3.5.4 Experimental Results; 3.6 Summary; Reference; 4 Image Transformation; 4.1 Introduction; 4.2 Fourier Transforms; 4.2.1 One-Dimensional Fourier Transform 4.2.2 Two-Dimensional Fourier Transform 4.2.3 Discrete Fourier Transform (DFT); 4.2.4 Transformation Kernels; 4.2.5 Matrix Form Representation; 4.2.6 Properties; 4.2.7 Fast Fourier Transform; 4.3 Discrete Cosine Transform; 4.4 Walsh-Hadamard Transform (WHT); 4.5 Karhunen-Loeve Transform or Principal Component Analysis; 4.5.1 Covariance Matrix; 4.5.2 Eigenvectors and Eigenvalues; 4.5.3 Principal Component Analysis; 4.5.4 Singular Value Decomposition; 4.6 Summary; References; 5 Discrete Wavelet Transform; 5.1 Introduction; 5.2 Wavelet Transforms; 5.2.1 Discrete Wavelet Transforms 5.2.2 Gabor filtering 5.2.3 Concept of Multiresolution Analysis; 5.2.4 Implementation by Filters and the Pyramid Algorithm; 5.3 Extension to Two-Dimensional Signals; 5.4 Lifting Implementation of the DWT; 5.4.1 Finite Impulse Response Filter and Z-transform; 5.4.2 Euclidean Algorithm for Laurent Polynomials; 5.4.3 Perfect Reconstruction and Polyphase Representation of Filters; 5.4.4 Lifting; 5.4.5 Data Dependency Diagram for Lifting Computation; 5.5 Advantages of Lifting-Based DWT; 5.6 Summary; References; 6 Image Enhancement and Restoration; 6.1 Introduction 6.2 Distinction between image enhancement and restoration

Sommario/riassunto

Image processing-from basics to advanced applications Learn how to master image processing and compression with this outstanding state-of-the-art reference. From fundamentals to sophisticated applications, Image Processing: Principles and Applications covers multiple topics and provides a fresh perspective on future directions and innovations in the field, including:

- * Image transformation techniques, including wavelet transformation and developments
- * Image enhancement and restoration, including noise modeling and filtering
- * Segmentation schemes, and classification and recogn