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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 Karhaunen-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:

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- * Image enhancement and restoration, including noise modeling and filtering
- * Segmentation schemes, and classification and recogn