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Nota di contenuto	BIOMEDICAL IMAGING; CONTENTS; Preface; Contributors; 1 Evaluation of Spectroscopic Images; 1.1 Introduction; 1.2 Data Analysis; 1.2.1 Similarity Measures; 1.2.2 Unsupervised Pattern Recognition; 1.2.2.1 Partitional Clustering; 1.2.2.2 Hierarchical Clustering; 1.2.2.3 Density-Based Clustering; 1.2.3 Supervised Pattern Recognition; 1.2.3.1 Probability of Class Membership; 1.3 Applications; 1.3.1 Brain Tumor Diagnosis; 1.3.2 MRS Data Processing; 1.3.2.1 Removing MRS Artifacts; 1.3.2.2 MRS Data Quantitation; 1.3.3 MRI Data Processing; 1.3.3.1 Image Registration; 1.3.4 Combining MRI and MRS Data 1.3.4.1 Reference Data Set1.3.5 Probability of Class Memberships; 1.3.6 Class Membership of Individual Voxels; 1.3.7 Classification of Individual Voxels; 1.3.8 Clustering into Segments; 1.3.9 Classification

of Segments; 1.3.10 Future Directions; References; 2 Evaluation of Tomographic Data; 2.1 Introduction; 2.2 Image Reconstruction; 2.3 Image Data Representation: Pixel Size and Image Resolution; 2.4 Consequences of Limited Spatial Resolution; 2.5 Tomographic Data Evaluation: Tasks; 2.5.1 Software Tools; 2.5.2 Data Access; 2.5.3 Image Processing; 2.5.3.1 Slice Averaging
2.5.3.2 Image Smoothing
2.5.3.3 Coregistration and Resampling; 2.5.4 Visualization; 2.5.4.1 Maximum Intensity Projection (MIP); 2.5.4.2 Volume Rendering and Segmentation; 2.5.5 Dynamic Tomographic Data; 2.5.5.1 Parametric Imaging; 2.5.5.2 Compartment Modeling of Tomographic Data; 2.6 Summary; References; 3 X-Ray Imaging; 3.1 Basics; 3.1.1 History; 3.1.2 Basic Physics; 3.2 Instrumentation; 3.2.1 Components; 3.2.1.1 Beam Generation; 3.2.1.2 Reduction of Scattered Radiation; 3.2.1.3 Image Detection; 3.3 Clinical Applications; 3.3.1 Diagnostic Devices; 3.3.1.1 Projection Radiography
3.3.1.2 Mammography
3.3.1.3 Fluoroscopy; 3.3.1.4 Angiography;
3.3.1.5 Portable Devices; 3.3.2 High Voltage and Image Quality; 3.3.3 Tomography/Tomosynthesis; 3.3.4 Dual Energy Imaging; 3.3.5 Computer Applications; 3.3.6 Interventional Radiology; 3.4 Radiation Exposure to Patients and Employees; References; 4 Computed Tomography; 4.1 Basics; 4.1.1 History; 4.1.2 Basic Physics and Image Reconstruction; 4.2 Instrumentation; 4.2.1 Gantry; 4.2.2 X-ray Tube and Generator; 4.2.3 MDCT Detector Design and Slice Collimation; 4.2.4 Data Rates and Data Transmission; 4.2.5 Dual Source CT
4.3 Measurement Techniques
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4.4.2 Radiation Dose in Typical Clinical Applications and Methods for Dose Reduction

Sommario/riassunto

"This book presents and describes imaging technologies that can be used to study chemical processes and structural interactions in dynamic systems, principally in biomedical systems. The imaging technologies, largely biomedical imaging technologies such as MRT, Fluorescence mapping, raman mapping, nanoESCA, and CARS microscopy, have been selected according to their application range and to the chemical information content of their data. These technologies allow for the analysis and evaluation of delicate biological samples, which must not be disturbed during the process. Ultimately, this may mean fewer animal lab tests and clinical trials"--Provided by publisher.
