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Nota di contenuto	Part 1: Introduction -- A Road Map for Computational Surgery: Challenges and Opportunities -- Part 2: Computer Assisted Management of Disease and Surgery -- Plato's CAVE – A Multidimensional, Image Guided Radiation Therapy Cross Reality Platform with Advanced Surgical Planning, Simulation and Visualization Techniques using (native) DICOM Patient Image Studies -- Stereotactic Body Radiotherapy (SBRT) / Stereotactic Ablative Body Radiotherapy (SABR) for Lung Cancer -- Computer Aided Management in Scoliosis Surgery -- Computational Modeling of Breast Conserving Surgery(BCS) starting from MRI Imaging -- Part 3: Image Processing and Diagnostics -- A statistical framework for biomarker analysis and HR-MAS 2D metabolite identification -- Hardware and performance considerations for computational medicine -- Image Driven Intervention and Robotic -- Cardiovascular Imaging, Navigation and Intervention-Hybrid Imaging and Therapeutics -- Towards automatic computer-aided planning in arthroplasty surgery by innovative methods for processing the bone surface models -- Robotic Assisted Lobectomy for Lung Cancer -- Robot interaction control in medicine and surgery: original results and open problems -- Control issues and possible solutions in robotized flexible endoscopy -- Beating Heart Surgery: Comparison of Two Active Compensation Solutions for Minimally Invasive Coronary Artery Bypass Grafting -- Part 5: Modeling, Simulation and Experimental data -- 5.1

Cardiovascular -- Segmentation and Blood Flow Simulations of Patient-Specific Heart Data -- Assessment of Hemodynamics in DeBakey Type III Aortic Dissections For Planning Surgical Interventions and to Understand Post-Treatment Changes -- Three-Dimensional Numerical Simulation of Plaque Formation in Arteries -- Rule Base Simulation of Vein Graft Remodeling -- Transport in nanoconfinement and within blood vessel wall -- 5.2 Cancer -- Some models for the prediction of tumor growth: general framework and applications to metastases in the lung -- Quantifying the Role of Anisotropic Invasion in Human Glioblastoma -- A mathematical model for growing metastases on oncologists's service -- 5.3 Epilepsy -- 5.4 Bone -- Calculation of the Discrete Effective Stiffness of Cancellous Bone by Direct Mechanical Simulations -- Part 6: Training and Performance Analysis -- Robotics as a Tool for Training and Assessment of Surgical Skill -- Workload and Performance Analyses with Haptic and Visually-Guided Training in a Dynamic Motor Skill Task.

Sommario/riassunto

This critical volume focuses on the use of medical imaging, medical robotics, simulation, and information technology in surgery. It offers a road map for computational surgery success, discusses the computer-assisted management of disease and surgery, and provides a rational for image processing and diagnostic. This book also presents some advances on image-driven intervention and robotics, as well as evaluates models and simulations for a broad spectrum of cancers as well as cardiovascular, neurological, and bone diseases. Training and performance analysis in surgery assisted by robotic systems is also covered. This book also: · Provides a comprehensive overview of the use of computational surgery and disease management
· Discusses the design and use of medical robotic tools for orthopedic surgery, endoscopic surgery, and prostate surgery
· Provides practical examples and case studies in the areas of image processing, virtual surgery, and simulation training
Computational Surgery and Dual Training: Computing, Robotics and Imaging is an ideal book for graduate students and professionals in the area of bioengineering, computational science, computational medicine, and medical residents in surgery.