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Nota di contenuto	Part I: Invited Lectures -- Cutting in real-time in corrotational elasticity and perspectives on simulating cuts -- Why most of the intra-operative medical robotic devices do not use biomechanical models? Some clues to explain the bottlenecks and the needed research breakthroughs -- Part II: Computational Biomechanics of Soft Organs and Flow -- Numeric simulation of fluid structure interaction in the aortic arch -- Patient-specific computational models: Tools for improving the efficiency of Medical Compression Stockings -- Intraoperative damage monitoring of endoclamp balloon expansion using real-time finite element modeling -- 3D Algorithm for simulation of soft tissue cutting -- Simulation of congenital heart defect corrective surgeries using thin shell elements -- Efficient suturing of deformable models -- Part III: Computational Biomechanics for Image-Guided Surgery -- Objective evaluation of accuracy of intraoperative neuroimage registration -- Registration of brain tumor images using hyper-elastic regularization

-- Heterogeneous biomechanical model on correcting brain deformation induced by tumor resection -- Intra-operative update of neuro-images: Comparison of performance of image warping using patient-specific biomechanical model and BSpline image registration -- Part IV: Musculoskeletal System, Muscles and Injury Biomechanics -- Trabecular bone poroelasticity for microCT-based FE models -- Using multibody dynamics to design total knee replacement implants -- Using tagged MRI to quantify the 3D deformation of a cadaver brain in response to angular acceleration -- Identification of tongue muscle fibre group contraction from MR images -- Finite element analysis of thorax responses under quasi-static and dynamic loading.

Sommario/riassunto

One of the greatest challenges for mechanical engineers is to extend the success of computational mechanics to fields outside traditional engineering, in particular to biology, biomedical sciences, and medicine. This book is an opportunity for computational biomechanics specialists to present and exchange opinions on the opportunities of applying their techniques to computer-integrated medicine. Computational Biomechanics for Medicine: Models, Algorithms and Implementation collects the papers from the Seventh Computational Biomechanics for Medicine Workshop held in Nice in conjunction with the Medical Image Computing and Computer Assisted Intervention conference. The topics covered include: medical image analysis, image-guided surgery, surgical simulation, surgical intervention planning, disease prognosis and diagnostics, injury mechanism analysis, implant and prostheses design, and medical robotics.