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Nota di contenuto	Cardiac Imaging and Electrophysiology -- Characterization of Post-infarct Scars in a Porcine Model – A Combined Experimental and Theoretical Study -- Evolution of Intracellular Ca2?+? Waves from about 10,000 RyR Clusters: Towards Solving a Computationally Daunting Task -- Cardiac Motion Estimation from Intracardiac Electrical Mapping Data: Identifying a Septal Flash in Heart Failure -- Extracting Clinically Relevant Circular Mapping and Coronary Sinus Catheter Potentials from Atrial Simulations -- Cardiac Architecture Imaging and Analysis --

Cardiac Fibre Trace Clustering for the Interpretation of the Human Heart Architecture -- A Quantitative Comparison of the Myocardial Fibre Orientation in the Rabbit as Determined by Histology and by Diffusion Tensor-MRI -- Adaptive Reorientation of Cardiac Myofibers: Comparison of Left Ventricular Shear in Model and Experiment -- The Purkinje System and Cardiac Geometry: Assessing Their Influence on the Paced Heart -- Noise-Reduced TPS Interpolation of Primary Vector Fields for Fiber Tracking in Human Cardiac DT-MRI -- Comparison of Rule-Based and DTMRI-Derived Fibre Architecture in a Whole Rat Ventricular Computational Model -- Cardiac Imaging -- Fixing the Beating Heart: Ultrasound Guidance for Robotic Intracardiac Surgery -- Lumen Border Detection of Intravascular Ultrasound via Denoising of Directional Wavelet Representations -- A Statistical Approach for Detecting Tubular Structures in Myocardial Infarct Scars -- Quantitative Tool for the Assessment of Myocardial Perfusion during X-Ray Angiographic Procedures -- Multiview RT3D Echocardiography Image Fusion -- Cardiac Electrophysiology -- Investigating Arrhythmogenic Effects of the hERG Mutation N588K in Virtual Human Atria -- Left to Right Atrial Electrophysiological Differences: Substrate for a Dominant Reentrant Source during Atrial Fibrillation -- Electrocardiographic Simulation on Coupled Meshfree-BEM Platform -- HERG Effects on Ventricular Action Potential Duration and Tissue Vulnerability: A Computational Study -- Voxel Based Adaptive Meshless Method for Cardiac Electrophysiology Simulation -- Cardiac Motion Estimation -- Local Cardiac Wall Motion Estimation from Retrospectively Gated CT Images -- Physically-Constrained Diffeomorphic Demons for the Estimation of 3D Myocardium Strain from Cine-MRI -- Coronary Occlusion Detection with 4D Optical Flow Based Strain Estimation on 4D Ultrasound -- Cardiac Motion Extraction from Images by Filtering Estimation Based on a Biomechanical Model -- Active Model with Orthotropic Hyperelastic Material for Cardiac Image Analysis -- Cardiac Mechanics -- Personalised Electromechanical Model of the Heart for the Prediction of the Acute Effects of Cardiac Resynchronisation Therapy -- Ventricular Mechanical Asynchrony in Pulmonary Arterial Hypertension: A Model Study -- A Hybrid Tissue-Level Model of the Left Ventricle: Application to the Analysis of the Regional Cardiac Function in Heart Failure -- Cardiac Electrophysiology -- The Role of Blood Vessels in Rabbit Propagation Dynamics and Cardiac Arrhythmias -- Estimation of Atrial Multiple Reentrant Circuits from Surface ECG Signals Based on a Vectorcardiographic Approach -- Atrial Anatomy Influences Onset and Termination of Atrial Fibrillation: A Computer Model Study -- Cardiac Image Analysis -- Left Ventricle Segmentation from Contrast Enhanced Fast Rotating Ultrasound Images Using Three Dimensional Active Shape Models -- Free-Form Deformations Using Adaptive Control Point Status for Whole Heart MR Segmentation -- Integrating Viability Information into a Cardiac Model for Interventional Guidance -- 3D TEE Registration with X-Ray Fluoroscopy for Interventional Cardiac Applications -- Multi-sequence Registration of Cine, Tagged and Delay-Enhancement MRI with Shift Correction and Steerable Pyramid-Based Detagging -- Segmentation of Left Ventricle in Cardiac Cine MRI: An Automatic Image-Driven Method -- Cardiac Biophysical Simulation -- The Importance of Model Parameters and Boundary Conditions in Whole Organ Models of Cardiac Contraction -- Numerical Simulation of the Electromechanical Activity of the Heart -- A Global Sensitivity Index for Biophysically Detailed Cardiac Cell Models: A Computational Approach -- Cardiac Motion Recovery and Boundary Conditions Estimation by Coupling an Electromechanical Model and Cine-MRI Data -- Atrioventricular Blood Flow Simulation Based on Patient-Specific Data

-- Cardiac Research Platforms -- A Software Platform for Real-Time Visualization and Manipulation of 4D Cardiac Images -- euHeartDB: A Web-Enabled Database for Geometrical Models of the Heart -- GIMIAS: An Open Source Framework for Efficient Development of Research Tools and Clinical Prototypes -- Cardiac Image Analysis -- Maximum Likelihood Motion Estimation in 3D Echocardiography through Non-rigid Registration in Spherical Coordinates -- Large Diffeomorphic FFD Registration for Motion and Strain Quantification from 3D-US Sequences -- Random Forest Classification for Automatic Delineation of Myocardium in Real-Time 3D Echocardiography -- Discriminative Joint Context for Automatic Landmark Set Detection from a Single Cardiac MR Long Axis Slice -- Cardiac Anatomical and Functional Imaging -- Cardiac Imaging and Modeling for Guidance of Minimally Invasive Beating Heart Interventions -- Computer-Assisted Open Heart CABG: Image-Guided Navigation for All Target Vessels -- Extraction of Coronary Vascular Tree and Myocardial Perfusion Data from Stacks of Cryomicrotome Images -- Intravoxel Fibre Structure of the Left Ventricular Free Wall and Posterior Left-Right Ventricular Insertion Site in Canine Myocardium Using Q-Ball Imaging -- Cardiac Electrophysiology -- Relationship between Maximal Upstroke Velocity of Transmembrane Voltage and Minimum Time Derivative of Extracellular Potential -- Effects of Anisotropy and Transmural Heterogeneity on the T-Wave Polarity of Simulated Electrograms -- From Intracardiac Electrograms to Electrocardiograms: Models and Metamodels.

Sommario/riassunto

This book constitutes the refereed proceedings of the 5th International Conference on Functional Imaging and Modeling of the Heart, FIMH 2009, held in Nice, France in June 2009. The 54 revised full papers presented were carefully reviewed and selected from numerous submissions. The contributions cover topics such as cardiac imaging and electrophysiology, cardiac architecture imaging and analysis, cardiac imaging, cardiac electrophysiology, cardiac motion estimation, cardiac mechanics, cardiac image analysis, cardiac biophysical simulation, cardiac research platforms, and cardiac anatomical and functional imaging.