

Contents

Function

Learning a Global Descriptor of Cardiac Motion from a Large Cohort of 1000+ Normal Subjects	3
<i>Wenjia Bai, Devis Peressutti, Ozan Oktay, Wenzhe Shi, Declan P. O'Regan, Andrew P. King, and Daniel Rueckert</i>	
Steps Towards Quantification of the Cardiological Stress Exam	12
<i>R. Chabiniok, E. Sammut, M. Hadjicharalambous, L. Asner, D. Nordsletten, R. Razavi, and N. Smith</i>	
Personalization of Atrial Electrophysiology Models from Decapolar Catheter Measurements	21
<i>Cesare Corrado, Steven Williams, Henry Chubb, Mark O'Neill, and Steven A. Niederer</i>	
Automatic LV Feature Detection and Blood-Pool Tracking from Multi-plane TEE Time Series	29
<i>Shusil Dangi, Yehuda K. Ben-Zikri, Yechiel Lamash, Karl Q. Schwarz, and Cristian A. Linte</i>	
Assessment of Septal Motion Abnormalities in Left Bundle Branch Block Patients Using Computer Simulations	40
<i>Peter R. Huntjens, John Walmsley, Vincent Wu, Tammo Delhaas, Leon Axel, and Joost Lumens</i>	
Quantifying Structural and Functional Differences Between Normal and Fibrotic Ventricles.	48
<i>Prashanna Khwaounjoo, Ian J. LeGrice, Mark L. Trew, and Bruce H. Smaill</i>	
Sparsity and Biomechanics Inspired Integration of Shape and Speckle Tracking for Cardiac Deformation Analysis	57
<i>Nripesh Parajuli, Colin B. Compas, Ben A. Lin, Smita Sampath, Matthew O'Donnell, Albert J. Sinusas, and James S. Duncan</i>	
Characterization of Myocardial Velocities by Multiple Kernel Learning: Application to Heart Failure with Preserved Ejection Fraction.	65
<i>Sergio Sanchez-Martinez, Nicolas Duchateau, Bart Bijmens, Tamás Erdei, Alan Fraser, and Gemma Piella</i>	

Quantitative Analysis of Lead Position vs. Correction of Electrical Dyssynchrony in an Experimental Model of LBBB/CRT	74
<i>David Soto-Iglesias, Nicolas Duchateau, Constantine Butakoff, David Andreu, Juan Fernández-Armenta, Bart Bijnens, Antonio Berruezo, Marta Sitges, and Oscar Camara</i>	
Principal Component Analysis for the Classification of Cardiac Motion Abnormalities Based on Echocardiographic Strain and Strain Rate Imaging	83
<i>Mahdi Tabassian, Martino Alessandrini, Luca De Marchi, Guido Masetti, Nicholas Cauwenberghs, Tatiana Kouznetsova, and Jan D'hooge</i>	
Prediction of Clinical Information from Cardiac MRI Using Manifold Learning	91
<i>Haiyan Wang, Wenzhe Shi, Wenjia Bai, Antonio M. Simoes Monteiro de Marvao, Timothy J.W. Dawes, Declan P. O'Regan, Philip Edwards, Stuart Cook, and Daniel Rueckert</i>	
Revealing Differences in Anatomical Remodelling of the Systemic Right Ventricle	99
<i>Ernesto Zacur, James Wong, Reza Razavi, Tal Geva, Gerald Greil, and Pablo Lamata</i>	
Imaging	
Assessment of Myofiber Orientation in High Resolution Phase-Contrast CT Images	111
<i>V. Balićević, S. Lončarić, R. Cárdenes, A. Gonzalez-Tendero, B. Paun, F. Crispi, C. Butakoff, and B. Bijnens</i>	
Sensitivity Analysis of Diffusion Tensor MRI in Simulated Rat Myocardium	120
<i>Joanne Bates, Irvin Teh, Peter Kohl, Jürgen E. Schneider, and Vicente Grau</i>	
3D Farnebäck Optic Flow for Extended Field of View of Echocardiography	129
<i>A. Danudibroto, O. Gerard, M. Alessandrini, O. Mirea, J. D'hooge, and E. Samset</i>	
Towards Automatic Assessment of the Mitral Valve Coaptation Zone from 4D Ultrasound	137
<i>Sandy Engelhardt, Nils Lichtenberg, Sameer Al-Maisary, Raffaele De Simone, Helmut Rauch, Jens Roggenbach, Stefan Müller, Matthias Karck, Hans-Peter Meinzer, and Ivo Wolf</i>	

Field-Based Parameterisation of Cardiac Muscle Structure from Diffusion Tensors	146
<i>Bianca Freytag, Vicky Y. Wang, G. Richard Christie, Alexander J. Wilson, Gregory B. Sands, Ian J. LeGrice, Alistair A. Young, and Martyn P. Nash</i>	
Left Atrial Segmentation from 3D Respiratory- and ECG-gated Magnetic Resonance Angiography.	155
<i>Rashed Karim, Henry Chubb, Wieland Staab, Shadman Aziz, R. James Housden, Mark O'Neill, Reza Razavi, and Kawal Rhode</i>	
A Comprehensive Framework for the Characterization of the Complete Mitral Valve Geometry for the Development of a Population-Averaged Model.	164
<i>Amir H. Khalighi, Andrew Drach, Fleur M. ter Huurne, Chung-Hao Lee, Charles Bloodworth, Eric L. Pierce, Morten O. Jensen, Ajit P. Yoganathan, and Michael S. Sacks</i>	
Very High-Resolution Imaging of Post-Mortem Human Cardiac Tissue Using X-Ray Phase Contrast Tomography	172
<i>I. Mirea, F. Varray, Y.M. Zhu, L. Fanton, M. Langer, P.S. Jouk, G. Michalowicz, Y. Usson, and I.E. Magnin</i>	
Viewpoint Recognition in Cardiac CT Images	180
<i>Mehdi Moradi, Noel C. Codella, and Tanveer Syeda-Mahmood</i>	
Data-Driven Feature Learning for Myocardial Segmentation of CP-BOLD MRI	189
<i>Anirban Mukhopadhyay, Ilkay Oksuz, Marco Bevilacqua, Rohan Dharmakumar, and Sotirios A. Tsaftaris</i>	
Cardiac Fibers Estimation from Arbitrarily Spaced Diffusion Weighted MRI	198
<i>Andreas Nagler, Cristóbal Bertoglio, Christian T. Stoeck, Sebastian Kozerke, and Wolfgang A. Wall</i>	
Cardiac Motion Estimation Using Ultrafast Ultrasound Imaging Tested in a Finite Element Model of Cardiac Mechanics	207
<i>Maartje M. Nillesen, Anne E.C.M. Saris, Hendrik H.G. Hansen, Stein Fekkes, Frebus J. van Slochteren, Peter H.M. Bovendeerd, and Chris L. De Korte</i>	
Quantification of Gaps in Ablation Lesions Around the Pulmonary Veins in Delayed Enhancement MRI	215
<i>Marta Nuñez García, Catalina Tobon-Gomez, Kawal Rhode, Bart Bijnens, Oscar Camara, and Constantine Butakoff</i>	

Probabilistic Edge Map (PEM) for 3D Ultrasound Image Registration and Multi-atlas Left Ventricle Segmentation	223
<i>Ozan Oktay, Alberto Gomez, Kevin Keraudren, Andreas Schuh, Wenjia Bai, Wenzhe Shi, Graeme Penney, and Daniel Rueckert</i>	
Fuzzy Segmentation of the Left Ventricle in Cardiac MRI Using Physiological Constraints	231
<i>Tasos Papastylianou, Christopher Kelly, Benjamin Villard, Erica Dall' Armellina, and Vicente Grau</i>	
Subject Independent Reference Frame for the Left Ventricular Detailed Cardiac Anatomy	240
<i>Bruno Paun, Bart Bijmens, and Constantine Butakoff</i>	
Application of Diffuse Optical Reflectance to Measure Myocardial Wall Thickness and Presence of Infarct Scar: A Monte Carlo Simulation Study . . .	248
<i>Yee Chia Tang and Martin J. Bishop</i>	
Automated Quantification of Myocardial Infarction Using a Hidden Markov Random Field Model and the EM Algorithm	256
<i>M. Viallon, Joel Spaltenstein, C. de Bourguignon, C. Vandroux, A. Ammor, W. Romero, O. Bernard, P. Croisille, and P. Clarysse</i>	
Cross-Frame Ultrasonic Color Doppler Flow Heart Image Unwrapping	265
<i>Artem Yatchenko and Andrey Krylov</i>	
Orthogonal Shape Modes Describing Clinical Indices of Remodeling	273
<i>Xingyu Zhang, Bharath Ambale-Venkatesh, David A. Bluemke, Brett R. Cowan, J. Paul Finn, William G. Hundley, Alan H. Kadish, Daniel C. Lee, Joao A.C. Lima, Avan Suinesiaputra, Alistair A. Young, and Pau Medrano-Gracia</i>	

Models of Mechanics

A Framework for Determination of Heart Valves' Mechanical Properties Using Inverse-Modeling Approach	285
<i>Ankush Aggarwal and Michael S. Sacks</i>	
Patient-Specific Biomechanical Modeling of Cardiac Amyloidosis – A Case Study	295
<i>D. Chapelle, A. Felder, R. Chabiniok, A. Guellich, J.-F. Deux, and T. Damy</i>	
Relationship Between Cardiac Electrical and Mechanical Activation Markers by Coupling Bidomain and Deformation Models	304
<i>Piero Colli-Franzone, Luca F. Pavarino, and Simone Scacchi</i>	

Influence of Polyvinylalcohol Cryogel Material Model in FEM Simulations on Deformation of LV Phantom	313
<i>Szymon Cygan, Jakub Żmigrodzki, Beata Leśniak-Plewińska, Maciej Karny, Zbigniew Pakieła, and Krzysztof Kałużyński</i>	
Image-Derived Human Left Ventricular Modelling with Fluid-Structure Interaction.	321
<i>Hao Gao, Colin Berry, and Xiaoyu Luo</i>	
Fluid-Structure Interaction Model of Human Mitral Valve within Left Ventricle	330
<i>Hao Gao, Nan Qi, Xingshuang Ma, Boyce E. Griffith, Colin Berry, and Xiaoyu Luo</i>	
Finite Element Simulations Explore a Novel Strategy for Surgical Repair of Congenital Aortic Valve Insufficiency	338
<i>Peter E. Hammer and Pedro J. del Nido</i>	
Determining Anisotropic Myocardial Stiffness from Magnetic Resonance Elastography: A Simulation Study.	346
<i>Renee Miller, Haodan Jiang, Ria Mazumder, Brett R. Cowan, Martyn P. Nash, Arunark Kolipaka, and Alistair A. Young</i>	
Myocardial Stiffness Estimation: A Novel Cost Function for Unique Parameter Identification	355
<i>Anastasia Nasopoulou, Bojan Blazevic, Andrew Crozier, Wenzhe Shi, Anoop Shetty, C. Aldo Rinaldi, Pablo Lamata, and Steven A. Niederer</i>	
Hemodynamics in Aortic Regurgitation Simulated Using a Computational Cardiovascular System Model.	364
<i>G. Palau-Caballero, J. Walmsley, P. Rudenick, A. Evangelista, J. Lumens, and T. Delhaas</i>	
How to Choose Myofiber Orientation in a Biventricular Finite Element Model?	373
<i>Marieke Pluijmer, Frits Prinzen, Adrián Flores de la Parra, Wilco Kroon, Tammo Delhaas, and Peter H.M. Bovendeerd</i>	
Microstructural Remodelling and Mechanics of Hypertensive Heart Disease	382
<i>Vicky Y. Wang, Alexander J. Wilson, Gregory B. Sands, Alistair A. Young, Ian J. LeGrice, and Martyn P. Nash</i>	

Models of Electrophysiology

Inverse Problem of Electrocardiography: Estimating the Location of Cardiac Ischemia in a 3D Realistic Geometry	393
<i>Carlos Eduardo Chávez, Nejib Zemzemi, Yves Coudière, Felipe Alonso-Atienza, and Diego Álvarez</i>	
Sequential State Estimation for Electrophysiology Models with Front Level-Set Data Using Topological Gradient Derivations	402
<i>A. Collin, D. Chapelle, and P. Moireau</i>	
The Role of Endocardial Trabeculations in Low-Energy Defibrillation	412
<i>Adam Connolly and Martin J. Bishop</i>	
Computational Modelling of Low Voltage Resonant Drift of Scroll Waves in the Realistic Human Atria	421
<i>Sanjay R. Kharche, Irina V. Biktasheva, Gunnar Seemann, Henggui Zhang, Jichao Zhao, and Vadim N. Biktashev</i>	
Efficient Numerical Schemes for Computing Cardiac Electrical Activation over Realistic Purkinje Networks: Method and Verification	430
<i>Matthias Lange, Simone Palamara, Toni Lassila, Christian Vergara, Alfio Quarteroni, and Alejandro F. Frangi</i>	
Left and Right Atrial Contribution to the P-Wave in Realistic Computational Models	439
<i>Axel Loewe, Martin W. Krueger, Pyotr G. Platonov, Fredrik Holmqvist, Olaf Dössel, and Gunnar Seemann</i>	
Propagation of Myocardial Fibre Architecture Uncertainty on Electromechanical Model Parameter Estimation: A Case Study	448
<i>Roch Molléro, Dominik Neumann, Marc-Michel Rohé, Manasi Datar, Hervé Lombaert, Nicholas Ayache, Dorin Comaniciu, Olivier Ecabert, Marcello Chinali, Gabriele Rinelli, Xavier Pennec, Maxime Sermesant, and Tommaso Mansi</i>	
Issues in Modeling Cardiac Optical Mapping Measurements	457
<i>Gwladys Ravon, Yves Coudière, Angelo Iollo, Oliver Bernus, and Richard D. Walton</i>	
Data-Driven Model Reduction for Fast, High Fidelity Atrial Electrophysiology Computations	466
<i>Huanhuan Yang, Tiziano Passerini, Tommaso Mansi, and Dorin Comaniciu</i>	
Sensitivity of the Electrocardiography Inverse Solution to the Torso Conductivity Uncertainties	475
<i>N. Zemzemi, R. Aboulaich, N. Fikal, and E. El Guarmah</i>	
Author Index	485

Functional Imaging and Modeling of the Heart
8th International Conference, FIMH 2015, Maastricht,
The Netherlands, June 25-27, 2015. Proceedings
van Assen, H.; Bovendeerd, P.; Delhaas, T. (Eds.)
2015, XIV, 487 p. 210 illus., Softcover
ISBN: 978-3-319-20308-9