

Table of Contents

EP Simulation Challenge

EP Challenge - STACOM'11: Forward Approaches to Computational Electrophysiology Using MRI-Based Models and In-Vivo CARTO Mapping in Swine Hearts	1
<i>Mihaela Pop, Maxime Sermesant, Tommaso Mansi, Eugene Crystal, Sudip Ghatge, Jatin Relan, Charles Pierre, Yves Coudiere, Jennifer Barry, Ilan Lashevsky, Beiping Qiang, Elliot R. McVeigh, Nicholas Ayache, and Graham A. Wright</i>	
Personalisation of a 3D Ventricular Electrophysiological Model, Using Endocardial and Epicardial Contact Mapping and MRI	14
<i>Jatin Relan, Maxime Sermesant, Hervé Delingette, and Nicholas Ayache</i>	
Transmural Electrophysiologic and Scar Imaging on Porcine Heart with Chronic Infarction	23
<i>Linwei Wang, Fady Dawoud, Ken C.L. Wong, Heye Zhang, Huafeng Liu, Albert C. Lardo, and Pengcheng Shi</i>	

Motion Tracking Challenge

A Multimodal Database for the 1 st Cardiac Motion Analysis Challenge	33
<i>Catalina Tobon-Gomez, Mathieu De Craene, Annette Dahl, Stam Kapetanakis, Gerry Carr-White, Anja Lutz, Volker Rasche, Patrick Etyngier, Sebastian Kozerke, Tobias Schaeffter, Chiara Riccobene, Yves Martelli, Oscar Camara, Alejandro F. Frangi, and Kawal S. Rhode</i>	
Automatic Cardiac Motion Tracking Using Both Untagged and 3D Tagged MR Images	45
<i>Haiyan Wang, Wenzhe Shi, Xiaohai Zhuang, Simon Duckett, KaiPin Tung, Philip Edwards, Reza Razavi, Sebastien Ourselin, and Daniel Rueckert</i>	
An Incompressible Log-Domain Demons Algorithm for Tracking Heart Tissue	55
<i>Kristin McLeod, Adityo Prakosa, Tommaso Mansi, Maxime Sermesant, and Xavier Pennec</i>	

Temporal Diffeomorphic Free Form Deformation (TDFFD) Applied to
Motion and Deformation Quantification of Tagged MRI Sequences 68
*Mathieu De Craene, Catalina Tobon-Gomez, Constantine Butakoff,
Nicolas Duchateau, Gemma Piella, Kawal S. Rhode, and
Alejandro F. Frangi*

Motion Analysis with Quadrature Filter Based Registration of Tagged
MRI Sequences 78
Lennart Tautz, Anja Hennemuth, and Heinz-Otto Peitgen

Segmentation Challenge

Left Ventricular Segmentation Challenge from Cardiac MRI:
A Collation Study 88
*Avan Suinesiaputra, Brett R. Cowan, J. Paul Finn,
Carissa G. Fonseca, Alan H. Kadish, Daniel C. Lee,
Pau Medrano-Gracia, Simon K. Warfield, Wenchao Tao, and
Alistair A. Young*

Automatic Segmentation of the Myocardium in Cine MR Images Using
Deformable Registration 98
*Marie-Pierre Jolly, Christoph Guetter, Xiaoguang Lu, Hui Xue, and
Jens Guehring*

Layered Spatio-temporal Forests for Left Ventricle Segmentation from
4D Cardiac MRI Data 109
*Ján Margeta, Ezequiel Geremia, Antonio Criminisi, and
Nicholas Ayache*

Myocardial Segmentation Using Contour-Constrained Optical Flow
Tracking 120
Ahmed S. Fahmy, Ahmed O. Al-Agamy, and Ayman Khalifa

Regular Papers

Optimization for Multi-Region Segmentation of Cardiac MRI 129
Johannes Ulén, Petter Strandmark, and Fredrik Kahl

Analysis of Catheter-Based Registration with Vessel-Radius Weighting
of 3D CT Data to 2D X-ray for Cardiac Catheterisation Procedures in
a Phantom Study 139
*Michael Truong, Thomas Gordon, Reza Razavi,
Graeme Penney, and Kawal S. Rhode*

Myocardial Contractility and Regional Work throughout the Cardiac
Cycle Using FEM and MRI 149
*Vicky Y. Wang, Daniel B. Ennis, Brett R. Cowan,
Alistair A. Young, and Martyn P. Nash*

Variability of the Human Cardiac Laminar Structure	160
<i>Hervé Lombaert, Jean-Marc Peyrat, Laurent Fanton, Farida Cheriet, Hervé Delingette, Nicholas Ayache, Patrick Clarysse, Isabelle Magnin, and Pierre Croisille</i>	
Polynomial Regression Based Edge Filtering for Left Ventricle Tracking in 3D Echocardiography	168
<i>Engin Dikici and Fredrik Orderud</i>	
A Multi-image Graph Cut Approach for Cardiac Image Segmentation and Uncertainty Estimation	178
<i>Wenzhe Shi, Xiahai Zhuang, Robin Wolz, Duckett Simon, KaiPin Tung, Haiyan Wang, Sebastien Ourselin, Philip Edwards, Reza Razavi, and Daniel Rueckert</i>	
Toward Clinically-Feasible Noninvasive Electrophysiological Imaging: Investigating the Impact of Local Anatomical Details	188
<i>Azar Rahimi, Hongda Mao, Pengcheng Shi, and Linwei Wang</i>	
A 3D+Time Spatio-temporal Model for Joint Segmentation and Registration of Sparse Cardiac Cine MR Image Stacks	198
<i>An Elen, Jeroen Hermans, Hadewich Hermans, Frederik Maes, and Paul Suetens</i>	
Statistical Atlas of Human Cardiac Fibers: Comparison with Abnormal Hearts	207
<i>Hervé Lombaert, Jean-Marc Peyrat, Laurent Fanton, Farida Cheriet, Hervé Delingette, Nicholas Ayache, Patrick Clarysse, Isabelle Magnin, and Pierre Croisille</i>	
Maximum Likelihood Correction of Shape Bias Arising from Imaging Protocol: Application to Cardiac MRI	214
<i>Pau Medrano-Gracia, David A. Bluemke, Brett R. Cowan, J. Paul Finn, Carissa G. Fonseca, João A.C. Lima, Avan Suinesiaputra, and Alistair A. Young</i>	
Volumetric Modeling Electromechanics of the Heart	224
<i>Hongda Mao, Linwei Wang, Ken C.L. Wong, Huafeng Liu, and Pengcheng Shi</i>	
Matching Sparse Sets of Cardiac Image Cross-Sections Using Large Deformation Diffeomorphic Metric Mapping Algorithm	234
<i>Siamak Ardekani, Aastha Jain, Saurabh Jain, Theodore P. Abraham, Maria R. Abraham, Stefan Zimmerman, Raimond L. Winslow, Michael I. Miller, and Laurent Younes</i>	

VURTIGO: Visualization Platform for Real-Time, MRI-Guided
Cardiac Electroanatomic Mapping 244
 *Perry E. Radau, Stefan Pintilie, Roey Flor, Labonny Biswas,
 Samuel O. Oduneye, Venkat Ramanan, Kevan A. Anderson, and
 Graham A. Wright*

Validation of a Novel Method for the Automatic Segmentation of Left
Atrial Scar from Delayed-Enhancement Magnetic Resonance..... 254
 *Rashed Karim, Aruna Arujuna, Alex Brazier, Jaswinder Gill,
 C. Aldo Rinaldi, Michael Cooklin, Mark O'Neill, Reza Razavi,
 Tobias Schaeffter, Daniel Rueckert, and Kawal S. Rhode*

Cardiac Motion Estimation Using Covariant Derivatives and Helmholtz
Decomposition..... 263
 *Alessandro Becciu, Remco Duits, Bart J. Janssen,
 Luc M.J. Florack, and Hans C. van Assen*

Temporal Diffeomorphic Motion Analysis from Echocardiographic
Sequences by Using Intensity Transitivity Consistency 274
 Zhijun Zhang, David J. Sahn, and Xubo Song

Author Index 285