Sixth International Conference on
Functional Imaging and Modeling of the Heart
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Dimitris Metaxas (Rutgers, USA)

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Isabelle Magnin  University of Lyon  France
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May 25, 2011

08:00 - 09:00  Registration

09:00 - 09:30  Welcome Addresses
   Dimitris Metaxas, Leon Axel

09:30 - 10:15  Keynote Address
   Cardiac Imaging – Clinical Impact and Goals
   Eugene Grossi
   Professor Departments of Cardiothoracic Surgery (Fac) and VAMC
   Member of NYU Cardiothoracic Surgery Associates
   New York University Medical Center NYU

10:15 - 10:45  Coffee Break

10:45 - 12:05  Oral Session 1  Chairs: Sachse Frank, Dimitris Metaxas
   Cardiac Electrophysiology

   Anode make and break excitation mechanisms and strength-interval curves: bidomain simulations in 3D rotational anisotropy
   Piero Colli Franzone, Luca Pavarino, Simone Scacchi
   University of Pavia

   Comparing Simulated Electrocardiograms of Different Stages of Acute Cardiac Ischemia
   Mathias Wilhelms, Olaf Dössel, Gunnar Seemann
   Institute of Biomedical Engineering, Karlsruhe Institute of Technology

   Interpreting optical mapping recordings in the ischemic heart. A combined experimental and computational investigation.
   Sara Dutta, Martin Bishop, Pras Pathmanathan, Peter Lee, Peter Kohl, Alex Quinn, Blanca Rodriguez
   University of Oxford

   Towards high resolution computational models of the cardiac conduction system: a pipeline for characterization of Purkinje-ventricular-junctions
   Daniel Romero, Frank Sachse, Rafael Sebastian, Alejandro Frangi
   Universitat Pompeu Fabra

12:05 - 14:00  Lunch Break

14:00 - 15:00  Industrial Session  Chair: Ioannis Pavlidis
   Robert Manzke, Philips; Dorin Comaniciu, Siemens;
   Mark Davies, The Methodist Hospital; Leon Axel, NYUMC

15:00 - 16:20  Poster Session 1  Cardiac Electrophysiology

   Bi-partite Spectral Graph Co-clustering of Cellular Transmural Transmembrane Potential Dynamics
   Mohamed Elshrif, Linwei Wang, Pengcheng Shi
   Rochester Institute of Tech.

   Cardiac deformation from electro-anatomical mapping data: application to scar characterization
   Antonio Porras, Gemma Piella, Oscar Camara, Etel Silva, David Andreu, Antonio Berruezo,
   Alejandro Frangi
   Universitat Pompeu Fabra

   Comparing Image-Based Respiratory Motion Correction Methods for Anatomical Roadmap Guided Cardiac Electrophysiology Procedures
   Yingliang Ma, Kawal Rhode
   King's College London
Automatic Segmentation of Left Atrial Scar from Delayed-Enhancement Magnetic Resonance Imaging
*Rashed Karim, Aruna Arujuna, Alex Brazier, Jaswinder Gill, Aldo Rinald, Mark O'Neill, Tobias Schaeffter, Daniel Rueckert, Kawal Rhode*
King's College London

Estimation of Activation Times in Cardiac Tissue using Graph Based Methods
*Mikael Wallman, Nic Smith, Blanca Rodriguez*
Oxford University

Automatic Segmentation of Cardiac CTs - Personalized Atrial Models Augmented with Electrophysiological Structures
*Peter Neher, Hans Barschdorf, Sebastian Dries, Frank Weber, Martin Krueger, Olaf Doessel, Cristian Lorenz*
Philips Research

**Image Analysis**

Construction of Left Ventricle 3D Shape Atlas from Cardiac MRI
*Shaoting Zhang, Mustafa Uzunbas, Zhennan Yan, Mingchen Gao, Junzhou Huang, Dimitris Metaxas, Leon Axel*
Rutgers University

Simulation of Diffusion Anisotropy in DTI for Virtual Cardiac Fiber Structure
*Lihui Wang, Yuemin Zhu, Hongying Li, Wanyu Liu, Isabelle E. Magnin*
Harbin Institute of Technology, Creatis, University of Lyon

On the estimation of transmural myocardial shear by means of MRI tagging
*Alessandro Rossi, Theo Arts, Tammo Delhaas*
Maastricht University

Multi-frame Radial Basis Functions to Combine Shape and Speckle Tracking for Cardiac Deformation Analysis in Echocardiography
*Colin Compas, Ben Lin, Smita Sampath, Congxian Xia, Qifeng Wei, Albert Sinusas, James Duncan*
Yale University

**Functional Imaging and Modeling**

Monitoring treatment outcome: A visualization prototype for left ventricular transformation
*Stefan Wesarg*
TU Darmstadt

An Ultrasound-Driven Kinematic Model of the Heart that Enforces Local Incompressibility
*Dan Lin, Jeffrey Holmes, John Hossack*
University of Virginia

Driving dynamic cardiac model adaptation with MR-tagging displacement information
*Christopher Casta, Patrick Clarysse, Jerôme Pousin, Joël Schaerer, Pierre Croisille, Yue-Min Zhu*
Creatis, University of Lyon

Towards Patient Specific Catheter Selection: Computation of Aortic Geometry Based on Fused MRI Data
*Sami Rahman, Stefan Wesarg, Wolfram Voelker, Eugen Flehmann*
TU Darmstadt

**Oral Session 2**

**Image Analysis**

4D Cardiac Reconstruction Using High Resolution CT Images
*Mingchen Gao, Junzhou Huang, Shaoting Zhang, Zhen Qian, Szilard Voros, Dimitris Metaxas, Leon Axel*
Rutgers University

3D Fusion Transoesophageal Echocardiography Improves LV Assessment
Kashif Raipoot, Daniel Augustine, Christos Basagiannis, Alison Noble, Harald Becher, Paul Leeson
University of Oxford

Automatic segmentation from cardiac cine MRI with different pathologies using registration and multiple component EM estimation
Wenzhe Shi, Xiahai Zhuang, haiyan Wang, Dussett Simon, Declan Oregan, Eddie Edwards, Daniel Rueckert
Imperial College

Statistical Analysis of the Human Cardiac Fiber Architecture from DT-MRI
Herve Lombaert, Jean-Marc Peyrat, Pierre Croisille, Stanislas Rapacchi, Laurent Fontan, Patrick Clarysse, Herve Delinette, Nicholas Ayache
INRIA Sophia Antipolis

Morphological Classification: Application to cardiac MRI of Tetralogy of Fallot
Dong Hye Ye, Harold Litt, Christos Davatzikos, Pohl Kilian
University of Pennsylvania

18:30 - 20:30 Welcome Reception

May 26, 2011

09:00 - 09:45 Keynote Address
4D Cardiovascular Flow: The need, the pitfalls and the future
Ann Bolger
William Watt Kerr Professor of Clinical Medicine
Director of Echocardiography, San Francisco General Hospital
University of California San Francisco, School of Medicine

09:45 - 10:10 Coffee Break

10:10 - 12:10 Oral Session 3
Functional Imaging and Modeling

Cardiac MRI Intervention and Diagnosis via Deformable Collaborative Tracking
Yan Zhou, Nikolaos Tsekos, Erol Yeniars, Panagiotis Tsiamyrtzis, Ioannis Pavlidis
University of Houston

A 3D MRI-based computer model to study arrhythmia and its in-vivo experimental validation
Mihaela Pop, Maxime Sermesant, Jean-Marc Peyrat, Eugene Crystal, Sudip Ghat, Tommaso Mansi, Ilan Lashevsky, Beiping Qi, Elliot R McVeigh, Nicholas Ayache and Graham A Wright
Sunnybrook Research Institute

An Automated Segmentation and Classification Framework for CT-based Myocardial Perfusion Imaging For Detecting Myocardial Perfusion Defect
Zhen Qian, Parag Joshi, Sarah Rinehart, Szilard Voros
Fuqua Heart Center of Piedmont Heart Institute

Modeling Mitral Valve Leaflets from Three-Dimensional Ultrasound
Robert Schneider, William Burke, Gerald Marx, Pedro del Nido, Robert Howe
Harvard SEAS

Modeling Atrial Fiber Orientation in Patient-Specific Geometries: A Semi-Automatic Rule-Based Approach
Martin Krueger, Viktor Schmidt, Catalina Tobon, Frank Weber, Cristian Lorenz, David Keller, Hans Barschdorff, Michael Burdumy, Peter Neher, Gernot Plank, Kawal Rhode, Gunnar Seemann, Damien Sanchez-Quintana, Javier Saiz, Reza Razavi, Olaf Doessel

University of Pennsylvania
Inst Biomed Eng, KIT

Anisotropic Mass-Spring Method Accurately Simulates Mitral Valve Closure from Image-Based Models
Peter Hammer, Pedro del Nido, Robert Howe
Children’s Hospital Boston

12:10 - 14:00  Lunch Break

14:00 - 15:30  Poster Session 2

In Silico Analysis of the Impact of Transmural Myocardial Infarction on Cardiac Mechanical Dynamics for the 17 AHA Segments
Thomas Fritz
Karlsruhe Institute of Tech

Automatic Delineation of Left and Right Ventricles in Cardiac MRI Sequences Using a Joint Ventricular Model
Xiaoguang Lu, Yang Wang, Bogdan Georgescu, Arne Litman, Dorin Comaniciu
Siemens Corporate Research

Simulating drug-induced effects on the heart: from ion channel to body surface electrocardiogram
Nejib Zemzemi, Miguel Oscar Bernabeu, Javier Saiz, Blanca Rodriguez
University of Oxford

Slice-based Combination of Rest and Dobutamine-Stress Cardiac MRI in a Statistical Motion Model to Identify Myocardial Infarction: Validation against Contrast-Enhanced MRI
Avan Suinesiaputra, Alejandro Frangi, Hildo Lamb, Dirk Kaandorp, Jeroen Bax, Johan Reiber, Boudewijn Lelieveldt
Leiden University

Shape Analysis of Left Ventricular Endocardial Surface and Its Application in Detecting Coronary Artery Disease
Anirban Mukhopadhyay, Zhen Qian, Suchi Bhandarkar, Tianming Liu, szilard Voros
University of Georgia

Recovering Endocardial Walls from 3D TEE
P. Burlina, R. Mukherjee, R. Juang and C. Sprouse
JHU

Regionally optimised mathematical models of cardiac myocyte orientation
Ilya Emir Karadag, Martin Bishop, Patrick Hales, Jurgen Schneider, Peter Kohl, David Gavaghan, Vicente Grau
Oxford University ComLab

Mapping Contact Force during Catheter Ablation for the Treatment of Atrial Fibrillation: New Insights into Ablation Therapy
Rashed Karim, Gang Gao, James Harrison, Aruna, Arujuna, Hendrik Lambert, Giovanni Leo, Jaswinder Gill, Reza Razavi, Tobias Schaeffter, Mark O’Neill, Kawal Rhode
King’s College London

Trials on Tissue Contractility Estimation from Cardiac CineMRI Using a Biomechanical Heart Model
Radomir Chabiniok, Philippe Moireau, Jean-Francois Deux, Perre-Francois Lesault, Alain Rahmouni, Dominique Chapelle
INRIA Paris-Rocquencourt

Real-Time Cardiac MR Anatomy and Dyssynchrony Overlay for Guidance of Cardiac Resynchronization Therapy Procedures: Clinical Results Update
Yingliang Ma
King’s College London
Parameter identification and POD reduced order modeling for cardiac electrophysiology
Muriel Boulakia, Jean-Frederic Gerbeau
LJLL, UPMC (France)

Aruna Arujuna, Rashed Karim, Anoop Shetty, Aldo Rinald, Michael Cooklin, Mark O'Neill, Reza Razavi, Jasvinder Gill, Kawal Rhode
Kings College London

MagnetoHemoDynamics effect on Electrocardiograms
Vincent Martin, Agnes Drochon, Odette Fokapu, Jean-Frederic Gerbeau
INRIA Paris-Rocquencourt

A Hybrid Method for Automatic Anatomical Variant Detection and Segmentation
Raghed Hanna, Hans Barschdorf, Tobias Klinder, Frank Weber, Martin Krueger, Olaf Doessel, Cristian Lorenz
Philips Research

Patient-Specific Model of Left Heart Anatomy, Dynamics and Hemodynamics from 4D TEE: A First Validation Study
Ingmar Voigt, Tommaso Mansi, Viorel Mihalef, Razvan Ionasec, Anna Calleja, Etienne Assoumou Mengue, Puneet Sharma, Helene Houle, Bogdan Georgescu, Joachim Hornegger, Dorin Comaniciu
Siemens Corporate Research

15:30 - 17:10 Oral Session 4 Image Analysis

Cardiac Motion Estimation From 3D Echocardiography with Spatiotemporal Regularization
Zhijun Zhang, Xubo Song
Biomedical OHSU

Order statistic based cardiac boundary detection in 3D+t echocardiograms
Constantine Butakoff, Federico Sukno, Ada Doltra, Etel Silva, Marta Sitges, Alejandro Frangi
Universitat Pompeu Fabra

A Framework Combining Multi-Sequence MRI for Fully Automated Quantitative Analysis of Cardiac Global And Regional Functions
Xiahai Zhuang, Wenzhe Shi, S Duckett, Haiyan Wang, Reza Razavi, Daniel Rueckert, Sebastien Ourselin
University College London

Multiview Diffeomorphic Registration for Motion and Strain Estimation from 3D Ultrasound Sequences
Gemma Piella, Mathieu De Craene, Cheng Yao, Graeme Penney, Alejandro Frangi
University Pompeu Fabra

Pyramid Histograms of Motion Context with Application to Angiogram Video Classification
Fei Wang, Yong Zhang, David Beymer, Tanveer Syeda-Mahmood, Hayit Greenspan
IBM Almaden Research Center

17:15 - 18:00 Program Committee Meeting

19:00 - 22:00 Gala Dinner at 10th floor Rosenthal Pavilion, Kimmel Center
May 27, 2011

09:00 - 09:45  Keynote Address
Myocardial Deformation by MRI Tagging: From the Development Lab to Populations
Joao Lima
Professor of Medicine, Radiology and Epidemiology
Director of Cardiovascular Imaging
Johns Hopkins University

09:45 - 10:05  Coffee Break

10:05 - 11:45  Oral Session 5
Cardiac Mechanics, Cardiac Electrophysiology

An automatic data assimilation framework for patient-specific myocardial mechanical parameter estimation
Jiahua Xi, Pablo Lamata, Wenzhe Shi, Steven Niederer, Sander Land, Daniel Rueckert, Duckett Simon, Anoop Shetty, Aldo Rinald, Reza Razavi, Nic Smith
University of Oxford

Left-Ventricular Shape Determines Intramyocardial Stroke Work Distribution
Hon Fai Choi, Frank Rademakers, Piet Claus
Katholieke Universiteit Leuven

Constitutive Parameter Estimation Methodology Using Tagged-MRI Data
Alexandre Imperiale, Radomir Chabiniok, Philippe Moireau, Dominique Chapelle
INRIA Paris-Rocquencourt

Sensitivity Analysis of Mesh Warping and Subsampling Strategies for Generating Large Scale Electrophysiological Simulation Data
Corne Hoogendoorn, Ali Pashaei, Rafael Sebastian, Federico Sukno, Oscar Camara, Alejandro Frangi
Universitat Pompeu Fabra

Effect of scar development on fast electrophysiological models of the human heart: in-silico study on atlas-based virtual populations
Ali Pashaei, Corne Hoogendoorn, Rafael Sebastian, Daniel Romero, Oscar Camara, Alejandro Frangi
Universitat Pompeu Fabra

12:00 - 14:00  Lunch Break

14:00 - 17:00  Mini Symposium on Atrial Fibrillation and MRI
Rob MacLeod, Nassir F. Marrouche and Ravi Ranjan, University of Utah

Industrial Panel

17:00  Closing remarks
Conference Venue
Helen and Martin Kimmel Center, located at 60 Washington Square South.
Posters and exhibitors are in room 405 and 406 (4th floor)
Oral sessions are in Eisner & Lubin Auditorium (4th floor)