

Conference Program

Monday, September 15, 2014

8:00-8:30 **Opening Ceremony**

Polina Golland, Nobuhiko Hata, Christian Barrilot, Joachim Hornegger, Robert Howe

8:30-10:00 **Oral Session I - Microstructure Imaging and Image Reconstruction**

Papers of Oral Session I are open for discussion during Poster Session MA at 10am-12pm.
Chairs: Hayit Greenspan, Ghassan Hamarneh

Leveraging Random Forests for Interactive Exploration of Large Histological Images

Loic Peter, Diana Mateus, Pierre Chatelain, Noemi Schworm, Stefan Stangl, Gabriele Multhoff, Nassir Navab

Technische Universität München, Helmholtz Zentrum, Université de Rennes

Cell Detection and Segmentation Using Correlation Clustering

Chong Zhang, Julian Julian Yarkony, Fred Hamprecht

CellNetworks, Heidelberg University HCI/IWR

Candidate Sampling for Neuron Reconstruction from Anisotropic Electron Microscopy Volumes

Jan Funke, Julien Martel, Stephan Gerhard, Bjoern Andres, Dan Ciresan, Alessandro Giusti, Luca Gambardella, Juergen Schmidhuber, Hanspeter Pfister, Albert Cardona, Matthew Cook

Institute of Neuroinformatics UZH/ETHZ, HHMI Janelia Farm Research Campus, MPI Informatik, IDSIA (Dalle Molle Institute for Artificial Intelligence), Harvard University

A Fully Bayesian Inference Framework for Population Studies of the Brain Microstructure

Maxime Taquet, Benoit Scherrer, Jurriaan Peters, Sanjay Prabhu, Simon Warfield
Harvard Medical School, Boston Children's Hospital

Application-driven MRI: Joint Reconstruction and Segmentation from Undersampled MRI Data

Jose Caballero, Wenjia Bai, Anthony N Price, Daniel Rueckert, Joseph V Hajnal
Imperial College London, King's College London

Joint Parametric Reconstruction and Motion Correction Framework for Dynamic PET Data

Jieqing Jiao, Alexandre Bousse, Kris Thielemans, Pawel Markiewicz, Ninon Burgos, David Atkinson, Simon R. Arridge, Brian Hutton, Sebastien Ourselin
University College London

10:00 **Refreshments**

10:00-12:00 **Poster Session MA**

Microstructure Imaging, Image Reconstruction and Enhancement, Registration, Segmentation I

12:00-1:00 **Lunch, Educational Challenge Session**

1:00-3:00

Oral Session II - Computer Vision for Procedure Guidance

Papers of Oral Session II are open for discussion during Poster Session MP at 3-5pm.

Chairs: Mehdi Moradi, Danail Stoyanov

Auto Localization and Segmentation of Occluded Vessels in Robot-Assisted Partial Nephrectomy

Alborz Amir-Khalili, Jean-Marc Peyrat, Julien Abi-Nahed, Osama Al-Alao, Abdulla Al-Ansari, Ghassan Hamarneh, Rafeef Abugharbieh
University of British Columbia, Qatar Robotic Surgery Centre, Hamad General Hospital, Simon Fraser University

3D Global Estimation and Augmented Reality Visualization of Intra-operative X-ray Dose

Nicolas Loy Rodas, Nicolas Padoy
University of Strasbourg

An Augmented Reality Framework for Soft Tissue Surgery

Peter Mounthey, Johannes Fallert, Stephane Nicolau, Luc Soler, Philip Mewes
Siemens Corporate Research, IRCAD (Research Institute against Digestive Cancer), Imaging Technologies Research, Karl Storz, Siemens Healthcare-Germany

Pico Lantern: A Pick-up Projector for Augmented Reality in Laparoscopic Surgery

Philip Edgcumbe, Philip Pratt, Guang Zhong Yang, Chris Nguan, Robert Rohling
University of British Columbia, Hamlyn Centre for Robotic Surgery-Imperial College of Science

Efficient Stereo Image Geometrical Reconstruction at Arbitrary Camera Settings from a Single Calibration

Songbai Ji, Xiaoyao Fan, David Roberts, Keith Paulsen
Dartmouth College, Dartmouth Hitchcock Medical Center

A Compact Active Stereovision System with Dynamic Reconfiguration for Endoscopy or Colonoscopy Applications

Yingfan Hou, Erwan Dupont, Tanneguy Redarce, Frederic Lamarque
Université de Technologie de Compiègne, Institut National des Sciences Appliquées

Continuous Zoom Calibration by Tracking Salient Points in Endoscopic Video

Miguel Lourenco, Joao P. Barreto, Fernando Fonseca, Helder Ferreira, Rui M. Duarte, Jorge Correia-Pinto
University of Coimbra, University of Minho

Instrument Tracking via Online Learning in Retinal Microsurgery

Yeqing Li, Chen Chen, Xiaolei Huang, Junzhou Huang
University of Texas at Arlington, Lehigh University

3:00

Refreshments

3:00-5:00

Poster Session MP

Intervention Planning and Guidance I, Oncology, Optical Imaging, Segmentation II

5:00-7:00

Student Event: MICCAI Academia & Industry

Conference Program

Tuesday, September 16, 2014

8:00-9:00 **Oral Session III - Modeling**

Papers of Oral Session III are open for discussion during Poster Session TA at 10am-12pm.

Chairs: Dean Barratt, Xenophon Papademetris

Real-time Sensitivity Analysis of Blood Flow Simulations to Lumen Segmentation Uncertainty

Sethuraman Sankaran, Leo J Grady, Charles A Taylor
HeartFlow, Inc.

Robust Image-Based Estimation of Cardiac Tissue Parameters and their Uncertainty from Noisy Data

Dominik Neumann, Tommaso Mansi, Bogdan Georgescu, Ali Kamen, Elham Kayvanpour, Ali Amr, Farbod Sedaghat-Hamedani, Jan Haas, Hugo Katus, Benjamin Meder, Joachim Hornegger, Dorin Comaniciu
Friedrich-Alexander-Universität Erlangen-Nürnberg, Siemens Corporation, Heidelberg University Hospital

Advanced Transcatheter Aortic Valve Implantation (TAVI) Planning from CT with ShapeForest

Joshua K.Y. Swee, Sasa Grbic
Siemens Corporation

Tumor Growth Prediction with Hyperelastic Biomechanical Model, Physiological Data Fusion, and Nonlinear Optimization

Ken C. L. Wong, Ronald Summers, Electron Kebebew, Jianhua Yao
National Institutes of Health

9:00-10:00 **Keynote Lecture**

Physical Interaction: the Key to Therapeutic Robotics

Neville Hogan, MIT

10:00 **Refreshments**

10:00-12:00 **Poster Session TA**

Biophysical Modeling and Simulation, Temporal and Motion Analysis, Computer-Aided Diagnosis, Pediatric Imaging, Endoscopy, Ultrasound Imaging

12:00-1:00 **Lunch**

1:00-2:30

Oral Session IV- Machine Learning

Papers of Oral Session IV are open for discussion during Poster Session TP at 3-5pm.
Chairs: Marleen de Bruijne, Mert Sabuncu

Transport on Riemannian Manifold for Functional Connectivity-based Classification

Bernard Ng, Martin Dresler, Gael Varoquaux, Jean-Baptiste Poline, Michael Greicius, Bertrand Thirion

Stanford University, Donders Institute for Brain, Cognition and Behaviour, INRIA Saclay

Spatially Adaptive Registration using Gaussian Processes

Thomas Gerig, Kamal Shahim, Mauricio Reyes, Thomas Vetter, Marcel Luthi
University of Basel

Towards Automatic Bone Age Estimation from MRI: Localization of 3D Anatomical Landmarks

Thomas Ebner, Darko Stern, Rene Donner, Horst Bischof, Martin Urschler
Graz University of Technology, Ludwig Boltzmann Institute for Clinical Forensic Imaging, Medical University Vienna

Quantifying Progression of Multiple Sclerosis via Classification of Depth Videos

Peter Kotschieder, Jonas F. Dorn, Cecily Morrison, Robert Corish, Darko Zikic, Abigail Sellen, Marcus DSouza, Christian P. Kamm, Jessica Burggraaff, Prejaas Tewarie, Thomas Vogel, Michela Azzarito, Ben Glocker, Peter Chin, Frank Dahlke, Chris Polman, Ludwig Kappos, Bernard Uitdehaag, Antonio Criminisi
Microsoft Research, Novartis Pharma AG, University Hospital Basel, University Hospital Bern, VU University Medical Center, Amsterdam, Novartis Pharmaceuticals

Can Masses of Non-experts Train Highly Accurate Image Classifiers? A Crowdsourcing Approach to Instrument Segmentation in Laparoscopic Images

Lena Maier-Hein, Sven Mersmann, Daniel Kondermann, Sebastian Bodenstedt, Alexandro Sanchez, Christian Stock, Hannes Gotz Kenngott, Mathias Eisenmann, Stefanie Speidel

German Cancer Research Center (DKFZ), University of Heidelberg, Karlsruhe Institute of Technology (KIT)

Extracting Vascular Networks under Physiological Constraints via Integer Programming

Markus Rempfler, Matthias Schneider, Giovanna D Ielacqua, Xianghui Xiao, Stuart R Stock, Jan Klohs, Gabor Szekely, Bjoern Andres, Bjoern H Menze
ETH Zurich, Argonne National Laboratory, Northwestern University, MPI Informatik

2:30-3:00

Debate Session

Signal Processing or Machine Learning: What's Right for MICCAI?

3:00

Refreshments

3:00-5:00

Poster Session TP

Machine Learning I, Cardiovascular Imaging, Intervention Planning and Guidance II, Brain I

6:00-10:00

Jillian's

Conference Program

Wednesday, September 17, 2014

9:00-10:00 **Oral Session V - Shape**

Papers of Oral Session V are open for discussion during Poster Session WA at 10am-12pm.
Chairs: Miguel A. González Ballester, Marc Niethammer

Generalized Multiresolution Hierarchical Shape Models via Automatic Landmark Clusterization

Juan J. Cerrolaza, Arantxa Villanueva, Mauricio Reyes, Rafael Cabeza, Miguel Angel Gonzalez Ballester, Marius George Linguraru
Children's National Medical Center, Public University of Navarra, Institute for Surgical Technology and Biomechanics, Bern, ICREA

Hierarchical Bayesian Modeling, Estimation, and Sampling for Multigroup Shape Analysis

Yen-Yun Yu, P. Thomas Fletcher, Suyash P. Awate
SCI University of Utah, Indian Institute of Technology (IIT) Bombay

Depth-Based Shape-Analysis

Yi Hong, Yi Gao, Marc Niethammer, Sylvain Bouix
University of North Carolina at Chapel Hill, University of Alabama at Birmingham, Harvard Medical School

Genus-One Surface Registration via Teichmüller Extremal Mapping

Ka Chun Lam, Xianfeng Gu, Lok Ming Lui - The Chinese University of Hong Kong, Stony Brook University

10:00 **Refreshments**

10:00-12:00 **Poster Session WA**

Shape and Population Analysis, Brain II, Diffusion MRI, Machine Learning II

12:00-1:00 **Lunch, Session on MICCAI Review Process**

1:00-3:00

Oral Session VI - Brain and DTI

Papers of Oral Session VI are open for discussion during Poster Session WA at 10am-12pm.
Chairs: Li Shen, Koen Van Leemput

Co-occurrence of Local Anisotropic Gradient Orientations (CoLIAGe): Distinguishing tumor confounders and molecular subtypes on MRI

Prateek Prasanna, Pallavi Tiwari, Anant Madabhushi
Case Western Reserve University

Automatic Clustering and Thickness Measurement of Anatomical Variants of the Human Perirhinal Cortex

Long Xie, John Pluta, Hongzhi Wang, Sandhitsu R Das, Lauren Mancuso, Dasha Kloit, Brian B Avants, Songlin Ding, David A Wolk, Paul A Yushkevich
University of Pennsylvania, IBM Research, Allen Institute for Brain Science

Constructing 4D Infant Cortical Surface Atlases Based on Dynamic Developmental Trajectories of the Cortex

Gang Li, Li Wang, Feng Shi, Weili Lin, Dinggang Shen
University of North Carolina at Chapel Hill

Low-Rank to the Rescue -- Atlas-Based Analyses in the Presence of Pathologies

Xiaoxiao Liu, Marc Niethammer, Roland Kwitt, Matthew McCormick, Stephen Aylward
Kitware Inc, University of North Carolina at Chapel Hill, University of Salzburg

Optimized PatchMatch for Near Real Time and Accurate Label Fusion

Vinh-Thong Ta, Remi Giraud, D. Louis Collins, Pierrick Coupe
University of Bordeaux, LaBRI, McGill University

Functionally Driven Brain Networks Using Multi-Layer Graph Clustering

Yasser Ghanbari, Luke Bloy, Varsha Shankar, James Christopher Edgar, Timothy P.L Roberts, Robert T. Schultz, Ragini Verma
University of Pennsylvania, Lurie Family Foundations' MEG Imaging Center, Center for Autism Research, Children's Hospital of Philadelphia, University of Pennsylvania

MesoFT: Unifying Diffusion Modelling and Fiber Tracking

Marco Reisert, Valerij G Kiselev, Bibek Dhital, Elias Kellner, Dmitry S Novikov
University Medical Center, Freiburg, New York University School of Medicine

Measurement Tensors in Diffusion MRI: Generalizing the Concept of Diffusion Encoding

Carl-Fredrik Westin, Filip Szczepankiewicz, Ofer Pasternak, Evren Ozarslan, Daniel Topgaard, Hans Knutsson, Markus Nilsson
Harvard Medical School, Lund University, Linköping University

3:00

Refreshments

3:30-5:00

MICCAI Awards and Closing Ceremony