2009 IEEE International Symposium on Biomedical Imaging: From Nano to Macro

June 28 – July 1, 2009

Boston Park Plaza Hotel

Boston
Massachusetts
U.S.A.

Program Guide

ISBI 2009 is sponsored by

Conference at a Glance

Sunday, June 28

12:00 – 18:00	Registration Open
13:30 – 18:00	Tutorials

Monday, June 29

07:00 – 18:00	Registration Open
08:00 – 09:15	Poster Session
09:30 – 10:30	Plenary: Tom Miller
10:45 – 12:05	Parallel Oral Sessions
12:05 – 13:30	Lunch Break
13:30 – 14:50	Parallel Oral Sessions
15:00 – 16:20	Parallel Oral Sessions
16:40 – 18:00	Parallel Oral Sessions
18:15 – 20:15	Workshop on Challenges in Clinical Imaging

Tuesday, June 30

07:30 – 18:00	Registration Open
08:00 – 09:15	Poster Session
09:30 – 10:30	Plenary: Ralph Weissleder
10:45 – 12:05	Parallel Oral Sessions
12:05 – 13:30	Lunch Break
13:30 – 14:50	Parallel Oral Sessions
15:00 – 16:20	Parallel Oral Sessions
16:40 – 18:00	Parallel Oral Sessions
19:00 – 21:00	Reception at the Prudential Skywalk

Wednesday, July 1

07:30 – 18:00	Registration Open
08:00 – 09:15	Poster Session
09:30 – 10:30	Plenary: Xiaowei Zhuang
10:45 – 12:05	Parallel Oral Sessions
12:05 – 13:30	Lunch Break
13:30 – 14:50	Parallel Oral Sessions
15:00 – 16:20	Parallel Oral Sessions
16:40 – 18:00	Parallel Oral Sessions

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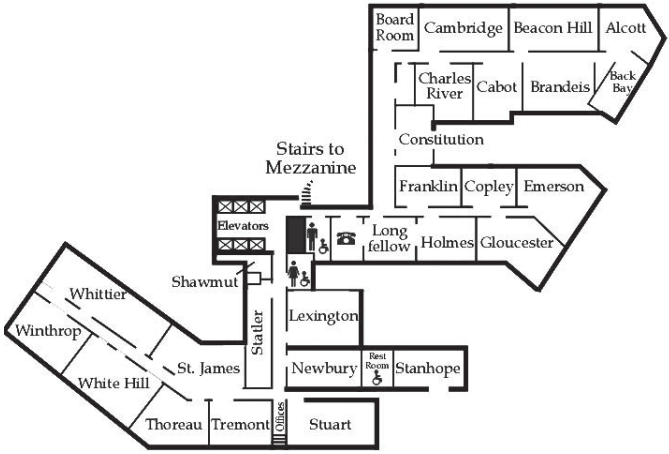
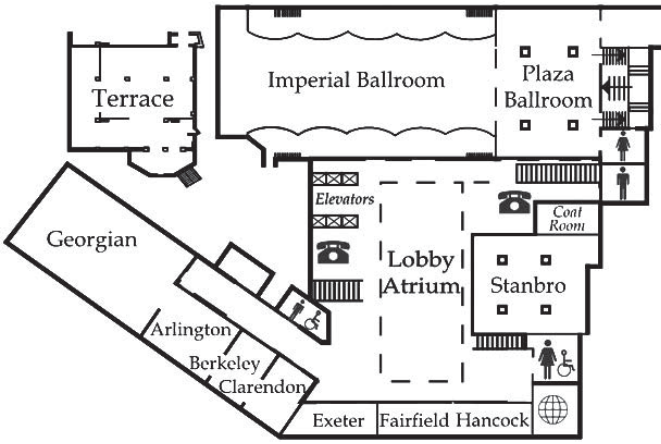
Meeting Room Maps

Fourth Floor (Meeting Rooms Level)



Mezzanine Level



Welcome

It is a great pleasure to welcome you to the 2009 IEEE International Symposium on Biomedical Imaging. Held in Boston, this sixth edition of ISBI is its first U.S. presentation outside of the metro Washington, D.C. area. Boston is one of oldest cities in the United States. It is the home of the country's first public school, first college, and first subway system. Boston is one of North America's most livable cities and we hope you enjoy its joie de vivre during your stay.

Since its inception in 2002, ISBI has become the premier platform fostering interaction between researchers in the multidisciplinary fields of medical and biological imaging. ISBI'09 begins on Sunday June 28, with tutorials by leading experts on key topics in biomedical imaging. The meeting formally opens the following day and consists of three days of plenary talks, invited special sessions, and contributed oral and poster sessions.

We are especially pleased that Thomas Miller, Ralph Weissleder, and Xiaowei Zhuang, three prominent leaders in biomedical imaging, will be giving plenary talks on exciting, cutting edge topics. In addition, Monday evening includes a special workshop by leading clinicians Drs. Thomas Brady, Gregory Sorensen, and Dan Kopans, on "Current and Future Challenges in Medical Imaging". The diverse nature of research in biomedical imaging is clearly reflected in the program, including presentations on the physical, mathematical, and computational aspects of image formation, processing, analysis, and visualization, in a great variety of molecular, cellular, anatomical and functional imaging applications. The social events of the meeting will feature a reception at the Prudential Tower Skywalk on Tuesday evening.

We would like to take this opportunity to thank all those involved in the planning and organization of the meeting. Homer Pien organized the set of invited special sessions, was indispensable in helping arrange the plenaries, and also served as the industrial liaison. Ross Whitaker arranged the tutorials that open the meeting. Scott Acton served as the financial chair. Christos Davatzikos coordinated publicity and Stanley Reeves handled publications. Eric Miller oversaw local arrangements and coordinated our student volunteers. Alejandro Frangi was our international

Welcome (cont.)

liaison and Yantian Zhang served as our NIH liaison. We gratefully acknowledge the time and effort donated by the reviewers in insuring a high level of quality in selecting papers for inclusion in the program. Many thanks also to the staff of Conference Management Services, Inc. (CMS), in particular Billene Mercer, Lance Cotton, and Bryan Stewart for their hands-on assistance in countless logistic matters, including online paper submission and reviewing, registration, preparation of the proceedings, and on-site organization. We also thank all the student helpers you see assisting you throughout the meeting. We thank Mercy Kowalczyk, Executive Director of the IEEE Signal Processing Society, and Laura Wolf, Executive Director of the IEEE Engineering in Medicine and Biology Society, for their support and advice. Finally, we thank the NIH, the NSF, and our corporate sponsors The MathWorks and Mercury Computer Systems for their generous support of the meeting.

This year, 527 contributed papers were submitted for review. Each paper was sent to at least three reviewers, who rated the papers and provided comments to the authors for improvement. Of these submissions, 338 were accepted for presentation with 168 contributed papers for oral presentation and 169 for poster presentation. In addition to contributed papers, 24 invited papers are presented in six special sessions. We thank all authors for choosing to submit their work to ISBI. All papers presented at the meeting are included in the CD-ROM proceedings and will be available online through the IEEE Xplore database.

We all look forward to the 2010 edition of ISBI, which will be held in Rotterdam, The Netherlands and chaired by Wiro Niessen.

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Monday, June 29, 09:30 – 10:30 **Imperial Ballroom**

Potential and Possibilities: From the Very Critical to the Very Difficult

Tom Miller, *Chief Executive Officer, Workflow and Solutions Division, Siemens Healthcare*

Abstract
Tom Miller, a noted and passionate advocate of medical imaging technology will present an intriguing view of the possibilities of medical technology in predicting, diagnosing, characterizing and treating disease. Miller will discuss the innovations of the past and the move forward as medicine and technology converge to develop the most effective standards of care and innovate new approaches to the most difficult of diseases, while realizing the potential of personalized medicine.

Speaker Biography
Thomas (Tom) J. Miller, Jr. is Chief Executive Officer (CEO) of Siemens Healthcare's Workflow and Solutions division. Previously, Tom was a member of the Group Board of Siemens Medical Solutions and has an impressive record of leadership within Siemens and other multi-national companies. He led Siemens Healthcare Information Technology business, the magnetic resonance division and the US sales and service organization. His broad range of expertise also includes leadership roles at Carl Zeiss, Inc. and Analogic Corporation. Additionally, his entrepreneurship includes co-founding LightLab Imaging, which commercialized a new diagnostic imaging method, optical coherence tomography (OCT), enabling the acquisition and display of real-time ultra high-resolution cross sectional images with light.

This broad range of experience and expertise in medical physics and information technology have served to shape Tom's passion for medicine and for transforming how we approach the prediction, prevention, diagnosis, and treatment of disease.

Tom holds a B.S. in Nuclear Engineering with a minor in English Literature from the University of Massachusetts and a Masters of Science degree from the Harvard Medical School/Massachusetts Institute of Technology (MIT) joint program in Medical Physics.

Tuesday, June 30, 09:30 – 10:30 **Imperial Ballroom**

Advances in Molecular Imaging

Ralph Weissleder, *Director, Center for Molecular Imaging Research; Director, Center for Systems Biology; Massachusetts General Hospital and Harvard Medical School*

Speaker Biography
Dr. Ralph Weissleder is a Professor at Harvard Medical School, Director of the Center for Systems Biology at Massachusetts General Hospital (MGH), Director of the Center for Molecular Imaging Research, and Attending Clinician (Interventional Radiology) at MGH. Dr. Weissleder is also a member of the Dana Farber Harvard Cancer Center (Prostate Cancer Program, the GI-cancer Program, the Neurooncology Program and the Program in Cancer Imaging). He is also an Associate Member of the Broad Institute (Chemical Biology Program) and a member of the Harvard Stem Cell Institute (HSCI) leading its Imaging Program. Dr. Weissleder's research interests include the development of novel molecular imaging techniques, tools for detection of early disease detection, development of nanomaterials for sensing and systems analysis. His research has been translational and several of his developments have led to advanced clinical trials with anticipated major impacts when these methods become routinely available. Dr. Weissleder is currently the principal investigator of several RO1 NIH grants, a P50 Center grant, a U24 grant, and a UO1 consortium focusing on nanotechnology. He has published over 400 original publications in peer reviewed journals in addition over 80 review articles, has authored and co-authored several textbooks and holds 15 patents. He is a founding member of the Society for Molecular Imaging Research and has served as its President in 2002. His work has been honored with numerous awards including the J. Taylor International Prize in Medicine, the Millenium Pharmaceuticals Innovator Award, the AUR Memorial Award, the ARRS President's Award, The Society for Molecular Imaging Lifetime Achievement Award, the Academy of Molecular Imaging 2006 Distinguished Basic Scientist Award and the 2008 RSNA Outstanding Researcher Award.

Wednesday, July 1, 09:30 – 10:30 **Imperial Ballroom**

Nanoscopic Imaging of Biomolecules, Cells and Tissues

Xiaowei Zhuang, *Professor of Chemistry and Chemical Biology; Professor of Physics; Harvard University*

Speaker Biography

Xiaowei Zhuang is a professor of Chemistry and Chemical Biology and professor of Physics at Harvard University, and an investigator of Howard Hughes Medical Institute Investigator. Zhuang is a leading expert in single-molecule biology and bioimaging. Her lab develops and applies advanced optical imaging techniques to study the behavior of individual biological molecules and complexes in vitro and in live cells. Her current research is focused on three major directions: (1) Developing super-resolution optical microscopy and applying this technology to cell biology and neurobiology, (2) Studying how biomolecules function, especially how proteins and nucleic acids interact, using single-molecule imaging; (3) Developing live-cell imaging techniques and investigating virus-cell interactions using live-cell imaging. Zhuang received her B.S. degree in Physics from the University of Science and Technology of China, and her Ph.D. Degrees in Physics from University of California at Berkeley. In 2001, she joined the faculty of Harvard University as an assistant professor. She was promoted to associate professor in 2005 and full professor in 2006. Zhuang received numerous awards, including the MacArthur Fellowship, Sloan Fellowship, Packard Fellowship for Science and Engineering, Beckman Young Investigator Award, Searle Scholar award, NSF CAREER award, ONR Young investigator award, TR Worlds Top 100 Young Innovators Award, Camille Dreyfus Teacher-Scholar Award, Coblentz Award, ACS Pure Chemistry Award, etc.

Tutorials

All tutorials will be held Sunday, June 28, 13:30 - 18:00.

T-1: Biomedical Ultrasound

Robin Cleveland, Boston University
Location: Beacon Hill Room

T-2: High Performance Medical Image Computing

Daniel Blezek, Biomedical Engineering, Mayo Clinic; Hans Peter Pfister, Harvard University; Eric Borisch, Mayo Clinic
Location: Whittier Room

T-3: Electron Microscopy Tomography

Albert Lawrence, James Bouwer, University of California, San Diego
Location: Cambridge Room

T-4: Statistical Shape Analysis: Theory, Software, and Applications

Tom Fletcher, University of Utah; Ivo Dinov, University of California, Los Angeles; Polina Golland, Massachusetts Institute of Technology; Shantanu Joshi, Jon Morra, Yonggang Shi, Vishal Patel, University of California, Los Angeles
Location: White Hill Room

Special Focus Workshop

Current and Future Challenges in Clinical Imaging

Monday, June 29, 18:15 – 20:15 **Georgian Room**

This workshop will feature three world-renowned clinicians from Massachusetts General Hospital and Harvard Medical School who will discuss biomedical imaging challenges confronting clinical research and patient care:

- Cardiac imaging, Thomas J. Brady, MD
- Brain imaging, Ellen Grant, MD
- Breast imaging, Dan Kopans, MD

Sunset at the Skywalk Reception - Prudential Tower Skywalk

Tuesday, June 30, 19:00 – 21:00

The 2009 ISBI Reception will take place at the Prudential Skywalk – one of the most dramatic venues in New England. The Skywalk is atop the 52-story Prudential Tower right in the middle of Boston. The observatory gives visitors a birds-eye view, making it the perfect vantage point to view the bustling city below. With 360 degrees of floor-to-ceiling windows, the Skywalk affords spectacular sights of the entire Boston area, and, on a clear summer day, the mountains of New Hampshire and even Cape Cod.

The Prudential Center comprises the Pru Tower, which is the second tallest building in Boston, along with the City Under Glass Mall, which includes several restaurants and numerous shops. The Prudential Center is about 1/2 a mile from the ISBI conference hotel and buses will be provided for those who do not wish to walk.

Registration Hours

The registration desk and ISBI office will be located on the Mezzanine Level of the Boston Park Plaza hotel.

Sunday, June 28 ..... 12:00 – 18:00
Monday, June 29 ..... 07:00 – 18:00
Tuesday, June 30 ..... 07:30 – 18:00
Wednesday, July 1 ..... 07:30 – 18:00

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MO1.R3: Super-resolution processing in medical imaging

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Chair: Denis Kouame, Universite de Toulouse, France
Monday, June 29, 10:45 - 12:05 **Berkeley/Clarendon**

MO3.R3: Large-scale physiological modeling and simulation initiatives

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Chairs: Alejandro Frangi, Pompeau Fabra University, Spain; Marco Viceconti, Instituti Ortopedici Rizzoli, Italy; Peter Hunter, University Auckland, New Zealand
Monday, June 29, 15:00 - 16:20 **Berkeley/Clarendon**

TO1.R4: Technological advances in ultrasound contrast agents

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Chairs: Robin Cleveland, Boston University, USA; Tyrone Porter, Boston University, USA
Tuesday, June 30, 10:45 - 12:05 **Stanbro**

TO3.R1: Statistical methods in neuroimage analysis

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Chairs: Larry Staib, Yale University, USA; Michelle Wang, University of Illinois, USA
Tuesday, June 30, 15:00 - 16:20 **Georgian**

WO1.R3: Emerging photonic imaging techniques

see pg. 82

Chair: Vasilis Ntziachristos, Technical University of Munich, Germany
Wednesday, July 1, 10:45 - 12:05 **Berkeley/Clarendon**

WO3.R1: Biomedical computing on many cores

see pg. 88

Chair: David Kaeli, Northeastern University
Wednesday, July 1, 15:00 - 16:20 **Georgian**

MP.PA **Segmentation P1** (Poster)
Time: Monday, June 29, 08:00 - 09:15
Place: Plaza Ballroom Area A
Chair: Mujdat Cetin, Sabanci University

MP.PA.1 **EVALUATION OF LEVEL SET-BASED HISTOLOGY IMAGE SEGMENTATION USING GEOMETRIC REGION CRITERIA**
Kannappan Palaniappan, Filiz Bunyak, University of Missouri, United States; Adel Hafiane, ENSI-Bourges, France

MP.PA.2 **ATLAS-BASED DEFORMABLE MUTUAL POPULATION SEGMENTATION**
Aristeidis Sotiras, Ecole Centrale Paris / INRIA Saclay, France; Nikos Komodakis, University of Crete, France; Georg Langs, Medical University of Vienna, France; Nikos Paragios, Ecole Centrale Paris /INRIA Saclay, France

MP.PA.3 **A DELAUNAY TRIANGULATION APPROACH FOR SEGMENTING CLUMPS OF NUCLEI**
Quan Wen, Hang Chang, Bahram Parvin, Lawrence Berkeley National Laboratory, United States

MP.PA.4 **A NEW UNCONSTRAINED IRIS IMAGE ANALYSIS AND SEGMENTATION METHOD IN BIOMETRICS**
Yu Chen, Malek Adjouadi, Changan Han, Armando Barreto, Florida International University, United States

MP.PA.5 **ROBUST SEGMENTATION OF BRAIN STRUCTURES IN MRI**
Maria Murgasova, David Edwards, Joseph V. Hajnal, Daniel Rueckert, Imperial College London, United Kingdom

MP.PA.6 **ATLAS-BASED REGISTRATION PARAMETERS IN SEGMENTING SUB-CORTICAL REGIONS FROM BRAIN MRI-IMAGES**
Jyrki Lötjönen, Juha Koikkalainen, VTT Technical Research Centre of Finland, Finland; Lennart Thurfjell, GE Healthcare, Sweden; Daniel Rueckert, Imperial College London, United Kingdom

MP.PA.7 **IMPROVED SEMI-AUTOMATED SEGMENTATION OF CARDIAC CT AND MR IMAGES**
Chao Li, Xiao Jia, Ying Sun, National University of Singapore, Singapore

MP.PA.8 **VOLUMETRIC SEGMENTATION OF MULTIPLE BASAL GANGLIA STRUCTURES USING NONPARAMETRIC COUPLED SHAPE AND INTER-SHAPE POSE PRIORS**
Mustafa Gokhan Uzunbas, Octavian Soldea, Mujdat Cetin, Gozde Unal, Aytul Ercil, Sabanci University, Turkey; Devrim Unay, Ahmet Ekin, Philips Research Europe, Netherlands; Zeynep Firat, Yeditepe University Hospital, Turkey

MP.PA.9 **HYBRID DEFORMABLE MODEL FOR ANEURYSM SEGMENTATION**
Stefanie Demirci, Guy Lejeune, Nassir Navab, Technische Universität München, Germany

MP.PA.10 **INTERACTIVE POLYGONS IN REGION-BASED DEFORMABLE CONTOURS FOR MEDICAL IMAGES**
Yaoyao Zhu, Tian Shen, Daniel Lopresti, Xiaolei Huang, Lehigh University, United States

MP.PA.11 **A NEW INTERACTIVE METHOD FOR CORONARY ARTERIES SEGMENTATION BASED ON TUBULAR ANISOTROPY**
Fethallah Benmansour, Laurent D. Cohen, CEREMADE, Univ Paris Dauphine, France

MP.PA.12 **FAST MEDICAL IMAGE SEGMENTATION THROUGH AN APPROXIMATION OF NARROW-BAND B-SPLINE LEVEL-SET AND MULTIRESOLUTION**
Olivier Bernard, Denis Friboulet, CREATIS-LRMN, France

MP.PA.13 **GRAPH-BASED KNOWLEDGE-DRIVEN DISCRETE SEGMENTATION OF THE LEFT VENTRICLE**
Ahmed Besbes, Ecole Centrale de Paris – GALEN Group INRIA Saclay, France; Nikos Komodakis, University of Crete, Greece; Nikos Paragios, Ecole Centrale de Paris – GALEN Group INRIA Saclay, France

MP.PA.14 **BAYESIAN CO-SEGMENTATION OF MULTIPLE MR IMAGES**
Jianfeng Xu, Feng Liang, University of Illinois at Urbana-Champaign, United States; Lixu Gu, Shanghai Jiaotong University, China

MP.PA.15 **ESTIMATION OF OXYGEN TENSION IN RETINAL CAPILLARIES FROM PHOSPHORESCENCE LIFETIME IMAGES**
Isa Yildirim, Rashid Ansari, Justin Wanek, University of Illinois at Chicago, United States; Imam Samil Yetik, Illinois Institute of Technology, United States; Mahnaz Shahidi, University of Illinois at Chicago, United States

MP.PB: Monday, June 29, 08:00 - 09:15

MP.PB **CAD P1** (Poster)
Time: Monday, June 29, 08:00 - 09:15
Place: Plaza Ballroom Area B
Chair: Miles Wernick, Illinois Institute of Technology

MP.PB.1 **AUTOMATED DETECTION OF DRUSEN IN THE MACULA**
David Freund, Neil Bressler, Philippe Burlina, Johns Hopkins University, United States

MP.PB.2 **CHARACTERIZING TIME-INTENSITY CURVES FOR SPECTRAL MORPHOMETRIC ANALYSIS OF INTRATUMORAL ENHANCEMENT PATTERNS IN BREAST DCE-MRI: COMPARISON BETWEEN DIFFERENTIATION PERFORMANCE OF TEMPORAL MODEL PARAMETERS BASED ON DFT AND SVD**

Sang Ho Lee, Jong Hyo Kim, Seoul National University College of Medicine, Republic of Korea; Jeong Seon Park, Hanyang University College of Medicine, Republic of Korea; Yun Sub Jung, Woo Kyung Moon, Seoul National University College of Medicine, Republic of Korea

MP.PB.3 **ROBUST ESTIMATION OF PHARMACOKINETIC PARAMETERS IN DCE-MRI ANALYSIS OF RECTAL TUMOURS**

Lydia Tanner, Nick Hughes, Michael Brady, University of Oxford, United Kingdom; Mark Anderson, Fergus Gleeson, Churchill Hospital, United Kingdom

MP.PB.4 **PROSTATE CANCER LOCALIZATION WITH MULTISPECTRAL MRI BASED ON RELEVANCE VECTOR MACHINES**

Sedat Ozer, Illinois Institute of Tecnology, United States; Masoom A. Haider, Princess Margaret Hospital, Canada; Deanne L. Langer, University of Toronto, Canada; Theodorus H. van der Kwast, Andrew J. Evans, Toronto General Hospital, Canada; Miles N. Wernick, Illinois Institute of Technology, United States; John Trachtenberg, University of Toronto, Canada; Imam Samil Yetik, Illinois Institute of Technology, United States

MP.PB.5 **A KNOWLEDGE REPRESENTATION FRAMEWORK FOR INTEGRATION, CLASSIFICATION OF MULTI-SCALE IMAGING AND NON-IMAGING DATA: PRELIMINARY RESULTS IN PREDICTING PROSTATE CANCER RECURRENCE BY FUSING MASS SPECTROMETRY AND HISTOLOGY**

George Lee, Scott Doyle, James Monaco, Rutgers University, United States; Michael Feldman, Stephen Master, John Tomaszewski, University of Pennsylvania, United States; Anant Madabhushi, Rutgers University, United States

MP.PB.6 **DETECTION OF CLUSTERED MICROCALCIFICATIONS USING SPATIAL POINT PROCESS MODELING**

Hao Jing, Yongyi Yang, Illinois Institute of Technology, United States

MP.PB.7 **A PILOT STUDY EVALUATING PULMONARY NODULE MARKING METHODS**

Alberto M. Biancardi, Anthony P. Reeves, David F. Yankelevitz, Cornell University, United States; Dana C. Ghiorghiu, Marietta L. J. Scott, Helen Mann, AstraZeneca, United Kingdom

MP.PB.8 **FALSE POSITIVE REDUCTION IN CT COLONOGRAPHY USING SPECTRAL COMPRESSION AND CURVATURE TENSOR SMOOTHING OF SURFACE GEOMETRY**
Ju Lynn Ong, Abd-Krim Seghouane, NICTA, Australia

MP.PB.9 **TEXTURE-BASED CHARACTERIZATION OF ARTERIALIZATION IN SIMULATED MRI OF HYPERVASCULARIZED LIVER TUMORS**
Muriel Mescam, Medical College of Wisconsin, United States; Marek Kretowski, Bialystok Technical University, Poland; Johanne Bézy-Wendling, Université de Rennes 1 - INSERM, France

MP.PB.10 **A FRAMEWORK FOR AUTOMATED TUMOR DETECTION IN THORACIC FDG PET IMAGES USING TEXTURE-BASED FEATURES**
Vijaya Saradhi Gannavaram, Girish Gopalakrishnan, Arunabha Roy, Rakesh Mullick, Ravi Manjeshwar, GE Global Research, India; Kris Thielemans, GE Healthcare, United Kingdom; Uday Patil, GE Global Research, India

MP.PC: Monday, June 29, 08:00 - 09:15

MP.PC **MRI** (Poster)
Time: Monday, June 29, 08:00 - 09:15
Place: Plaza Ballroom Area C
Chair: Brad Sutton, University of Illinois at Urbana-Champaign

MP.PC.1 **ADAPTIVE TOTAL VARIATION BASED FILTERING FOR MRI IMAGES WITH SPATIALLY INHOMOGENEOUS NOISE AND ARTIFACTS**
Weihong Guo, University of Alabama, United States; Feng Huang, Invivo Corporation, United States

MP.PC.2 **TEMPLATE-BASED RECONSTRUCTION OF HUMAN EXTRAOCULAR MUSCLES FROM MAGNETIC RESONANCE IMAGES**
Qi Wei, Shinjiro Sueda, University of British Columbia, Canada; Joel Miller, Smith-Kettlewell Eye Research Institute, United States; Joseph Demer, University of California, Los Angeles, United States; Dinesh Pai, University of British Columbia, Canada

MP.PC.3 **AUTOMATIC SEGMENTATION OF HEAD STRUCTURES ON FETAL MRI**
Jérémie Anquez, Elsa Angelini, Isabelle Bloch, TELECOM ParisTech, France

MP.PC.4 **3D EIGENFUNCTION EXPANSION OF SPARSELY SAMPLED 2D CORTICAL DATA**
Moo K. Chung, Yu-Chien Wu, Andrew L. Alexander, University of Wisconsin-Madison, United States

MP.PC.5 **EFFICIENT NUFFT ALGORITHM FOR NON-CARTESIAN MRI RECONSTRUCTION**
Zhili Yang, Mathews Jacob, University of Rochester, United States

MP.PC.6 **SELF-NAVIGATED IDEAL WATER-FAT SEPARATION WITH VARIABLE K-SPACE AVERAGING**
Yun Jiang, Michael S. Hansen, Jeffrey Tsao, Novartis Institutes for BioMedical Research, Inc., United States

MP.PC.7 **THE MULTIVARIATE A/C/E MODEL AND THE GENETICS OF FIBER ARCHITECTURE**
Agatha Lee, Natasha Lepore, Yi-yu Chou, Caroline Brun, Marina Barysheva, Ming-Chiang Chang, Sarah Madson, University of California, Los Angeles, United States; Katie L. McMahon, Greig I. de Zubicaray, Margaret J. Wright, University of Queensland, Australia; Arthur W. Toga, Paul M. Thompson, University of California, Los Angeles, United States

MP.PC.8 **MULTIVARIATE TENSOR-BASED MORPHOMETRY ON SURFACES: APPLICATION TO MAPPING VENTRICULAR CHANGES IN HIV/AIDS**
Yalin Wang, University of California, Los Angeles, United States; Jie Zhang, University of Wisconsin-Madison, United States; Tony F. Chan, Arthur W. Toga, Paul M. Thompson, University of California, Los Angeles, United States

MP.PC.9 **PARTIAL VOLUME ESTIMATION OF BRAIN CORTEX FROM MRI USING TOPOLOGY-CORRECTED SEGMENTATION**
Andrea Rueda, Universidad Nacional de Colombia and CSIRO ICTC, Colombia; Oscar Acosta, Pierrick Bourgeat, Jurgen Fripp, Erik Bonner, Nicholas Dowson, CSIRO ICT Centre, Australia; Michel Couprie, Universite Paris-Est, France; Eduardo Romero, Universidad Nacional de Colombia, Colombia; Olivier Salvado, CSIRO ICT Centre, Australia

MP.PC.10 **TOWARDS IRON OXIDE NANOPARTICLES QUANTIZATION IN MOLECULAR MR IMAGES BY DEFAULT FIELD DECONVOLUTION**
Delphine Charpigny, Thomas Grenier, Christophe Odet, Hugues Benoit-Cattin, CREATIS-LRMN, France

MP.PD **Reconstruction** (Poster)
Time: Monday, June 29, 08:00 - 09:15
Place: Plaza Ballroom Area D
Chair: Synho Do, Massachusetts General Hospital and Harvard Medical School

MP.PD.1 **IMPROVING M/EEG SOURCE LOCALIZATION WITH AN INTER-CONDITION SPARSE PRIOR**
Alexandre Gramfort, INRIA- ENS Paris, France; Matthieu Kowalski, LATP, CMI, Université de Provence, France

MP.PD.2 **3-D RECONSTRUCTIONS OF NANOMETER-SCALE HELICAL OBJECTS FROM CRYO ELECTRON MICROSCOPY IMAGES**
Seunghee Lee, Purdue University, United States; Qiaoyun Chen, Peter C. Doerschuk, Cornell University, United States

MP.PD.3 **GENERALIZED SIDELOBE CANCELLER FOR MAGNETOENCEPHALOGRAPHY ARRAYS**
John C. Mosher, Cleveland Clinic Neurological Institute, United States; Matti S. Hämäläinen, Martinos Center for Biomedical Imaging, United States; Dimitrios Pantazis, Hua Brian Hui, University of Southern California, United States; Richard Burgess, Cleveland Clinic Neurological Institute, United States; Richard M. Leahy, University of Southern California, United States

MP.PD.4 **IMAGING THE ELECTRICAL ACTIVITY OF THE HEART USING A KALMAN FILTER BASED APPROACH: COMPARISON OF RESULTS USING DIFFERENT STM'S**
Yesim Serinagaoglu, Umit Aydin, Middle East Technical University, Turkey

MP.PD.5 **TIME RESOLVED FLUORESCENCE DIFFUSE OPTICAL TOMOGRAPHY USING MULTI-RESOLUTION EXPONENTIAL B-SPLINES**
Nicolas Ducros, CEA, France; Anabela Da Silva, Institut Fresnel, France; Jean-Marc Dinten, CEA, France; Chandra Sekhar Seelamantula, Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Françoise Peyrin, CREATIS-LRMN, France

MP.PD.6 **MRI RESOLUTION ENHANCEMENT USING TOTAL VARIATION REGULARIZATION**
Shantanu Joshi, University of California, Los Angeles, United States; Antonio Marquina, Universidad de Valencia, Spain; Stanley Osher, Ivo Dinov, John Van Horn, Arthur W. Toga, University of California, Los Angeles, United States

MP.PD.7 **A NEW STATISTICAL IMAGE RECONSTRUCTION ALGORITHM FOR POLYENERGETIC X-RAY CT**
Monica Abella, Hospital General Universitario Gregorio Marañón, Spain; Jeffrey A. Fessler, University of Michigan, United States

MP.PD.8 **ALGORITHMS FOR SORTING AND RECONSTRUCTING HETEROGENEOUS NANOSCALE BIOLOGICAL OBJECTS FROM CRYO ELECTRON MICROSCOPY IMAGES**
Yili Zheng, Lawrence Berkeley National Laboratory, United States; Peter C. Doerschuk, Cornell University, United States

MP.PD.9 **INTEGRATED MODELING AND RECONSTRUCTION WITH SPARSITY CONSTRAINTS FOR FDOT**
Jean-Charles Baritaux, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Matthieu Guerquin-Kern, EPFL STI LIB, Switzerland; Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland

MP.PD.10 **SPACE-TIME IMAGE RECONSTRUCTION ALGORITHM FOR DIVERSE ULTRASOUND TRANSDUCER ELEMENT DISTRIBUTIONS**
Michael Lee, University of California, Los Angeles, United States; Rahul Singh, University of California, Santa Barbara, United States; Martin Culjat, Shyam Natarajan, Brian Cox, University of California, Los Angeles, United States; Elliott Brown, University of California, Santa Barbara, United States; Warren Grundfest, University of California, Los Angeles, United States; Hua Lee, University of California, Santa Barbara, United States

MP.PD.11 **DIRECT ADAPTIVE ALGORITHMS FOR CT RECONSTRUCTION**
Joseph Shtok, Michael Elad, Michael Zibulevsky, Technion IIT, Israel

MP.PD.12 **MULTI GPU IMPLEMENTATION OF ITERATIVE TOMOGRAPHIC RECONSTRUCTION ALGORITHMS**
Byunghyun Jang, David Kaeli, Northeastern University, United States; Synho Do, Homer Pien, Massachusetts General Hospital, United States

MP.PD.13 **A METHOD FOR CONTINUOUS ACCELERATED ECHO-PLANAR IMAGING WITH SELF-REFERENCED PARALLEL MR RECONSTRUCTION AND ARTIFACT CORRECTION**
W. Scott Hoge, Brigham and Women's Hospital, United States; Huan Tan, Robert A. Kraft, Virginia Tech-Wake Forest University, United States

MP.PD.14 **WAVELET-REGULARIZED RECONSTRUCTION FOR RAPID MRI**
Matthieu Guerquin-Kern, Dimitri Van De Ville, Cédric Vonesch, Jean-Charles Baritaux, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Klaas P. Pruessmann, University and ETH Zurich, Switzerland; Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland

MP.PD.15 **DIFFUSION OPTICAL TOMOGRAPHY USING ENTROPIC PRIORS**
Christos Panagiotou, University College London, United Kingdom; Sangeetha Somayajula, University of Southern California, United States; Adam Gibson, Martin Schweiger, University College London, United Kingdom; Richard M. Leahy, University of Southern California, United Kingdom; Simon Arridge, University College London, United Kingdom

MP.PD.16 **ZERO-ORDER-FREE IMAGE RECONSTRUCTION IN DIGITAL HOLOGRAPHIC MICROSCOPY**
Chandra Sekhar Seelamantula, Nicolas Pavillon, Christian Depeursinge, Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland

MP.PD.17 **NEURAL DYNAMICS OF 3-D OBJECT PERCEPTION ASSESSED BY COMBINED MEG/ FMRI IMAGING TECHNIQUE**
Sunao Iwaki, Natl Inst of Adv Industrial Sci & Tech (AIST), Japan; Giorgio Bonmassar, John W. Belliveau, Massachusetts General Hospital, United States

MP.PE: Monday, June 29, 08:00 - 09:15

MP.PE **Strain Imaging P1** (Poster)
Time: Monday, June 29, 08:00 - 09:15
Place: Plaza Ballroom Area E
Chair: Miles Wernick, Illinois Institute of Technology

MP.PE.1 **ROBUST ELASTICITY IMAGING USING EXTERNAL TRACKER**
Pezhman Foroughi, Gregory Hager, Emad Boctor, Johns Hopkins University, United States

MP.PE.2 **DEFORMABLE MESH MODEL OF CARDIAC MOTION FROM TAGGED MRI DATA**
Felipe Parages, Miles N. Wernick, Illinois Institute of Technology, United States; Thomas Denney, Jr., Auburn University, United States; Jovan Brankov, Illinois Institute of Technology, United States

MO1.R1: Monday, June 29, 10:45 - 12:05

MO1.R1 **Segmentation I** (Lecture)
Time: Monday, June 29, 10:45 - 12:05
Place: Georgian
Chair: Dimitris Metaxas, Rutgers University

10:45 - 11:05
MO1.R1.1 **A DATA-DRIVEN APPROACH TO DISCOVERING COMMON BRAIN ANATOMY**
Neil Weisenfeld, Simon K. Warfield, Children's Hospital Boston/Harvard Medical School, United States

11:05 - 11:25
MO1.R1.2 **CEREBELLUM SEGMENTATION IN MRI USING ATLAS REGISTRATION AND LOCAL MULTI-SCALE IMAGE DESCRIPTORS**
Fedde van der Lijn, Marleen de Bruijne, Yoo Young Hoogendam, Stefan Klein, Reinhard Hameeteman, Monique Breteler, Wiro Niessen, Erasmus MC, Netherlands

11:25 - 11:45
MO1.R1.3 **WAVELET-DRIVEN KNOWLEDGE-BASED MRI CALF MUSCLE SEGMENTATION**
Salma Essafi, Ecole Centrale Paris / INRIA SACLAY, France; Georg Langs, Medical University of Vienna, France; Jean François Deux, Alain Rahmouni, Guillaume Bassez, Centre Hospitalier Universitaire Henri Mondor, France; Nikos Paragios, Ecole Centrale Paris / INRIA SACLAY, France

11:45 - 12:05
MO1.R1.4 **SEGMENTATION OF INFLAMED SYNOVIA IN MULTI-MODAL 3D MRI**
Curzio Basso, Matteo Santoro, Alessandro Verri, Università di Genova, Italy; Mario Esposito, Università di Napoli, Italy

MO1.R2: Monday, June 29, 10:45 - 12:05

MO1.R2 **CAD in Imaging** (Lecture)
Time: Monday, June 29, 10:45 - 12:05
Place: Arlington
Chair: Marius George Linguraru, National Institutes of Health

10:45 - 11:05
MO1.R2.1 **PROBABILISTIC BRANCHING NODE DETECTION USING HYBRID LOCAL FEATURES**
Haibin Ling, Michael Barnathan, Vasileios Megalooikonomou, Temple University, United States; Predrag Bakic, Andrew Maidment, University of Pennsylvania, United States

11:05 - 11:25
MO1.R2.2 **LESION-SPECIFIC CORONARY ARTERY CALCIUM QUANTIFICATION BETTER PREDICTS CARDIAC EVENTS**
Zhen Qian, Idean Marvasty, Hunt Anderson, Sarah Rinehart, Szilard Voros, Piedmont Healthcare, United States

11:25 - 11:45
MO1.R2.3 **COMPUTER AIDED EVALUATION OF PLEURAL EFFUSION USING CHEST CT IMAGES**
Jianhua Yao, Wei Han, Ronald M. Summers, National Institutes of Health, United States

11:45 - 12:05
MO1.R2.4 **A NON-PARAMETRIC APPROACH TO AUTOMATIC CHANGE DETECTION IN MRI IMAGES OF THE BRAIN**
Hae Jong Seo, Peyman Milanfar, University of California, Santa Cruz, United States

MO1.R3 **Super-Resolution Processing in Medical Imaging** (Special Session)
Time: Monday, June 29, 10:45 - 12:05
Place: Berkeley/Clarendon
Chair: Denis Kouame, Universite de Toulouse

10:45 - 11:05
MO1.R3.1 **SUPER-RESOLUTION IN MEDICAL IMAGING : AN ILLUSTRATIVE APPROACH THROUGH ULTRASOUND**
Denis Kouame, University of Toulouse, France; Marie Ploquin, University of Tours, France

11:05 - 11:25
MO1.R3.2 **IMPLEMENTATION AND OPTIMIZATION OF A NEW SUPER-RESOLUTION TECHNIQUE IN PET IMAGING**
Guoping Chang, Rice University, United States; Tinsu Pan, M.D. Anderson Cancer Center, United States; John Clark, Rice University, United States; Osama Mawlawi, M.D. Anderson Cancer Center, United States

11:25 - 11:45
MO1.R3.3 **REGULARIZED SUPER-RESOLUTION OF BRAIN MRI**
Avraham Ben-Ezra, Hayit Greenspan, Tel-Aviv University, Israel; Yossi Rubner, RTC vision, Israel

11:45 - 12:05
MO1.R3.4 **SUPERRESOLUTION IN ULTRASOUND IMAGING**
Greg Clement, Harvard Medical School, United States

MO1.R4: Monday, June 29, 10:45 - 12:05

MO1.R4 **MRI Reconstruction Algorithms** (Lecture)
Time: Monday, June 29, 10:45 - 12:05
Place: Stanbro
Chair: W. Scott Hoge, Brigham & Womens Hospital

10:45 - 11:05
MO1.R4.1 **FAST ALGORITHMS FOR NONCONVEX COMPRESSIVE SENSING: MRI RECONSTRUCTION FROM VERY FEW DATA**
Rick Chartrand, Los Alamos National Laboratory, United States

11:05 - 11:25
MO1.R4.2 **SUPER-RESOLUTION RECONSTRUCTION OF MR IMAGE SEQUENCES WITH CONTRAST MODELING**
Justin Haldar, Diego Hernando, Zhi-Pei Liang, University of Illinois at Urbana-Champaign, United States

11:25 - 11:45
MO1.R4.3 **TOEPLITZ RANDOM ENCODING MR IMAGING USING COMPRESSED SENSING**
Dong Liang, Guangwu Xu, Haifeng Wang, University of Wisconsin-Milwaukee, United States; Kevin F. King, Dan Xu, Global Applied Science Lab, GE Healthcare, United States; Leslie Ying, University of Wisconsin-Milwaukee, United States

11:45 - 12:05
MO1.R4.4 **PRACTICAL NONCONVEX COMPRESSIVE SENSING RECONSTRUCTION OF HIGHLY-ACCELERATED 3D PARALLEL MR ANGIOGRAMS**
Joshua Trzasko, Clifton Haider, Armando Manduca, Mayo Clinic, United States

MO2.R1: Monday, June 29, 13:30 - 14:50

MO2.R1 **Segmentation II** (Lecture)
Time: Monday, June 29, 13:30 - 14:50
Place: Georgian
Chair: Michael Unser, Ecole Polytechnique Fédérale de Lausanne

13:30 - 13:50
MO2.R1.1 **PROSTATE CANCER SEGMENTATION WITH MULTISPECTRAL MRI USING COST-SENSITIVE CONDITIONAL RANDOM FIELDS**
Yusuf Artan, illinois Institute of Technology, United States; Deanne L. Langer, Masoom A. Haider, Theodorus H. van der Kwast, Andrew J. Evans, University of Toronto, Canada; Miles N. Wernick, Imam Samil Yetik, Illinois Institute of Technology, United States

13:50 - 14:10
MO2.R1.2 **SEGMENTING CT PROSTATE IMAGES USING POPULATION AND PATIENT-SPECIFIC STATISTICS FOR RADIOTHERAPY**
Qianjin Feng, South Medical University, China; Mark Foskey, Songyuan Tang, University of North Carolina, United States; Wufan Chen, South Medical University, China; Dinggang Shen, University of North Carolina, United States

14:10 - 14:30
MO2.R1.3 **DESIGN AND STUDY OF FLUX-BASED FEATURES FOR 3D VASCULAR TRACKING**
David Lesage, TELECOM ParisTech / Siemens Corporate Research, France; Elsa Angelini, Isabelle Bloch, TELECOM ParisTech, France; Gareth Funka-Lea, Siemens Corporate Research, United States

14:30 - 14:50
MO2.R1.4 **MAP-MRF SEGMENTATION OF LUNG TUMOURS IN PET/CT IMAGES**
Hugh Gribben, Paul Miller, Gerard Hanna, Queens University Belfast, United Kingdom; Kathryn Carson, Royal Victoria Hospital, United Kingdom; Alan Hounsell, Northern Ireland Cancer Centre, United Kingdom

MO2.R2: Monday, June 29, 13:30 - 14:50

MO2.R2 **Electron Microscopy** (Lecture)
Time: Monday, June 29, 13:30 - 14:50
Place: Arlington
Chair: Tolga Tazdizen, University of Utah

13:30 - 13:50
MO2.R2.1 **AB INITIO MAXIMUM LIKELIHOOD RECONSTRUCTION OF HELICAL MACROMOLECULES USING ELECTRON MICROSCOPY**
Min Woo Kim, Jong Chul Ye, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea

13:50 - 14:10
MO2.R2.2 **A FOURIER-BASED METHOD FOR DETECTING CURVED MICROTUBULE CENTERS: APPLICATION TO STRAIGHTENING OF CRYO-ELECTRON MICROSCOPE IMAGES**
Sophie Blestel, INRIA, IRISA/Univ. Rennes I, France; Charles Kervrann, INRIA, INRA, France; Denis Chrétien, CNRS, France

14:10 - 14:30
MO2.R2.3 **SPECIAL PURPOSE 3-D RECONSTRUCTION AND RESTORATION ALGORITHMS FOR ELECTRON MICROSCOPY OF NANOSCALE OBJECTS AND AN ENABLING SOFTWARE TOOLKIT**
Cory Prust, Purdue University, United States; Kang Wang, Yili Zheng, Peter C. Doerschuk, Cornell University, United States

14:30 - 14:50
MO2.R2.4 **CELL TRACKING AND SEGMENTATION IN ELECTRON MICROSCOPY IMAGES USING GRAPH CUTS**
Huei-Fang Yang, Yoonsuck Choe, Texas A&M University, United States

MO2.R3 **Image De-noising and Enhancement** (Lecture)
Time: Monday, June 29, 13:30 - 14:50
Place: Berkeley/Clarendon
Chair: Tom Denny, Auburn University

13:30 - 13:50
MO2.R3.1 **FAST HAAR-WAVELET DENOISING OF MULTIDIMENSIONAL FLUORESCENCE MICROSCOPY DATA**
Florian Luisier, Cédric Vonesch, Ecole Polytechnique Fédérale de Lausanne, Switzerland; Thierry Blu, Chinese University of Hong Kong, Hong Kong SAR of China; Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland

13:50 - 14:10
MO2.R3.2 **DENOISING FLUORESCENCE ENDOSCOPY – A MOTION COMPENSATED TEMPORAL RECURSIVE VIDEO FILTER WITH AN OPTIMAL MINIMUM MEAN SQUARE ERROR PARAMETERIZATION**
Thomas Stehle, Jonas Wulff, Alexander Behrens, Sebastian Gross, Til Aach, RWTH Aachen University, Germany

14:10 - 14:30
MO2.R3.3 **ULTRASOUND IMAGE DE-NOISING THROUGH KARHUNEN-LOEVE (K-L) TRANSFORM WITH OVERLAPPING SEGMENTS**
Jawad Al-Asad, Alireza Moghadamjoo, Leslie Ying, University of Wisconsin-Milwaukee, United States

14:30 - 14:50
MO2.R3.4 **AUTOMATIC CONTRAST ENHANCEMENT OF WHITE MATTER LESIONS IN FLAIR MRI**
April Khademi, University of Toronto, Canada; Anastasios Venetsanopoulos, Ryerson University, Canada; Alan Moody, Sunnybrook Health Sciences Center, Canada

MO2.R4: Monday, June 29, 13:30 - 14:50

MO2.R4 **CT Reconstruction** (Lecture)
Time: Monday, June 29, 13:30 - 14:50
Place: Stanbro
Chair: Mujdat Cetin, Sabanci University

13:30 - 13:50
MO2.R4.1 **MODEL-BASED IMAGE RECONSTRUCTION FOR DUAL-ENERGY X-RAY CT WITH FAST KVP SWITCHING**
Won Seok Huh, Jeffrey A. Fessler, University of Michigan, United States

13:50 - 14:10
MO2.R4.2 **ACCURATE MODEL-BASED HIGH RESOLUTION CARDIAC IMAGE RECONSTRUCTION IN DUAL SOURCE CT**
Synho Do, Sanghee Cho, Massachusetts General Hospital and Harvard Medical School, United States; W. Clem Karl, Boston University, United States; Mannudeep Kalra, Thomas Brady, Homer Pien, Massachusetts General Hospital and Harvard Medical School, United States

14:10 - 14:30
MO2.R4.3 **COMPRESSED SENSING METAL ARTIFACT REMOVAL IN DENTAL CT**
Jiyoung Choi, Minwoo Kim, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea; Won Seong, Chungnam National University, Republic of Korea; Jong Chul Ye, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea

14:30 - 14:50
MO2.R4.4 **MEASURING PATIENT MOTION IN HR-PQCT**
Yves Pauchard, Fabio Ayres, Steven Boyd, University of Calgary, Canada

MO3.R1: Monday, June 29, 15:00 - 16:20

MO3.R1 **Classification with Multiple Images** (Lecture)
Time: Monday, June 29, 15:00 - 16:20
Place: Georgian
Chair: Ahmed Tewfik, University of Minnesota

15:00 - 15:20
MO3.R1.1 **A CLASSIFIER ENSEMBLE BASED ON PERFORMANCE LEVEL ESTIMATION**
Wei Wang, Yaoyao Zhu, Xiaolei Huang, Daniel Lopresti, Lehigh University, United States; Zhiyun Xue, L. Rodney Long, Sameer Antani, George R. Thoma, National Library of Medicine, National Institutes of Health, United States

15:20 - 15:40
MO3.R1.2 **ENDOMICROSCOPIC IMAGE RETRIEVAL AND CLASSIFICATION USING INVARIANT VISUAL FEATURES**
Barbara Andre, Tom Vercauteren, Aymeric Perchant, Mauna Kea Technologies (MKT), France; Anna Buchner, Michael Wallace, Mayo Clinic, Division of Gastroenterology and Hepatology, United States; Nicholas Ayache, Asclepios Project-Team, INRIA Sophia-Antipolis, France

15:40 - 16:00
MO3.R1.3 **X-RAY IMAGE CATEGORIZATION AND RETRIEVAL USING PATCH-BASED VISUAL WORDS REPRESENTATION**
Uri Avni, Hayit Greenspan, Tel-Aviv University, Israel; Michal Sharon, Eli Konen, Sheba Medical Center, Israel; Jacob Goldberger, Bar-Ilan University, Israel

16:00 - 16:20
MO3.R1.4 **BRIDGING THE SEMANTIC GAP USING RANKING SVM FOR IMAGE RETRIEVAL**
Haiying Guan, Sameer Antani, L. Rodney Long, George R. Thoma, National Institutes of Health, United States

MO3.R2: Monday, June 29, 15:00 - 16:20

MO3.R2 **Registration I** (Lecture)
Time: Monday, June 29, 15:00 - 16:20
Place: Arlington
Chair: Ying Sun, National University of Singapore

15:00 - 15:20
MO3.R2.1 **AUTOMATED MULTI-MODALITY REGISTRATION OF 64-SLICE CORONARY CT ANGIOGRAPHY WITH MYOCARDIAL PERFUSION SPECT**
Jonghye Woo, University of Southern California, United States; Piotr Slomka, Damini Dey, Victor Cheng, Amit Ramesh, Cedars-Sinai Medical Center, United States; Byung-Woo Hong, Chung-Ang University, Republic of Korea; Daniel Berman, Cedars-Sinai Medical Center, United States; C.-C. Jay Kuo, University of Southern California, United States; Guido Germano, Cedars-Sinai Medical Center, United States

15:20 - 15:40
MO3.R2.2 **DETECTING BRAIN SHIFT DURING DEEP BRAIN STIMULATION SURGERY USING INTRA-OPERATIVE DATA AND FUNCTIONAL ATLASES: A PRELIMINARY STUDY**
Srivatsan Pallavaram, Pierre-François D'Haese, Vanderbilt University, United States; Michael Remple, Joseph Neimat, Chris Kao, Vanderbilt Medical Center, United States; Rui Li, Vanderbilt University, United States; Peter Konrad, Vanderbilt Medical Center, United States; Benoit Dawant, Vanderbilt University, United States

15:40 - 16:00
MO3.R2.3 **POSTURE MATCHING AND ELASTIC REGISTRATION OF A MOUSE ATLAS TO SURFACE TOPOGRAPHY RANGE DATA**
Anand Joshi, University of California, Los Angeles, United States; Abhijit Chaudhari, Changqing Li, University of California, Davis, United States; David Shattuck, University of California, Los Angeles, United States; Joyita Dutta, Richard M. Leahy, University of Southern California, United States; Arthur W. Toga, University of California, Los Angeles, United States

16:00 - 16:20
MO3.R2.4 **PRIOR AFFINITY MEASURES ON MATCHES FOR ICP-LIKE NONLINEAR REGISTRATION OF FREE-FORM SURFACES**
Benoit Combès, Sylvain Prima, INRIA, France

MO3.R3 **Large-Scale Physiological Modeling and Simulation Initiatives** (Special Session)
Time: Monday, June 29, 15:00 - 16:20
Place: Berkeley/Clarendon
Co-Chairs: Alejandro Frangi, Pompeau Fabra University, Marco Viceconti, Instituti Ortopedici Rizzoli and Peter Hunter, University Auckland

15:00 - 15:20
MO3.R3.1 **MOTILITY AND ABSORPTION IN THE SMALL INTESTINES: INTEGRATING MRI WITH LATTICE BOLTZMANN MODELS**
James Brasseur, Gino Banco, Amit Ailiani, Yanxing Wang, Thomas Neuberger, Nadine Smith, Andrew Webb, Pennsylvania State University, United States

15:20 - 15:40
MO3.R3.2 **AN INTEGRATIVE APPROACH TO CEREBROVASCULAR DISEASE HEALTHCARE: IT FOR CEREBRAL ANEURYSMS**
Paul Watton, University of Oxford, United Kingdom; Alejandro Frangi, Universitat Pompeu Fabra, Spain; Yiannis Ventikos, University of Oxford, United Kingdom

15:40 - 16:00
MO3.R3.3 **PROGRESS TOWARDS A MEDICAL IMAGE THROUGH CFD ANALYSIS TOOLKIT FOR RESPIRATORY FUNCTION ASSESSMENT ON A CLINICAL TIME SCALE**
Robert Kunz, Daniel Haworth, David Porzio, Pennsylvania State University, United States; Andres Kriete, Drexel University, United States

16:00 - 16:20
MO3.R3.4 **INTEGRATING BIOLOGICAL KNOWLEDGE, NOVEL IMAGING MODALITIES, AND MODELING IN BREAST CANCER DIAGNOSIS**
Nico Karssemeijer, Henkjan Huisman, Radboud University Nijmegen Medical Center, Netherlands; David J. Hawkes, John Hipwell, University College London, United Kingdom; Tobias Bohler, Fraunhofer Mevis, Bremen, Germany; Jan Lesniak, Christine Tanner, Gabor Székely, ETH Zurich, Switzerland; Wiro Niessen, Erasmus MC, University Medical Center Rotterdam / Delft University of Technology, Netherlands; Horst Hahn, Fraunhofer Mevis, Bremen, Germany

MO3.R4: Monday, June 29, 15:00 - 16:20

MO3.R4 **PET/SPECT I** (Lecture)
Time: Monday, June 29, 15:00 - 16:20
Place: Stanbro
Chair: Jeff Fessler, University of Michigan

15:00 - 15:20
MO3.R4.1 **DIRECT ESTIMATION OF PATLAK PARAMETERS FROM LIST MODE PET DATA**
Quanzheng Li, Richard M. Leahy, University of Southern California, United States

15:20 - 15:40
MO3.R4.2 **STRATEGIES TO JOINTLY OPTIMIZE SPECT COLLIMATOR AND RECONSTRUCTION PARAMETERS FOR A DETECTION TASK**
Lili Zhou, Santosh Kulkarni, Bin Liu, Gene Gindi, Stony Brook University, United States

15:40 - 16:00
MO3.R4.3 **A SIMULATION MODEL OF THE COUNTING-RATE RESPONSE OF CLINICAL PET SYSTEMS AND IT'S APPLICATION TO OPTIMIZE THE INJECTED RADIOACTIVE DOSE**
Nicolas Karakatsanis, Konstantina Nikita, National Technical University of Athens, Greece

16:00 - 16:20
MO3.R4.4 **DETECTION PERFORMANCE ANALYSIS FOR TIME-OF-FLIGHT PET**
Nannan Cao, University of California, Davis, United States; Ronald Huesman, William Moses, Lawrence Berkeley National Laboratory, United States; Jinyi Qi, University of California, Davis, United States

MO4.R1: Monday, June 29, 16:40 - 18:00

MO4.R1 **Classification** (Lecture)
Time: Monday, June 29, 16:40 - 18:00
Place: Georgian
Chair: Stephen Wong, The Methodist Hospital Research Institute

16:40 - 17:00
MO4.R1.1 **A RICIAN MIXTURE MODEL CLASSIFICATION ALGORITHM FOR MAGNETIC RESONANCE IMAGES**
Snehashis Roy, Aaron Carass, Pierre-Louis Bazin, Jerry L. Prince, Johns Hopkins University, United States

17:00 - 17:20
MO4.R1.2 **UNSUPERVISED CLASSIFICATION OF SKELETAL FIBERS USING DIFFUSION MAPS**
Radhouene Neji, Ecole Centrale Paris / INRIA Saclay / Supelec, France; Georg Langs, Medical University of Vienna, Austria; Jean François Deux, Mezri Maatouk, Alain Rahmouni, Guillaume Bassez, CHU Henri Mondor, France; Gilles Fleury, Supelec, France; Nikos Paragios, Ecole Centrale Paris / INRIA Saclay, France

17:20 - 17:40
MO4.R1.3 **FEATURE SPACE TRANSFORMATION FOR SEMI-SUPERVISED LEARNING FOR PROTEIN SUBCELLULAR LOCALIZATION IN FLUORESCENCE MICROSCOPY IMAGES**
Yu-Shi Lin, Yi-Hung Huang, Academia Sinica, Taiwan; Chung-Chih Lin, Yang-Ming University, Taiwan; Chun-Nan Hsu, Academia Sinica, Taiwan

17:40 - 18:00
MO4.R1.4 **CONCEPT DETECTION IN LONGITUDINAL BRAIN MR IMAGES USING MULTI-MODAL CUES**
Jesus Caban, University of Maryland, United States; Noah Lee, Columbia University, United States; Shahram Ebadollahi, IBM T. J. Watson Research Center, United States; Andrew Laine, Heffner Biomedical Imaging Laboratory, United States; John R Kender, Columbia University, United States

MO4.R2: Monday, June 29, 16:40 - 18:00

MO4.R2 **Registration II** (Lecture)
Time: Monday, June 29, 16:40 - 18:00
Place: Arlington
Chair: Miles Wernick, Medical Imaging Research Center, Illinois Institute of Technology

16:40 - 17:00
MO4.R2.1 **LINEAR IMAGE REGISTRATION THROUGH MRF OPTIMIZATION**
Ben Glocker, Darko Zikic, Technische Universität München, Germany; Nikos Komodakis, University of Crete, Greece; Nikos Paragios, Ecole Centrale de Paris, France; Nassir Navab, Technische Universität München, Germany

17:00 - 17:20
MO4.R2.2 **SPATIO-TEMPORAL IMAGE REGISTRATION FOR RESPIRATORY MOTION CORRECTION IN PET IMAGING**
Wenjia Bai, Michael Brady, Oxford University, United Kingdom

17:20 - 17:40
MO4.R2.3 **DISCRIMINATIVE SLIDING PRESERVING REGULARIZATION IN MEDICAL IMAGE REGISTRATION**
Dan Ruan, Stanford University, United States; Selim Esedoglu, Jeffrey A. Fessler, University of Michigan, United States

17:40 - 18:00
MO4.R2.4 **IMPROVED REGISTRATION FOR LARGE ELECTRON MICROSCOPY IMAGES**
Ayelet Akselrod-Ballin, Children's Hospital, Harvard Medical School, United States; Davi Bock, R. Clay Reid, Harvard Medical School, United States; Simon K. Warfield, Children's Hospital, Harvard Medical School, United States

MO4.R3: Monday, June 29, 16:40 - 18:00

MO4.R3 **Reconstruction and Modeling** (Lecture)
Time: Monday, June 29, 16:40 - 18:00
Place: Berkeley/Clarendon
Chair: Eric Miller, Tufts University

16:40 - 17:00
MO4.R3.1 **REDUCTION OF DISTORTIONS IN MRSI USING A NEW SIGNAL MODEL**
Ramin Eslami, Mathews Jacob, University of Rochester, United States

17:00 - 17:20
MO4.R3.2 **STATISTICAL MODELING OF THE GEOMETRIC ERROR IN CARDIAC ELECTRICAL IMAGING**
Umit Aydin, Yesim Serinagaoglu, Middle East Technical University, Turkey

17:20 - 17:40
MO4.R3.3 **OPTICAL PROPERTY CHARACTERIZATION BASED ON A PHASE FUNCTION APPROXIMATION MODEL**
Alexander Cong, Virginia Tech, United States; Yujie Lu, University of California, Los Angeles, United States; Wenxiang Cong, Haiou Shen, Virginia Tech, United States; Arion Chatziioannou, University of California, Los Angeles, United States; Ge Wang, Virginia Tech, United States

17:40 - 18:00
MO4.R3.4 **SOFOMORE: COMBINED EEG SOURCE AND FORWARD MODEL RECONSTRUCTION**
Carsten Stahlhut, Morten Mørup, Ole Winther, Lars Kai Hansen, Technical University of Denmark, Denmark

MO4.R4 **Strain Imaging** (Lecture)
Time: Monday, June 29, 16:40 - 18:00
Place: Stanbro
Chair: Lawrence Staib, Yale University

16:40 - 17:00
MO4.R4.1 **QUANTITATIVE VALIDATION OF OPTICAL FLOW BASED MYOCARDIAL STRAIN MEASURES USING SONOMICROMETRY**
Qi Duan, NYU School of Medicine, United States; Katherine Parker, University of Virginia, United States; Auranuch Lorsakul, Columbia University, United States; Elsa Angelini, TELECOM Paris Tech, France; Eiichi Hyodo, Shunichi Homma, Columbia University, United States; Jeffrey Holmes, University of Virginia, United States; Andrew Laine, Columbia University, United States

17:00 - 17:20
MO4.R4.2 **TRUHARP: SINGLE BREATH-HOLD MRI FOR HIGH RESOLUTION CARDIAC MOTION AND STRAIN QUANTIFICATION**
Harsh K. Agarwal, Khaled Z. Abd-Elmoniem, Jerry L. Prince, Johns Hopkins University, United States

17:20 - 17:40
MO4.R4.3 **FUNDAMENTAL ANALYSIS OF LATERAL DISPLACEMENT ESTIMATION QUALITY IN ULTRASOUND ELASTOGRAPHY**
Jianwen Luo, Elisa Konofagou, Columbia University, United States

17:40 - 18:00
MO4.R4.4 **3D LEFT VENTRICULAR STRAIN BY PHASE UNWRAPPING: A SIMULATED ANNEALING BASED BRANCH-CUT PLACEMENT METHOD**
Bharath Ambale, Thomas Denney, Jr., Auburn University, United States; Gupta Himanshu, Steven Lloyd, Louis Dell'Italia, University of Alabama at Birmingham, United States

TP.PA **Segmentation P2** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area A
Chair: Erik Meijering, Erasmus MC - University Medical Center Rotterdam

TP.PA.1 **SEGMENTATION OF SUBCORTICAL STRUCTURES AND THE HIPPOCAMPUS IN BRAIN MRI USING GRAPH-CUTS AND SUBJECT-SPECIFIC A-PRIORI INFORMATION**
Robin Wolz, Paul Aljabar, Rolf A. Heckemann, Alexander Hammers, Daniel Rueckert, Imperial College London, United Kingdom

TP.PA.2 **LESION DETECTION AND SEGMENTATION IN UTERINE CERVIX IMAGES USING AN ARC-LEVEL MRF**
Amir Alush, Hayit Greenspan, Tel-Aviv University, Israel; Jacob Goldberger, Bar-Ilan University, Israel

TP.PA.3 **SEGMENTATION OF SCOLIOTIC SPINE SILHOUETTES FROM ENHANCED BIPLANAR X-RAYS USING A PRIOR KNOWLEDGE BAYESIAN FRAMEWORK**
Samuel Kadoury, Farida Cheriet, Ecole Polytechnique de Montreal, Canada; Hubert Labelle, Sainte-Justine Hospital, Canada

TP.PA.4 **SHAPE-BASED CT LUNG NODULE SEGMENTATION USING FIVE-DIMENSIONAL MEAN SHIFT CLUSTERING AND MEM WITH SHAPE INFORMATION**
Xujiong Ye, Musib Siddique, Abdel Douiri, Gareth Beddoe, Greg Slabaugh, Medicsight PLC, United Kingdom

TP.PA.5 **AUTOMATIC DETECTION OF SUPRAAORTIC BRANCHES AND MODEL-BASED SEGMENTATION OF THE AORTIC ARCH FROM 3D CTA IMAGES**
Andreas Biesdorf, Stefan Wörz, University of Heidelberg, BIOQUANT, IPMB, and DKFZ Heidelberg, Germany; Hendrik von Tengg-Kobligk, German Cancer Research Center (DKFZ) Heidelberg, Germany; Karl Rohr, University of Heidelberg, BIOQUANT, IPMB, and DKFZ Heidelberg, Germany

TP.PA.6 **ACCURATE AND FAST 3D COLON SEGMENTATION IN CT COLONOGRAPHY**
Dongqing Chen, Rachid Fahmi, Aly Farag, Robert Falk, Gerald Dryden, University of Louisville, United States

TP.PA.7 **3D SEGMENTATION OF THE LIVER USING FREE-FORM DEFORMATION BASED ON BOOSTING AND DEFORMATION GRADIENTS**
Hong Zhang, Rutgers University, United States; Lin Yang, Rutgers university, United States; David Foran, John Nosher, Peter Yim, UMDNJ-Robert Wood Johnson Medical School, United States

TP.PA.8 **SEGMENTATION OF RODENT BRAINS FROM MRI BASED ON A NOVEL STATISTICAL STRUCTURE PREDICTION METHOD**
Jinghao Zhou, UMDNJ-Robert Wood Johnson Medical School, United States; Sukmoon Chang, Pennsylvania State University, United States; Shaoting Zhang, Rutgers University, United States; George Pappas, Michael Michaelides, Foteini Delis, Nora Volkow, Panayotis Thanos, Brookhaven National Laboratory, United States; Dimitris Metaxas, Rutgers University, United States

TP.PA.9 **AUTOMATIC EXTRACTION OF THE LEFT ATRIAL ANATOMY FROM MR FOR ATRIAL FIBRILLATION ABLATION**
Rashed Karim, Daniel Rueckert, Imperial College London, United Kingdom; Raad Mohiaddin, Peter Drivas, Royal Brompton Hospital, United Kingdom

TP.PA.10 **CLOUD BANK: A MULTIPLE CLOUDS MODEL AND ITS USE IN MR BRAIN IMAGE SEGMENTATION**
Paulo A. V. Miranda, Alexandre X. Falcão, University of Campinas, Brazil; Jayaram K. Udupa, University of Pennsylvania, United States

TP.PA.11 **AUTOMATED SEGMENTATION OF THE MENISCI FROM MR IMAGES**
Jurgen Fripp, Pierrick Bourgeat, The Australian e-Health Research Centre, Australia; Craig Engstrom, University of Queensland, Australia; Sebastien Ourselin, Centre for Medical Image Computing, United Kingdom; Stuart Crozier, University of Queensland, Australia; Olivier Salvado, The Australian e-Health Research Centre, Australia

TP.PA.12 **BALLS HIERARCHY: IMAGE SEGMENTATION BY GRAPH SPANNER**
Sinan Kockara, Vincent Yip, University of Central Arkansas, United States; Mutlu Mete, University of Arkansas for Medical Sciences, United States

TP.PA.13 **NUCLEAR SEGMENTATION IN MICROSCOPE CELL IMAGES: A HAND-SEGMENTED DATASET AND COMPARISON OF ALGORITHMS**
Luis Pedro Coelho, Aabid Shariff, Robert F. Murphy, Carnegie Mellon University, United States

TP.PA.14 **SEGMENTATION OF 3D CARDIAC ULTRASOUND IMAGES USING CORRELATION OF RADIO FREQUENCY DATA**
Maartje Nillesen, Richard Lopata, Inge Gerrits, Henkjan Huisman, Johan Thijssen, Livia Kapusta, Chris de Korte, Radboud University Nijmegen Medical Centre, Netherlands

TP.PA.15 **GPU IMPLEMENTATION OF MAP-MRF FOR MICROSCOPY IMAGERY SEGMENTATION**
Danny Crookes, Paul Miller, Hugh Gribben, Charles Gillan, Damian McCaughey, Queens University Belfast, United Kingdom

TP.PB **CAD P2** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area B
Chair: Yongyi Yang, Illinois Institute of Technology

TP.PB.1 **A NUMERICAL MODEL SIMULATING SOUND PROPAGATION IN HUMAN THORAX**
Sridhar Ramakrishnan, Satish Udpa, Lalita Udpa, Michigan State University, United States

TP.PB.2 **CLASSIFICATION OF 3D FACE SHAPE IN 22Q11.2 DELETION SYNDROME**
Katarzyna Wilamowska, Linda Shapiro, University of Washington, United States; Carrie Heike, Seattle Children's Hospital, United States

TP.PB.3 **AUTOMATIC EXTRACTION OF ANATOMICAL LANDMARKS FROM MEDICAL IMAGE DATA: AN EVALUATION OF DIFFERENT METHODS**
Heiko Seim, Dagmar Kainmueller, Zuse Institute Berlin, Germany; Markus Heller, Julius Wolff Institut, Germany; Stefan Zachow, Hans-Christian Hege, Zuse Institute Berlin, Germany

TP.PB.4 **A COMPUTER-AIDED DIAGNOSIS SYSTEM FOR WHOLE BODY BONE SCAN USING SINGLE PHOTON EMISSION COMPUTED TOMOGRAPHY**
Sheng-Fang Huang, Tzu Chi University, Taiwan; Hao-Yu Chao, Buddhist Tzu Chi General Hospital, Taiwan; Cheng-Chin Hsu, Shan-Fong Yang, Tzu Chi University, Taiwan; Pan-Fu Kao, Chung Shan Medical University Hospital, Taiwan

TP.PB.5 **DESICCATION DIAGNOSIS IN LUMBAR DISCS FROM CLINICAL MRI WITH A PROBABILISTIC MODEL**
Raja' Alomari, Jason Corso, Vipin Chaudhary, Gurmeet Dhillon, University at Buffalo, SUNY, United States

TP.PB.6 **AN OPTIMIZED SET OF 3D FRACTAL AND MULTIFRACTAL FEATURES FOR THE EPILEPTOGENIC FOCUS CHARACTERIZATION IN SPECT IMAGING**
Renaud Lopes, Maximilien Vermandel, Anne-Sophie Dewalle-Vignion, INSERM, U703, France; Salah Maouche, LAGIS CNRS, France; Nacim Betrouni, INSERM, U703, France

TP.PB.7 **IDENTIFICATION OF ULCERS IN WIRELESS CAPSULE ENDOSCOPY VIDEOS**
Alexandros Karargyris, Nikolaos Bourbakis, Wright State University, United States

TP.PB.8 **DETECTION OF RED LESIONS IN DIGITAL FUNDUS IMAGES**
Giri Babu Kande, Vasireddy Venkatadri Institute of Technology, India; Satya Savithri Tirumala, JNTU, India; Venkata Subbaiah P, Amrita Sai Institute of Science & Technology, India; Ravindranath Tagore M, Vasireddy Venkatadri Institute of Technology, India

TP.PB.9 **ALGORITHMIC FRAMEWORK FOR HEP-2 FLUORESCENCE PATTERN CLASSIFICATION TO AID AUTO-IMMUNE DISEASES DIAGNOSIS**
Pierre Elbischger, Carinthia University of Applied Sciences, Austria; Stig Geerts, Artesis University College of Antwerp, Belgium; Kathrin Sander, Carinthia University of Applied Sciences, Austria; Gerda Ziervogel-Lukas, Pranav Sinha, Province Hospital Klagenfurt, Austria

TP.PB.10 **NON-INVASIVE DIFFERENTIAL DIAGNOSIS OF DENTAL PERIAPICAL LESIONS IN CONE-BEAM CT**
Arturo Flores, Steve Rysavy, San Francisco State University, United States; Reyes Enciso, University of Southern California, United States; Kazunori Okada, San Francisco State University, United States

TP.PB.11 **A-CONTRARIO LOCALIZATION OF EPILEPTOGENIC ZONES IN SPECT IMAGES**
Cecilia Aguerrebere, Pablo Sprechmann, Pablo Musé, Rodolfo Ferrando, Universidad de la República, Uruguay

TP.PC: Tuesday, June 30, 08:00 - 09:15

TP.PC **CT: Reconstruction and Applications** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area C
Chair: Ge Wang, Virginia Polytechnic Institute & State University

TP.PC.1 **CORRECTING PHASE CONTRAST ARTEFACTS IN X-RAY CT IMAGING**
Yoni De Witte, Matthieu Boone, Jelle Vlassenbroeck, Manuel Dierick, Bert Masschaele, Luc Van Hoorebeke, Veerle Cnudde, Ghent University, Belgium

TP.PC.2 **CT IMAGE CONSTRUCTION OF THE LUNG IN A TOTALLY DEFLATED MODE**
Ali Sadeghi Naini, Rajni Patel, Abbas Samani, University of Western Ontario, Canada

TP.PC.3 **4D TIME-RESOLVED IN-VIVO MICROTOMOGRAPHY**
Alexander Sasov, Xuan Liu, Phil Salmon, SkyScan, Belgium

TP.PC.4 **THE MINIMAL ENTROPY PRIOR FOR SIMULTANEOUS RECONSTRUCTION AND SEGMENTATION OF IN VIVO MICROCT TRABECULAR BONE IMAGES**
Maarten Depypere, Johan Nuyts, Kjell Laperre, Geert Carmeliet, Frederik Maes, Paul Suetens, K.U.Leuven, Belgium

TP.PC.5 **A 2D-SPLINE PATIENT SPECIFIC MODEL FOR USE IN RADIATION THERAPY**
Hadi Fayad, INSERM U650, France; Tinsu Pan, M.D. Anderson Cancer Center, United States; Christian Roux, INSERM U650 - Institut Telecom - Telecom Bretagne, France; Catherine Cheze Le Rest, INSERM U650, France; Olivier Pradier, CHU Brest, France; Dimitris Visvikis, INSERM U650, France

TP.PC.6 **IMAGE-BASED STRUCTURE-TO-FUNCTION CORRELATION OF TISSUE ENGINEERING SCAFFOLDS**
Srinivasan Rajagopalan, Robb Richard, Mayo Clinic College of Medicine, United States

TP.PC.7 **A CORRECTION FRAMEWORK FOR NON-IDEAL SOURCE SWITCHING IN DUAL ENERGY CT SCANNER**
Julia Pavlovich, Andrew Litvin, Aleksander Roshi, Sergey Simanovsky, Ram Naidu, Analogic Corporation, United States

TP.PC.8 **3D NON-LINEAR ENHANCEMENT OF TUBULAR MICROSCOPIC BONE POROSITIES**
Alexandra Pacureanu, Aymeric Larrue, Zsolt Peter, Françoise Peyrin, Inserm, U630; CNRS, UMR5220, France

TP.PC.9 **PATHS OF LEAST FLOW-RESISTANCE: CHARACTERIZATION FOR THE OPTIMIZATION OF SYNTHETIC TISSUE SCAFFOLD DESIGN**
Timothy Kline, Erik Ritman, Mayo Clinic College of Medicine, United States

TP.PC.10 **REPRODUCIBILITY OF IMAGE-BASED COMPUTATIONAL HEMODYNAMICS IN INTRACRANIAL ANEURYSMS: COMPARISON OF CTA AND 3DRA**
Arjan Geers, Universitat Pompeu Fabre and CIBER-BBN, Spain; Ignacio Larrabide, CIBER-BBN and Universitat Pompeu Fabre, Spain; Alessandro Radaelli, Hrvoje Bogunovic, Universitat Pompeu Fabre and CIBER-BBN, Spain; Hugo Gratama van Andel, Charles Majoie, University of Amsterdam (AMC), Netherlands; Alejandro Frangi, Universitat Pompeu Fabre, CIBER-BBN, and ICREA, Spain

TP.PD **DTI P1** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area D
Chair: Anastasia Yendiki, HMS/MGH/MIT Athinoula A. Martinos Center for Biomedical Imaging

TP.PD.1 **MESH-BASED SPHERICAL DECONVOLUTION FOR PHYSICALLY VALID FIBER ORIENTATION RECONSTRUCTION FROM DIFFUSION-WEIGHTED MRI**
Vishal Patel, Yonggang Shi, Paul M. Thompson, Arthur W. Toga, University of California, Los Angeles, United States

TP.PD.2 **TERNARY QUARTIC APPROACH FOR POSITIVE 4TH ORDER DIFFUSION TENSORS REVISITED**
Aurobrata Ghosh, INRIA Méditerranée, France; Maher Moakher, Ecole Nationale d'Ingénieurs de Tunis (ENIT), Tunisia; Rachid Deriche, INRIA Méditerranée, France

TP.PD.3 **WHITE MATTER INTEGRITY MEASURED BY FRACTIONAL ANISOTROPY CORRELATES POORLY WITH ACTUAL INDIVIDUAL FIBER ANISOTROPY**
Alex D. Leow, Liang Zhan, Siwei Zhu, Nathan Hageman, Ming-Chang Chiang, Marina Barysheva, Arthur W. Toga, University of California, Los Angeles, United States; Katie L. McMahon, Greig I. de Zubicaray, University of Queensland, Functional MRI Laboratory, Centre for Magnetic Resonance, Australia; Margaret J. Wright, Queensland Institute of Medical Research, Australia; Paul M. Thompson, University of California, Los Angeles, United States

TP.PD.4 **A PHYSICAL BASIS FOR MULTI-FIBER RECONSTRUCTION FROM DW-MRI DATA**
Ritwik Kumar, Angelos Barmpoutis, Baba Vemuri, Paul Carney, Thomas Mareci, University of Florida, United States

TP.PD.5 **ANATOMICAL PRIORS FOR GLOBAL PROBABILISTIC DIFFUSION TRACTOGRAPHY**
Anastasia Yendiki, Allison Stevens, Jean Augustinack, David Salat, Lilla Zollei, Bruce Fischl, HMS/MGH/MIT Athinoula A. Martinos Center for Biomedical Imaging, United States

TP.PD.6 **4TH ORDER DIFFUSION TENSOR INTERPOLATION WITH DIVERGENCE AND CURL CONSTRAINED BEZIER PATCHES**
Inas Yassine, Tim McGraw, West Virginia University, United States

TP.PD.7 **HUMAN OPTIC NERVE DTI WITH EPI GEOMETRIC DISTORTION CORRECTION**
Udomchai Techavipoo, National Electronics and Computer Technology Center, Thailand; Annette Okai, John Lackey, Jianrong Shi, Thomas Jefferson University, United States; Alex Dresner, Philips Medical Systems, United States; Thomas Leist, Song Lai, Thomas Jefferson University, United States

TP.PD.8 **ANALYSIS OF FIBER ORIENTATION IN NORMAL AND FAILING HUMAN HEARTS USING DIFFUSION TENSOR MRI**
Michael Eggen, Cory Swingen, Paul Iaizzo, University of Minnesota, United States

TP.PE: Tuesday, June 30, 08:00 - 09:15

TP.PE **fMRI** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area E
Chair: Anastasia Yendiki, HMS/MGH/MIT Athinoula A. Martinos Center for Biomedical Imaging

TP.PE.1 **DYNAMIC IMAGING OF COGNITIVE IMPAIRMENT IN NICOTINE-DEPRIVED SUBJECTS USING SIMULTANEOUS EEG/FMRI**
Christopher Long, David Cole, Michael Durcan, Paul Matthews, John Beaver, GlaxoSmithKline, United Kingdom

TP.PE.2 **DETECTING MAXIMAL DIRECTIONAL CHANGES IN SPATIAL FMRI RESPONSE USING CANONICAL CORRELATION ANALYSIS**
Bernard Ng, Rafeef Abugharbieh, Martin McKeown, University of British Columbia, Canada

TP.PE.3 **INCREASING TEMPORAL RESOLUTION IN HYBRID 3D EPI FMRI STUDIES USING UNFOLD**
Onur Afacan, Northeastern University, United States; W. Scott Hoge, Harvard Medical School & Brigham and Women's Hospital, United States; Dana H. Brooks, Northeastern University, United States; Istvan A. Morocz, Harvard Medical School & Brigham and Women's Hospital, United States

TP.PF: Tuesday, June 30, 08:00 - 09:15

TP.PF **Restoration** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area F
Chair: Yongang Shi, UCLA School of Medicine

TP.PF.1 **AN ULTRASOUND IMAGE DESPECKLING METHOD USING INDEPENDENT COMPONENT ANALYSIS**
Di Lai, Navalgund Rao, Rochester Institute of Technology, United States; Chung-hui Kuo, Eastman Kodak Company, United States; Shweta Bhatt, Vikram Dogra, University of Rochester, United States

TP.PF.2 **OPTIMIZING NON-LOCAL MEANS FOR DENOISING LOW DOSE CT**
Zachary Kelm, Daniel Blezek, Brian Bartholmai, Bradley Erickson, Mayo Clinic, United States

TP.PF.3 **AN ADAPTIVE NONPARAMETRIC APPROACH TO RESTORATION AND INTERPOLATION FOR MEDICAL IMAGING**
Hiroyuki Takeda, Peyman Milanfar, University of California, Santa Cruz, United States

TP.PG: Tuesday, June 30, 08:00 - 09:15

TP.PG **Shape Modeling P1** (Poster)
Time: Tuesday, June 30, 08:00 - 09:15
Place: Plaza Ballroom Area G
Chair: Yongang Shi, UCLA School of Medicine

TP.PG.1 **VENTRICULAR WALL THICKNESS ANALYSIS IN ACUTE MYOCARDIAL INFARCTION AND HYPERTROPHIC CARDIOMYOPATHY**
Hui Sun, University of Pennsylvania, United States; Catalina Tobon-Gomez, University Pompeu Fabra, Spain; Sandhitsu Das, University of Pennsylvania, United States; Marina Huguet, CETIR Sant Jordi, Spain; Paul Yushkevich, University of Pennsylvania, United States; Alejandro Frangi, University Pompeu Fabra, Spain

TP.PG.2 **SPHERICAL REPRESENTATIONS OF SHAPE USING PARAMETRIZATIONS WITH MINIMAL DISTORTION**
Yue Qiu, Ying Wang, Xiuwen Liu, Washington Mio, Florida State University, United States

TP.PG.3 **A STATISTICAL DESCRIPTION OF THE ARTICULATING ULNA SURFACE FOR PROSTHESIS DESIGN**
Martijn Van de Giessen, Delft University of Technology, Netherlands; Nienke Smitsman, Simon D. Strackee, Academic Medical Center, Netherlands; Lucas J. van Vliet, Delft University of Technology, Netherlands; Kees A. Grimbergen, Geert J. Streekstra, Academic Medical Center, Netherlands; Frans M. Vos, Delft University of Technology, Netherlands

TP.PG.4 **ANATOMICAL VARIABILITY OF ORGANS VIA PRINCIPAL FACTOR ANALYSIS FROM THE CONSTRUCTION OF AN ABDOMINAL PROBABILISTIC ATLAS**
Mauricio Reyes, University of Bern, Switzerland; Miguel Á González Ballester, AlmaIT, Spain; Zhixi Li, National Institutes of Health, United States; Nina Kozic, University of Bern, Switzerland; See Chin, Ronald M. Summers, Marius George Linguraru, National Institutes of Health, United States

TP.PG.5 **IMPROVING THE RELIABILITY OF SHAPE COMPARISON BY PERTURBATION**
Yifeng Jiang, Erin Edmiston, Fei Wang, Hilary Blumberg, Xenophon Papademetris, Lawrence Staib, Yale University, United States

TP.PG.6 **INSTANCE-BASED GENERATIVE BIOLOGICAL SHAPE MODELING**
Tao Peng, Wei Wang, Gustavo K. Rohde, Robert F. Murphy, Carnegie Mellon University, United States

TP.PG.7 **LAPLACE-BELTRAMI NODAL COUNTS: A NEW SIGNATURE FOR 3D SHAPE ANALYSIS**
Rongjie Lai, Yonggang Shi, Ivo Dinov, Tony F. Chan, Arthur W. Toga, University of California, Los Angeles, United States

TP.PG.8 **LV SURFACE RECONSTRUCTION FROM SPARSE TMRI USING LAPLACIAN SURFACE DEFORMATION AND OPTIMIZATION**
Shaoting Zhang, Xiaoxu Wang, Dimitris Metaxas, Rutgers University, United States; Ting Chen, Leon Axel, New York University, United States

TO1.R1: Tuesday, June 30, 10:45 - 12:05

TO1.R1 **fMRI** (Lecture)
Time: Tuesday, June 30, 10:45 - 12:05
Place: Georgian
Chair: Vince Calhoun, University of New Mexico

10:45 - 11:05
TO1.R1.1 **PERFORMANCE EVALUATION OF ACCELERATED FUNCTIONAL MRI ACQUISITION USING COMPRESSED SENSING**
Hong Jung, Jong Chul Ye, Korea Advanced Institute of Science & Technology (KAIST), Republic of Korea

11:05 - 11:25
TO1.R1.2 **EXPLOITING MR VENOGRAPHY SEGMENTATION FOR THE ACCURATE MODEL ESTIMATION OF BOLD SIGNAL**
Zhenghui Hu, Xin Fang, Xiaoyan Shen, Zhejiang University, China; Pengcheng Shi, Rochester Institute of Technology, United States

11:25 - 11:45
TO1.R1.3 **SUSCEPTIBILITY, ECHO TIME SHIFTS, AND T2* CONSIDERATIONS FOR FUNCTIONAL MAGNETIC RESONANCE IMAGING**
Bradley Sutton, Yue Zhuo, University of Illinois at Urbana-Champaign, United States

11:45 - 12:05
TO1.R1.4 **FMRI ANALYSIS THROUGH BAYESIAN VARIABLE SELECTION WITH A SPATIAL PRIOR**
Jing Xia, Feng Liang, Yongmei Michelle Wang, University of Illinois at Urbana-Champaign, United States

TO1.R2 **Registration III** (Lecture)
Time: Tuesday, June 30, 10:45 - 12:05
Place: Arlington
Chair: Simon Warfield, Children's Hospital Boston/Harvard Medical School

10:45 - 11:05
TO1.R2.1 **TEMPLATE REGISTRATION WITH MISSING PARTS: APPLICATION TO THE SEGMENTATION OF M. TUBERCULOSIS INFECTED LUNGS**
Camille Vidal, Joshua Hewitt, Johns Hopkins University, United States; Stephanie Davis, Johns Hopkins University School of Medicine, United States; Laurent Younes, Johns Hopkins University, United States; Sanjay Jain, Johns Hopkins University School of Medicine, United States; Bruno Jedynak, Johns Hopkins University, United States

11:05 - 11:25
TO1.R2.2 **A PERIODIC OPTICAL FLOW MODEL FOR CARDIAC GATED IMAGES**
Ling Li, Xiaofeng Niu, Yongyi Yang, Illinois Institute of Technology, United States

11:25 - 11:45
TO1.R2.3 **DETECTING REGISTRATION FAILURE**
Sharmishtaa Seshamani, Rajesh Kumar, Purnima Rajan, Srdan Bejakovic, Gerard Mullin, Johns Hopkins University, United States; Themos Dassopoulos, Washington University, United States; Gregory Hager, Johns Hopkins University, United States

11:45 - 12:05
TO1.R2.4 **DEMONS ALGORITHMS FOR FLUID AND CURVATURE REGISTRATION**
Nathan Cahill, Carestream Health, Inc., United States; J. Alison Noble, University of Oxford, United Kingdom; David J. Hawkes, University College London, United Kingdom

TO1.R3: Tuesday, June 30, 10:45 - 12:05

TO1.R3 **Spatio-Temporal Microscopy Processing** (Lecture)
Time: Tuesday, June 30, 10:45 - 12:05
Place: Berkeley/Clarendon
Chair: Elsa Angelini, TELECOM Paris Tech

10:45 - 11:05
TO1.R3.1 **CONDITIONAL RANDOM FIELDS FOR OBJECT AND BACKGROUND ESTIMATION IN FLUORESCENCE VIDEO-MICROSCOPY**
Thierry Pecot, INRIA/INRA/Institut Curie, France; Anatole Chessel, INRIA/Institut Curie, France; Sabine Bardin, Jean Salamero, Institut Curie/CNRS, France; Patrick Bouthemy, INRIA, France; Charles Kervrann, INRA/INRIA, France

11:05 - 11:25
TO1.R3.2 **MOTION-BASED ENHANCEMENT OF OPTICAL IMAGING**
Mickael Savinaud, Nikos Paragios, INRIA Saclay Ile de France, France; Serge Maitrejean, Biospace Lab, France

11:25 - 11:45
TO1.R3.3 **IMAGE ANALYSIS OF ARABIDOPSIS TRICHOME PATTERNING IN 4D CONFOCAL DATASETS**
Robert Bensch, Olaf Ronneberger, Bettina Greese, Christian Fleck, University of Freiburg, Germany; Katja Wester, Martin Hülskamp, University of Köln, Germany; Hans Burkhardt, University of Freiburg, Germany

11:45 - 12:05
TO1.R3.4 **CARDIAC TISSUE AND ERYTHROCYTE SEPARATION IN BRIGHT-FIELD MICROSCOPY IMAGES OF THE EMBRYONIC ZEBRAFISH HEART FOR MOTION ESTIMATION**
Sandeep Bhat, Michael Liebling, University of California, Santa Barbara, United States

TO1.R4 **Technological Advances in Ultrasound Contrast Agents** (Special Session)
Time: Tuesday, June 30, 10:45 - 12:05
Place: Stanbro
Chair: David Kaeli, Northeastern University

10:45 - 11:05
TO1.R4.1 **TARGETED DRUG DELIVERY IN THE BRAIN VIA ULTRASOUND-INDUCED BLOOD-BRAIN BARRIER DISRUPTION**
Nathan McDannold, Brigham & Women's Hospital, Harvard Medical School, United States; Lisa Treat, Brigham & Women's Hospital, Harvard Medical School / Massachusetts Institute of Technology, United States; Natalia Vykhodtseva, Brigham & Women's Hospital, Harvard Medical School, United States; Kullervo Hynynen, University of Toronto, Sunnybrook Health Sciences Centre, Canada

11:05 - 11:25
TO1.R4.2 **IMPROVING TECHNOLOGY FOR MOLECULAR IMAGING WITH ULTRASOUND**
Paul A. Dayton, University of North Carolina-North Carolina State University, United States

11:25 - 11:45
TO1.R4.3 **FDA PERSPECTIVE ON ULTRASOUND CONTRAST AGENTS SAFETY AND DEVELOPMENT**
Ira Krefting, U.S. Food and Drug Administration, United States

11:45 - 12:05
TO1.R4.4 **ECHOGENIC LIPSOMES FOR TARGETED DRUG DELIVERY**
Christy K. Holland, University of Cincinnati, United States; David D. McPherson, University of Texas Health Science Center, United States

TO2.R1: Tuesday, June 30, 13:30 - 14:50

TO2.R1 **Molecular Imaging** (Lecture)
Time: Tuesday, June 30, 13:30 - 14:50
Place: Georgian
Chair: Vasilis Ntziachristos, Technical University of Munich

13:30 - 13:50
TO2.R1.1 **METALLIC NANOPARTICLES FOR BIOMEDICAL IMAGING**
Yogesh Patel, Sucharita Saha, Charles DiMarzio, Donald O'Malley, Dattatri Nagesha, Srinivas Sridhar, Northeastern University, United States

13:50 - 14:10
TO2.R1.2 **NUMERICAL INVESTGATION OF THE LASER HEATING OF GOLD NANOPARTICLES INCLUDING THERMAL AND DIELECTRIC CHANGES IN THE LOCAL MEDIUM**
Elisabetta Sassaroli, Brian O'Neill, King Li, The Methodist Hospital Research Institute, United States

14:10 - 14:30
TO2.R1.3 **DIFFUSED OPTICAL TOMOGRAPHY USING OXYGEN-SENSITIVE LUMINESCENT CONTRAST AGENT**
Rajan Gurjar, Madhavi Seetamraju, Noah Kolodziejski, Radiation Monitoring Devices, Inc., United States; Koo Yong-Eun, University of Michigan, United States; Anand T. N. Kumar, Massachusetts General Hospital and Harvard Medical School, United States; Raoul Kopelman, University of Michigan, United States

14:30 - 14:50
TO2.R1.4 **MOLECULAR IMAGING THROUGH THE BLOOD-BRAIN BARRIER: SAFETY ASSESSMENT AND PARAMETER DEPENDENCE**
Elisa Konofagou, James Choi, Ann Lee, Babak Baseri, Columbia University, United States

TO2.R2: Tuesday, June 30, 13:30 - 14:50

TO2.R2 **Segmentation in Ultrasound** (Lecture)
Time: Tuesday, June 30, 13:30 - 14:50
Place: Arlington
Chair: Elisa Konofagu, Biomedical Engineering, Columbia University

13:30 - 13:50
TO2.R2.1 **SEGMENTING RODENT CARDIAC ULTRASOUND IMAGES USING DIRECT POSTERIOR MODELS**
Yong Yue, Hemant Tagare, Yale University, United States

13:50 - 14:10
TO2.R2.2 **MITRAL ANNULUS SEGMENTATION FROM THREE-DIMENSIONAL ULTRASOUND**
Robert Schneider, Harvard University, United States; Douglas Perrin, Nikolay Vasilyev, Gerald Marx, Pedro del Nido, Children's Hospital Boston, United States; Robert Howe, Harvard University, United States

14:10 - 14:30
TO2.R2.3 **LOCAL-PHASE BASED 3D BOUNDARY DETECTION USING MONOGENIC SIGNAL AND ITS APPLICATION TO REAL-TIME 3-D ECHOCARDIOGRAPHY IMAGES**
Kashif Rajpoot, Vicente Grau, J. Alison Noble, University of Oxford, United Kingdom

14:30 - 14:50
TO2.R2.4 **A NEW METHOD FOR CHARACTERIZATION OF CORONARY PLAQUE COMPOSITION VIA IVUS IMAGES**
Arash Taki, Technical University of Munich (TUM), Germany; Alireza Roodaki, Supelec, Iran; Olivier Pauly, Technical University of Munich (TUM), Germany; S.Kamaledin Setarehdan, University of Tehran, Iran; Gozde Unal, Sabanci University, Turkey; Nassir Navab, Technical University of Munich, Germany

TO2.R3: Tuesday, June 30, 13:30 - 14:50

TO2.R3 **Microscopy Image Processing** (Lecture)
Time: Tuesday, June 30, 13:30 - 14:50
Place: Berkeley/Clarendon
Chair: Boudewijn Lelieveldt, Leiden University Medical Center

13:30 - 13:50
TO2.R3.1 **MORPHOMETRIC SUBTYPING FOR A PANEL OF BREAST CANCER CELL LINES**
Ju Han, Hang Chang, Gerald Fontenay, Nicholas J. Wang, Joe W. Gray, Bahram Parvin, Lawrence Berkeley National Laboratory, United States

13:50 - 14:10
TO2.R3.2 **AUTOMATED CELL COUNTING AND CLUSTER SEGMENTATION USING CONCAVITY DETECTION AND ELLIPSE FITTING TECHNIQUES**
Sonal Kothari, Qaiser Chaudry, May Wang, Georgia Institute of Technology, United States

14:10 - 14:30
TO2.R3.3 **AUTOMATIC EMBRYONIC STEM CELLS DETECTION AND COUNTING METHOD IN FLUORESCENCE MICROSCOPY IMAGES**
Geisa Faustino, Marcelo Gattass, PUC-Rio, Brazil; Stevens Rehen, UFRJ, Brazil; Carlos Lucena, PUC-Rio, Brazil

14:30 - 14:50
TO2.R3.4 **IMAGE RECONSTRUCTION OF MULTIPHOTON MICROSCOPY DATA**
Jared Doot, Kevin Eliceiri, Robert Nowak, University of Wisconsin, United States; Rebecca Willett, Duke University, United States

TO2.R4 **DTI I** (Lecture)
Time: Tuesday, June 30, 13:30 - 14:50
Place: Stanbro
Chair: Baba Vemuri, University of Florida

13:30 - 13:50
TO2.R4.1 **VOXEL-WISE GROUP ANALYSIS OF DTI**
Zhexing Liu, Hongtu Zhu, Bonita Marks, Laurence Katz, University of North Carolina at Chapel Hill, United States; Casey Goodlett, Guido Gerig, University of Utah, United States; Martin Styner, University of North Carolina at Chapel Hill, United States

13:50 - 14:10
TO2.R4.2 **GENERALIZED LIKELIHOOD RATIO TESTS FOR CHANGE DETECTION IN DIFFUSION TENSOR IMAGES**
Hervé Boisgontier, Vincent Noblet, Fabrice Heitz, LSIIT, UMR UdS-CNRS 7005, France; Lucien Rumbach, CHU Minjoz, France; Jean-Paul Armspach, LINC, UMR UdS-CNRS 7191, France

14:10 - 14:30
TO2.R4.3 **BAYESIAN FRAMEWORK FOR WHITE MATTER FIBER SIMILARITY MEASURE**
Demian Wassermann, INRIA - Mediterranée, France; Luke Bloy, Ragini Verma, University of Pennsylvania School of Medicine, United States; Rachid Deriche, INRIA - Mediterranée, France

14:30 - 14:50
TO2.R4.4 **REDUCING STRUCTURAL VARIATION TO DETERMINE THE GENETICS OF WHITE MATTER INTEGRITY ACROSS HEMISPHERES – A DTI STUDY OF 100 TWINS**
Neda Jahanshad, Agatha Lee, Natasha Lepore, Yi-Yu Chou, Caroline Brun, Marina Barysheva, Arthur W. Toga, University of California, Los Angeles, United States; Katie L. McMahon, Greig I. de Zubicaray, University of Queensland, fMRI Laboratory, Centre for Magnetic Resonance, Australia; Margaret J. Wright, Queensland Institute of Medical Research, Australia; Guillermo Sapiro, Christophe Lenglet, University of Minnesota, United States; Paul M. Thompson, University of California, Los Angeles, United States

TO3.R1: Tuesday, June 30, 15:00 - 16:20

TO3.R1 **Statistical Methods in Neuroimage Analysis**
(Special Session)
Time: Tuesday, June 30, 15:00 - 16:20
Place: Georgian
Co-Chairs: Lawrence Staib, Yale University and Y. Michelle Wang, University of Illinois

15:00 - 15:20
TO3.R1.1 **THE ROLE AND DEVELOPMENT OF TECHNOLOGY TO ADVANCE BRAIN SCIENCE**
Nick Lange, Harvard Medical School, United States

15:20 - 15:40
TO3.R1.2 **AN ICA FRAMEWORK FOR INTEGRATING FMRI, ERP AND GENETIC DATA**
Vince Calhoun, MIND/UNM, United States

15:40 - 16:00
TO3.R1.3 **IMAGE-DRIVEN POPULATION ANALYSIS THROUGH MIXTURE MODELING**
Mert Sabuncu, Massachusetts Institute of Technology, United States

16:00 - 16:20
TO3.R1.4 **MORPHOLOGICAL APPEARANCE MANIFOLDS IN COMPUTATIONAL ANATOMY: GROUPWISE REGISTRATION AND MORPHOLOGICAL ANALYSIS**
Christos Davatzikos, Naixiang Lian, University of Pennsylvania, United States

TO3.R2: Tuesday, June 30, 15:00 - 16:20

TO3.R2 **Segmentation in Cardiovascular MR and CT**
(Lecture)
Time: Tuesday, June 30, 15:00 - 16:20
Place: Arlington
Chair: Scott Acton, University of Virginia

15:00 - 15:20
TO3.R2.1 **FULLY AUTOMATED SEGMENTATION OF LONG-AXIS MRI STRAIN-ENCODED(SENC) IMAGES USING ACTIVE SHAPE MODEL(ASM)**
Ahmed Harouni, Johns Hopkins University, United States; David Bluemke, National Institutes of Health, United States; Nael Osman, Johns Hopkins University, United States

15:20 - 15:40
TO3.R2.2 **A DATA-DRIVEN APPROACH TO PRIOR EXTRACTION FOR SEGMENTATION OF LEFT VENTRICLE IN CARDIAC MR IMAGES**
Xiao Jia, Chao Li, Ying Sun, Ashraf A. Kassim, National University of Singapore, Singapore; Yijen L. Wu, T. Kevin Hitchens, Chien Ho, Carnegie Mellon University, United States

15:40 - 16:00
TO3.R2.3 **CAROTID ARTERY SEGMENTATION AND PLAQUE QUANTIFICATION IN CTA**
Danijela Vukadinovic, Theo van Walsum, Sietske Rozie, Thomas de Weert, Rashindra Manniesing, Erasmus MC, University Medical Center Rotterdam, Netherlands; Aad van der Lugt, Delft University of Technology, Netherlands; Wiro Niessen, Erasmus MC, University Medical Center Rotterdam / Delft University of Technology, Netherlands

16:00 - 16:20
TO3.R2.4 **ESTIMATION OF MULTIMODAL ORIENTATION DISTRIBUTION FUNCTIONS FROM CARDIAC MRI FOR TRACKING PURKINJE FIBERS THROUGH BRANCHINGS**
Hasan Ertan Cetingul, Johns Hopkins University, United States; Gernot Plank, Medical University Graz, Austria; Natalia Trayanova, Rene Vidal, Johns Hopkins University, United States

TO3.R3: Tuesday, June 30, 15:00 - 16:20

TO3.R3 **CAD for Imaging of Cancer** (Lecture)
Time: Tuesday, June 30, 15:00 - 16:20
Place: Berkeley/Clarendon
Chair: Nico Karssemeijer, Radboud University Nijmegen Medical Centre

15:00 - 15:20
TO3.R3.1 **A GENERAL FRAMEWORK FOR AUTOMATIC DETECTION OF MATCHING LESIONS IN FOLLOW-UP CT**
Jan Hendrik Moltz, Michael Schwier, Heinz-Otto Peitgen, Fraunhofer MEVIS - Institute for Medical Image Computing, Germany

15:20 - 15:40
TO3.R3.2 **FAST DETECTION OF CONVERGENCE AREAS IN DIGITAL BREAST TOMOSYNTHESIS**
Giovanni Palma, Serge Muller, General Electric Healthcare, France; Isabelle Bloch, TELECOM ParisTech (ENST) - CNRS UMR 5141, France; Razvan Iordache, General Electric Healthcare, France

15:40 - 16:00
TO3.R3.3 **COMPUTER-AIDED PROGNOSIS OF ER+ BREAST CANCER HISTOPATHOLOGY AND CORRELATING SURVIVAL OUTCOME WITH ONCOTYPE DX ASSAY**
Ajay Basavanhally, Jun Xu, Rutgers University, United States; Shridar Ganesan, The Cancer Institute of New Jersey, United States; Anant Madabhushi, Rutgers University, United States

16:00 - 16:20
TO3.R3.4 **SEMI-AUTOMATED MEASUREMENT OF PULMONARY NODULE GROWTH WITHOUT EXPLICIT SEGMENTATION**
Artit Jirapatnakul, Anthony P. Reeves, Alberto M. Biancardi, Cornell University, United States; David F. Yankelevitz, Claudia Henschke, Weill Cornell Medical College, United States

TO3.R4: Tuesday, June 30, 15:00 - 16:20

TO3.R4 **Reconstruction for Dynamic Imaging** (Lecture)
Time: Tuesday, June 30, 15:00 - 16:20
Place: Stanbro
Chair: Yesim Serinagaoglu, Middle East Technical University

15:00 - 15:20
TO3.R4.1 **TIME-RESOLVED CARDIAC CT RECONSTRUCTION USING A NONLINEAR KALMAN-FILTER-BASED ALGORITHM**
Ashvin George, Andrew Arai, National Institutes of Health, United States; Elliot R. McVeigh, Johns Hopkins University, United States

15:20 - 15:40
TO3.R4.2 **SPATIAL RESOLUTION AND NOISE PROPERTIES OF REGULARIZED MOTION-COMPENSATED IMAGE RECONSTRUCTION**
Se Young Chun, Jeffrey A. Fessler, University of Michigan, United States

15:40 - 16:00
TO3.R4.3 **DIRECT RECONSTRUCTION OF DYNAMIC PET PARAMETRIC IMAGES USING SPARSE SPECTRAL REPRESENTATION**
Guobao Wang, Jinyi Qi, University of California, Davis, United States

16:00 - 16:20
TO3.R4.4 **DYNAMIC PET RECONSTRUCTION ALGORITHMS USING EMPIRICAL MODE DECOMPOSITION REGULARISATION**
Andrew McLennan, Michael Brady, University of Oxford, United Kingdom

TO4.R1: Tuesday, June 30, 16:40 - 18:00

TO4.R1 **Shape Modeling** (Lecture)
Time: Tuesday, June 30, 16:40 - 18:00
Place: Georgian
Chair: Ross Whitaker, SCI Institute, School of Computing, University of Utah

16:40 - 17:00
TO4.R1.1 **A SHAPE-NAVIGATED IMAGE DEFORMATION MODEL FOR 4D LUNG RESPIRATORY MOTION ESTIMATION**
Xiaoxiao Liu, Rohit R. Saboo, Stephen M. Pizer, University of North Carolina at Chapel Hill, United States; Gig S. Mageras, Memorial Sloan-Kettering Cancer Center, United States

17:00 - 17:20
TO4.R1.2 **MAPPING HIPPOCAMPAL ATROPHY WITH A MULTI-SCALE MODEL OF SHAPE**
Xinyang Liu, Florida State University, United States; Yonggang Shi, Jonathan Morra, University of California, Los Angeles, United States; Xiuwen Liu, Florida State University, United States; Paul M. Thompson, University of California, Los Angeles, United States; Washington Mio, Florida State University, United States

17:20 - 17:40
TO4.R1.3 **POPULATION-SPECIFIC EVALUATION OF IMPLANT BONE FITTING USING PCA SHAPE SPACE AND LEVEL SETS**
Nina Kozic, ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland; Miguel Á González Ballester, Alma IT Systems, Spain; Philippe Büchler, ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland; Nils Reimers, Stryker Trauma GmbH, Germany; Lutz P. Nolte, ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland; Marius George Linguraru, National Institutes of Health, United States; Mauricio Reyes, ARTORG Center for Biomedical Engineering Research, University of Bern, Switzerland

17:40 - 18:00
TO4.R1.4 **SPARSE REPRESENTATION OF DEFORMABLE 3D ORGANS**
Dan Wang, Ahmed Tewfik, University of Minnesota, United States

TO4.R2 **Cardiovascular Imaging** (Lecture)
Time: Tuesday, June 30, 16:40 - 18:00
Place: Arlington
Chair: Wiro Niessen, Erasmus MC - University Medical Center Rotterdam

16:40 - 17:00
TO4.R2.1 **A DIVERGENCE-FREE VECTOR FIELD MODEL FOR IMAGING APPLICATIONS**
Oskar Skrinjar, Arnaud Bistoquet, Georgia Institute of Technology, United States; John Oshinski, Emory University, United States; Kartik Sundareswaran, Georgia Institute of Technology, United States; David Frakes, Arizona State University, United States; Ajit Yoganathan, Georgia Institute of Technology, United States

17:00 - 17:20
TO4.R2.2 **QUANTITATIVE EVALUATION OF VIRTUAL ANGIOGRAPHY FOR INTERVENTIONAL X-RAY ACQUISITIONS**
Qi Sun, Alexandra Groth, Irina Waechter, Philips Research Europe, Germany; Olivier Brina, University Hospital of Geneva, Switzerland; Jürgen Weese, Philips Research Europe, Germany; Til Aach, Institute of Imaging and Computer Vision, RWTH Aachen University, Germany

17:20 - 17:40
TO4.R2.3 **CARDIAC MOTION ANALYSIS IN ISCHEMIC AND NON-ISCHEMIC CARDIOMYOPATHY USING PARALLEL TRANSPORT**
Siamak Ardekani, The Johns Hopkins University, United States; Robert G. Weiss, Albert C. Lardo, Richard T. George, Joao C. Lima, Katherine C. Wu, The Johns Hopkins University Medical Institution, United States; Michael I. Miller, Raimond L. Winslow, Laurent Younes, The Johns Hopkins University, United States

17:40 - 18:00
TO4.R2.4 **A TWO-LEVEL TRANSFER FUNCTION BASED METHOD FOR HEART DISPLAY WITH VASCULAR TISSUE AND SCAR ENHANCEMENT**
Qi Zhang, Roy Eagleson, Terry Peters, James White, Robarts Research Institute, University of Western Ontario, Canada

TO4.R3: Tuesday, June 30, 16:40 - 18:00

TO4.R3 **CAD for CT Colongraphy** (Lecture)
Time: Tuesday, June 30, 16:40 - 18:00
Place: Berkeley/Clarendon
Chair: Christian Roux, Institut TELECOM - TELECOM Bretagne

16:40 - 17:00
TO4.R3.1 **COMBINING MESH, VOLUME, AND STREAMLINE REPRESENTATIONS FOR POLYP DETECTION IN CT COLONOGRAPHY**
V. F. van Ravesteijn, L. Zhao, C. P. Botha, F. H. Post, Delft University of Technology, Netherlands; Frans M. Vos, Delft University of Technology / Academic Medical Center Amsterdam, Netherlands; Lucas J. van Vliet, Delft University of Technology, Netherlands

17:00 - 17:20
TO4.R3.2 **COMPUTER-AIDED DETECTION OF COLORECTAL LESIONS FOR CATHARTIC-FREE CT COLONOGRAPHY**
Janne Näppi, Wenli Cai, Hiroyuki Yoshida, Massachusetts General Hospital and Harvard Medical School, United States

17:20 - 17:40
TO4.R3.3 **REDUCING THE FALSE POSITIVE RATE OF COMPUTER AIDED DETECTION FOR CT COLONOGRAPHY USING CONTENT BASED IMAGE RETRIEVAL**
Javed Aman, Jianhua Yao, Ronald M. Summers, National Institutes of Health, United States

17:40 - 18:00
TO4.R3.4 **COMPUTER-AIDED DETECTION OF POLYPS IN CT COLONOGRAPHY: PERFORMANCE EVALUATION IN COMPARISON WITH HUMAN READERS BASED ON LARGE MULTICENTER CLINICAL TRIAL CASES**
Hiroyuki Yoshida, Janne Näppi, Wenli Cai, Massachusetts General Hospital, United States

TO4.R4: Tuesday, June 30, 16:40 - 18:00

TO4.R4 **PET/SPECT II** (Lecture)
Time: Tuesday, June 30, 16:40 - 18:00
Place: Stanbro
Chair: Jinyi Qi, University of California, Davis

16:40 - 17:00
TO4.R4.1 **DETECTABILITY OF PERFUSION DEFECT IN GATED DYNAMIC CARDIAC SPECT IMAGES**
Xiaofeng Niu, Yongyi Yang, Miles N. Wernick, Illinois Institute of Technology, United States

17:00 - 17:20
TO4.R4.2 **AN IMPROVED UNBIASED METHOD FOR DIFFSPECT QUANTIFICATION IN EPILEPSY**
Dustin Scheinost, Hal Blumenfeld, Xenophon Papademetris, Yale University, United States

17:20 - 17:40
TO4.R4.3 **INCORPORATION OF RESPIRATORY MOTION ESTIMATION WITHIN A MAP SUPER-RESOLUTION ALGORITHM FOR IMAGE ENHANCEMENT IN 4D PET**
Daphné Wallach, INSERM U650, France; Frédéric Lamare, MRCCSC, United Kingdom; Christian Roux, Institut TELECOM - TELECOM Bretagne, France; Dimitris Visvikis, INSERM U650, France

17:40 - 18:00
TO4.R4.4 **A FEASIBILITY STUDY OF JOINT RESPIRATORY AND CARDIAC MOTION CORRECTION FOR CORONARY PET/CT IMAGING**
Sonal Ambwani, Boston University, United States; Sanghee Cho, Massachusetts General Hospital, United States; W. Clem Karl, Boston University, United States; Ahmed Tawakol, Homer Pien, Massachusetts General Hospital, United States

WP.PA **Registration P1** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area A
Chair: Boudewijn Lelieveldt, Leiden University Medical Center

WP.PA.2 **POLYNOMIAL INTENSITY CORRECTION FOR MULTIMODAL IMAGE REGISTRATION**
Wanmei Ou, Massachusetts Institute of Technology, United States; Christophe Chefd'Hotel, Siemens Corporate Research, United States

WP.PA.3 **REGISTRATION OF CONTOURS OF BRAIN STRUCTURES THROUGH A HEAT-KERNEL REPRESENTATION OF SHAPE**
Jonathan Bates, Ying Wang, Xiuwen Liu, Washington Mio, Florida State University, United States

WP.PA.4 **OPTIMAL DISCRETE MULTI-RESOLUTION DEFORMABLE IMAGE REGISTRATION**
Marijn van Stralen, Josien P. W. Pluim, Image Sciences Institute, Netherlands

WP.PA.5 **IMAGE REGISTRATION USING UNCERTAINTY COEFFICIENTS**
Andrew Melbourne, David J. Hawkes, David Atkinson, University College London, United Kingdom

WP.PA.6 **CENTERLINE REGISTRATION OF PRONE AND SUPINE CT COLONOGRAPHY SCANS BASED ON CORRELATION OPTIMIZED WARPING AND ANATOMICAL LANDMARKS**
Shijun Wang, Jianhua Yao, Jiamin Liu, National Institutes of Health, United States; Nicholas Petrick, U.S. Food and Drug Administration, United States; Ronald M. Summers, National Institutes of Health, United States

WP.PA.7 **GPU ACCELERATED ALIGNMENT OF 3-D CTA WITH 2-D X-RAY DATA FOR IMPROVED GUIDANCE IN CORONARY INTERVENTIONS**
C. T. Metz, M. Schaap, Stefan Klein, A. C. Weustink, N. R. Mollet, C. Schultz, R. J. van geuns, P. W. Serruys, Theo van Walsum, W. J. Niessen, Erasmus MC, Netherlands

WP.PA.8 **MRI MODALITIY TRANSFORMATION IN DEMON REGISTRATION**
Dirk-Jan Kroon, Kees Slump, University of Twente, Netherlands

WP.PA.9 **ULTRASOUND AND CT REGISTRATION QUALITY: ELASTOGRAPHY VS. CLASSICAL B-MODE**
Matthias Keil, Fraunhofer IGD, Germany; Philipp J. Stolka, Johns Hopkins University, United States; Marion Wiebel, Technische Universität Darmstadt, Germany; Georgios Sakas, Fraunhofer IGD, Germany; Elliot R. McVeigh, Russell H. Taylor, Johns Hopkins University, Germany; Emad Boctor, Johns Hopkins Medical Institutions, United States

WP.PA.10 AUTOMATIC ALIGNMENT OF STACKS OF FILAMENT DATA
Vincent J. Dercksen, Britta Weber, David Günther, Zuse Institute Berlin, Germany; Marcel Oberlaender, Max Planck Institute of Neurobiology, Germany; Steffen Prohaska, Hans-Christian Hege, Zuse Institute Berlin, Germany

WP.PA.11 A LAGRANGIAN FORMULATION FOR STATISTICAL FLUID REGISTRATION
Caroline Brun, Natasha Lepore, University of California, Los Angeles, United States; Xavier Pennec, Asclepios Research Project, INRIA, France; Yi-Yu Chou, Agatha Lee, Marina Barysheva, University of California, Los Angeles, United States; Greig I. de Zubicaray, Centre for Magnetic Resonance, Australia; Katie L. McMahon, MRI Cardiac and Research Centre, Australia; Margaret J. Wright, Genetic Epidemiology Lab, Australia; Arthur W. Toga, Paul M. Thompson, University of California, Los Angeles, United States

WP.PA.12 A NEW CONSISTENT IMAGE REGISTRATION FORMULATION WITH A B-SPLINE DEFORMATION MODEL
Wei Feng, Stanley Reeves, Thomas Denney, Jr., Auburn University, United States; Steven Lloyd, Louis Dell'Italia, Himanshu Gupta, University of Alabama at Birmingham, United States

WP.PA.13 LOCALLY CONSTRAINED CUBIC B-SPLINE DEFORMATIONS TO CONTROL VOLUME VARIATIONS
Julien Dauguet, Anne-Sophie Hérard, CEA-CNRS, France; Jérôme Declerck, Siemens Molecular Imaging, United Kingdom; Thierry Delzescaux, CEA-CNRS, France

WP.PA.14 2D/3D REGISTRATION OF MICRO-CT DATA TO MULTI-VIEW PHOTOGRAPHS BASED ON A 3D DISTANCE MAP
Martin Wildeman, Technical University Delft, Leiden University Medical Center, Netherlands; Martin Baiker, Johan Reiber, Clemens Loewik, Leiden University Medical Center, Netherlands; Marcel Reinders, Technical University Delft, Netherlands; Boudewijn Lelieveldt, Leiden University Medical Center, Netherlands

WP.PA.15 MRI-ULTRASOUND REGISTRATION FOR TARGETED PROSTATE BIOPSY
Ramkrishnan Narayanan, Eigen Inc., United States; John Kurhanewicz, Katsuto Shinohara, University of California, San Francisco, United States; David Crawford, University of Colorado, Denver, United States; Anne Simoneau, University of California, Irvine, United States; Jasjit Suri, Eigen Inc., United States

WP.PA.16 LEARNING A TISSUE INVARIANT ULTRASOUND SPECKLE DECORRELATION MODEL
Catherine Laporte, Tal Arbel, McGill University, Canada

WP.PB **Classification P1** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area B
Chair: Evangelia I. Zacharaki, University of Patras

WP.PB.1 **COMPUTATIONAL ANALYSIS OF HRCT IMAGES FOR CHARACTERIZATION AND DIFFERENTIATION OF ILD AND COPD**
Gang Song, University of Pennsylvania, United States; Eduardo Barbosa Jr, University of Pennsylvania Medical Center, United States; Nicholas Tustison, James C. Gee, University of Pennsylvania, United States; Warren Gefter, Kreider Maryl, Drew Torigian, University of Pennsylvania Medical Center, United States

WP.PB.2 **EEG CLASSIFICATION BY ICA SOURCE SELECTION OF LAPLACIAN-FILTERED DATA**
Claudio Carvalhaes, Marcos Perreau-Guimaraes, Logan Grosenick, Patrick Suppes, Stanford University, United States

WP.PB.3 **DETECTION OF TUBERCULOSIS IN SPUTUM SMEAR IMAGES USING TWO ONE-CLASS CLASSIFIERS**
Rethabile Khutlang, Sriram Krishnan, University of Cape Town, South Africa; Andrew Whitelaw, Groote Schuur Hospital, South Africa; Tania Douglas, University of Cape Town, South Africa

WP.PB.4 **TEXTURE BASED CLASSIFICATION OF HYPERSPECRTAL COLON BIOPSY SAMPLES USING CLBP**
Khalid Masood, Nasir Rajpoot, University of Warwick, United Kingdom

WP.PB.5 **CLASSIFICATION OF DUCTAL TREE STRUCTURES IN GALACTOGRAMS**
Angeliki Skoura, University of Patras, Greece; Michael Barnathan, Temple University, United States; Vasileios Megalooikonomou, University of Patras, Greece

WP.PB.6 **ONLINE THREE-DIMENSIONAL DENDRITIC SPINES MOPHOLOGICAL CLASSIFICATION BASED ON SEMI-SUPERVISED LEARNING**
Peng Shi, Xiaobo Zhou, Center for Biotechnology and Informatics, The Methodist Hospital Research Institute, and Department of Radiology, The Methodist Hospital, Weill Cornell Medical College, United States; Qing Li, University of Houston, United States; Matthew Baron, Merille A. Teylan, Yong Kim, Laboratory of Molecular and Cellular Neuroscience, The Rockefeller University, United States; Stephen Wong, Center for Biotechnology and Informatics, The Methodist Hospital Research Institute, and Department of Radiology, The Methodist Hospital, Weill Cornell Medical College, United States

WP.PB.7 **AUTOMATED ANALYSIS OF HUMAN PROTEIN ATLAS IMMUNOFLUORESCENCE IMAGES**
Justin Newberg, Jieyue Li, Arvind Rao, Carnegie Mellon University, United States; Fredrik Ponten, Uppsala University, Sweden; Mathias Uhlen, Emma Lundberg, Royal Institute of Technology, Sweden; Robert F. Murphy, Carnegie Mellon University, United States

WP.PB.8 **QUANTITATIVE COMPARISON OF TWO CARDIAC ELECTROPHYSIOLOGY MODELS USING PERSONALISATION TO OPTICAL AND MR DATA**
Jatin Relan, Maxime Sermesant, Herve Delingette, Asclepios Research Project, INRIA, France; Mihaela Pop, Graham Wright, Sunnybrook Health Sciences Centre, University of Toronto, Canada; Nicholas Ayache, Asclepios Research Project, INRIA, France

WP.PB.9 **CLASSIFICATION OF SCAN LOCATION IN RETINAL OPTICAL COHERENCE TOMOGRAPHY**
Susanna Ricco, Duke University, United States; Mei Chen, Intel Research Pittsburgh, United States

WP.PB.10 **MRI-BASED CLASSIFICATION OF BRAIN TUMOR TYPE AND GRADE USING SVM-RFE**
Evangelia Zacharaki, Sumei Wang, Sanjeev Chawla, University of Pennsylvania, United States; Dong Soo Yoo, Dankook University College of Medicine, Republic of Korea; Ronald Wolf, Elias Melhem, Christos Davatzikos, University of Pennsylvania, United States

WP.PB.11 **AUTOMATIC MARKUP OF NEURAL CELL MEMBRANES USING BOOSTED DECISION STUMPS**
Kannan Umadevi Venkataraju, Antonio Paiva, Elizabeth Jurrus, Tolga Tasdizen, University of Utah, United States

WP.PC: Wednesday, July 1, 08:00 - 09:15

WP.PC **Image-Guided Surgery and Therapy** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area C
Chair: Stanley Reeves, Auburn University

WP.PC.1 **ROBUST VESSEL REGISTRATION AND TRACKING OF MICROSCOPE VIDEO IMAGES IN TUMOR RESECTION NEUROSURGERY**
Siyi Ding, Michael Miga, Reid Thompson, Benoit Dawant, Vanderbilt University, United States

WP.PC.2 **REDUCED-DIMENSIONALITY MATCHING FOR 3-D RECONSTRUCTION OF PROSTATE BRACHYTHERAPY IMPLANTS FROM INCOMPLETE DATA**
Junghoon Lee, Christian Labat, Johns Hopkins University, United States; Ameet Jain, Philips Research North America, United States; Gabor Fichtinger, Queen's University, Canada; Jerry L. Prince, Johns Hopkins University, United States

WP.PC.3 **AUTOMATED VOLUME SAMPLING OPTIMIZATION FOR DIRECT VOLUME DEFORMATION IN PATIENT-SPECIFIC SURGICAL SIMULATION**
Kei Wai Cecilia Hung, Megumi Nakao, Kotaro Minato, Nara Institute of Science and Technology, Japan

WP.PC.4 **A FRAMEWORK FOR CRANIOFACIAL SURGERY SIMULATION BASED ON PRE-SPECIFIED TARGET FACE CONFIGURATIONS**
Shengzheng Wang, Shanghai Jiao Tong University, China; James C. Gee, University of Pennsylvania, United States; Jie Yang, Shanghai Jiao Tong University, China

WP.PC.5 **AFFINE-INVARIANT ANISOTROPIC DETECTOR FOR SOFT TISSUE TRACKING IN MINIMALLY INVASIVE SURGERY**
Stamatia Giannarou, Marco Visentini-Scarzanella, Guang-Zhong Yang, Imperial College London, United Kingdom

WP.PC.6 **IMAGE CONSTRAINED FINITE ELEMENT MODELLING FOR REAL-TIME SURGICAL SIMULATION AND GUIDANCE**
Mirna Lerotic, Su-Lin Lee, Jennifer Keegan, Guang-Zhong Yang, Imperial College London, United Kingdom

WP.PC.7 **A NEW SCHEME FOR CURVED NEEDLE SEGMENTATION IN THREE-DIMENSIONAL ULTRASOUND IMAGES**
Mohammad Aboofazeli, Purang Abolmaesumi, Parvin Mousavi, Gabor Fichtinger, Queen's University, Canada

WP.PC.8 **VALIDATION OF AN AUTOMATIC CONTOUR PROPAGATION METHOD FOR LUNG CANCER 4D ADAPTIVE RADIATION THERAPY**
Marta Peroni, Politecnico di Milano University, Italy; Maria Francesca Spadea, Università degli Studi Magna Graecia, Italy; Marco Riboldi, Guido Baroni, Politecnico di Milano University, Italy; George T.Y. Chen, Gregory Charles Sharp, Massachusetts General Hospital, United States

WP.PC.9 **OPTIMIZATION OF 3-D IMAGE-GUIDED NEAR INFRARED SPECTROSCOPY USING BOUNDARY ELEMENT METHOD**
Subhadra Srinivasan, Colin Carpenter, Brian Pogue, Keith Paulsen, Dartmouth College, United States

WP.PC.10 **INTERACTIVE LEVEL SET SEGMENTATION FOR IMAGE-GUIDED THERAPY**
Nir Ben-Zadok, Tel-Aviv University, Israel; Tammy Riklin Raviv, Massachusetts Institute of Technology, United States; Nahum Kiryati, Tel-Aviv University, Israel

WP.PC.11 **INDIRECT CAMERA CALIBRATION FOR SURGERY TRACKING**
Bennet Tillapaugh, Andreas Savakis, Rochester Institute of Technology, United States

WP.PC.12 **A COMBINED SURFACE AND VOLUMETRIC APPROACH FOR REGISTRATION OF PATIENT SPECIFIC MODELS INTO LEFT ATRIAL CARDIAC ABLATION PROCEDURES**
Maryam Rettmann, David Holmes III, Charles Dalegrave, Christopher Stanton, Susan Johnson, Douglas Packer, Richard Robb, Mayo Clinic, United States

WP.PD: Wednesday, July 1, 08:00 - 09:15

WP.PD **Microscopy** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area D
Chair: Raimund Ober, University of Texas at Dallas

WP.PD.1 **BAYESIAN IMAGE ANALYSIS WITH ON-LINE CONFIDENCE ESTIMATES AND ITS APPLICATION TO MICROTUBULE TRACKING**
Janick Cardinale, Alexander Rauch, Yves Barral, Gabor Székely, Ivo F. Sbalzarini, ETH Zurich, Switzerland

WP.PD.2 **POINT-SPREAD FUNCTION RETRIEVAL FOR FLUORESCENCE MICROSCOPY**
Praveen Pankajakshan, Laure Blanc-Feraud, INRIA Universite de Nice Sophia Antipolis, France; Zvi Kam, Weizmann Institute of Science, Israel; Josiane Zerubia, INRIA Universite de Nice Sophia Antipolis, France

WP.PD.3 **EVALUATION OF IMAGE SEQUENCES ADDITIVE DECOMPOSITION ALGORITHMS FOR MEMBRANE ANALYSIS IN FLUORESCENCE VIDEO-MICROSCOPY**
Anatole Chessel, Thierry Pecot, INRIA Rennes/Institut Curie, France; Sabine Bardin, CNRS/Institut Curie, France; Charles Kervrann, INRIA Rennes/INRA, France; Jean Salamero, CNRS/Intitut curie, France

WP.PD.4 **STRUCTURAL ANNOTATION OF EM IMAGES BY GRAPH CUT**
Hang Chang, Manfred Auer, Bahram Parvin, Lawrence Berkeley National Laboratory, United States

WP.PD.5 **A METHOD FOR NORMALIZING HISTOLOGY SLIDES FOR QUANTITATIVE ANALYSIS**
Marc Macenko, Marc Niethammer, J. S. Marron, University of North Carolina at Chapel Hill, United States; David Borland, Renaissance Computing Institute, United States; John T. Woosley, University of North Carolina at Chapel Hill, United States; Xiaojun Guan, Charles Schmitt, Renaissance Computing Institute, United States; Nancy E. Thomas, University of North Carolina at Chapel Hill, United States

WP.PD.6 **MOVING BEYOND COLOR: THE CASE FOR MULTISPECTRAL IMAGING IN BRIGHTFIELD PATHOLOGY**
William Cukierski, Xin Qi, David Foran, UMDNJ-Robert Wood Johnson Medical School, United States

WP.PD.7 **A 3D RESOLUTION MEASURE FOR OPTICAL MICROSCOPY**
Jerry Chao, University of Texas at Dallas, United States; Sripad Ram, E. Sally Ward, University of Texas Southwestern Medical Center, United States; Raimund Ober, University of Texas at Dallas, United States

WP.PD.8 **3D SPATIAL DRIFT CORRECTION USING KALMAN FILTERING FOR FLUORESCENCE BASED IMAGING**
Thierry Dorval, Carolina Borsoi Moraes, Arnaud Ogier, Lucio Freitas Junior, Auguste Genovesio, Institut Pasteur Korea, Republic of Korea

WP.PD.9 **A FAST BAND SELECTION METHOD TO INCREASE IMAGE CONTRAST FOR MULTISPECTRAL IMAGE SEGMENTATION**
Xuqing Wu, Shishir Shah, University of Houston, United States

WP.PD.10 **ENERGY MINIMIZATION METHODS FOR CELL MOTION CORRECTION AND INTRACELLULAR ANALYSIS IN LIVE-CELL FLUORESCENCE MICROSCOPY**
Oleh Dzyubachyk, Wiggert A. van Cappellen, Jeroen Essers, Wiro Niessen, Erik Meijering, Erasmus MC - University Medical Center Rotterdam, Netherlands

WP.PD.11 **3D RECONSTRUCTION FROM ELECTRON MICROSCOPE IMAGES WITH TXBR**
Albert Lawrence, Sebastien Phan, University of California, San Diego, United States; Farshid Moussavi, Stanford University, United States

WP.PD.12 **ULTRASTRUCTURAL MAPPING OF NEURAL CIRCUITRY: A COMPUTATIONAL FRAMEWORK**
James Anderson, Bryan Jones, Jia Hui Yang, Maggie Shaw, Carl Watt, Moran Eye Center, United States; Paul Koshevoy, Joël Spaltenstein, Elizabeth Jurrus, Kannan Umadevi Venkataraju, Ross Whitaker, University of Utah, United States; David Mastronarde, Boulder Laboratory For 3-D Electron Microscopy of Cells, United States; Tolga Tasdizen, University of Utah, United States; Robert Marc, Moran Eye Center, United States

WP.PE: Wednesday, July 1, 08:00 - 09:15

WP.PE **Software** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area E
Chair: Evangelia I. Zacharaki, University of Patras

WP.PE.1 **ACQUIARIUM: FREE SOFTWARE FOR THE ACQUISITION AND ANALYSIS OF 3D IMAGES OF CELLS IN FLUORESCENCE MICROSCOPY**
Pavel Matula, Martin Maška, Ondrej Danek, Petr Matula, Michal Kozubek, Masaryk University, Czech Republic

WP.PE.2 **TETRAHEDRAL MESH GENERATION FROM VOLUMETRIC BINARY AND GRAYSCALE IMAGES**
Qianqian Fang, David Boas, Massachusetts General Hospital, United States

WP.PE.3 **SOFTWARE DEVELOPMENT FOR NEUROIMAGING: PROMOTING COMMUNITY ACCESS AND BEST PRACTICES THROUGH NITRC**
David Kennedy, University of Massachusetts Medical Center, United States; Christian Haselgrove, Neuromorphometrics, Inc., United States; Robert Buccigrossi, TCG, Inc., United States; Jeffrey Grethe, University of California, San Diego, United States

WP.PF: Wednesday, July 1, 08:00 - 09:15

WP.PF **Tracking P1** (Poster)
Time: Wednesday, July 1, 08:00 - 09:15
Place: Plaza Ballroom Area F
Chair: Stanley Reeves, Auburn University

WP.PF.1 **INFLUENCE OF SYSTEM GEOMETRY ON MOTION TRACKING IN ECHOCARDIOGRAPHIC IMAGE SEQUENCES**
Basma Touil, Adrian Basarab, Olivier Bernard, Denis Friboulet, CREATIS - LRMN, France

WP.PF.2 **TRACKING CELL MOTION USING GM-PHD**
Radford Juang, Andre Levchenko, Philippe Burlina, Johns Hopkins University, United States

WP.PF.3 **A NOVEL MULTIPLE PARTICLE TRACKING ALGORITHM FOR NOISY IN VIVO DATA BY MINIMAL PATH OPTIMIZATION WITHIN THE SPATIO-TEMPORAL VOLUME**
Quan Xue, Mark C. Leake, University of Oxford, United Kingdom

WP.PF.4 **IN VIVO EXAMINATION OF HUMAN LIPOMAS WITH FREEHAND ELASTOGRAPHY - PRELIMINARY RESULTS**
Elisabeth Brusseau, Olivier Basset, CREATIS, France

WO1.R1 **Fluorescence Microscopy** (Lecture)
Time: Wednesday, July 1, 10:45 - 12:05
Place: Georgian
Chair: Jean-Christope Olivo-Marin, Institut Pasteur, CNRS URA 2582

10:45 - 11:05
WO1.R1.1 **STEERABLE FILTERS FOR ORIENTATION ESTIMATION AND LOCALIZATION OF FLUORESCENT DIPOLES**
François Aguet, Stefan Geissbühler, Iwan Märki, Theo Lasser, Michael Unser, Ecole Polytechnique Fédérale de Lausanne, Switzerland

11:05 - 11:25
WO1.R1.2 **IDENTIFYING FUSION EVENTS IN FLUORESCENCE MICROSCOPY IMAGES**
William J. Godinez, University of Heidelberg and DKFZ Heidelberg, Germany; Marko Lampe, University of Heidelberg, Germany; Stefan Wörz, Roland Eils, University of Heidelberg and DKFZ Heidelberg, Germany; Barbara Müller, University of Heidelberg, Germany; Karl Rohr, University of Heidelberg and DKFZ Heidelberg, Germany

11:25 - 11:45
WO1.R1.3 **APPLICATION OF 3D LOCAL PHASE THEORY IN VESSEL SEGMENTATION**
Po Wang, Catherine Kelly, Michael Brady, University of Oxford, United Kingdom

11:45 - 12:05
WO1.R1.4 **QUANTITATIVE COMPARISON OF SPOT DETECTION METHODS IN LIVE-CELL FLUORESCENCE MICROSCOPY IMAGING**
Ihor Smal, Erasmus MC - University Medical Center Rotterdam, Netherlands; Marco Loog, Delft University of Technology, Netherlands; Wiro Niessen, Erik Meijering, Erasmus MC - University Medical Center Rotterdam, Netherlands

WO1.R2: Wednesday, July 1, 10:45 - 12:05

WO1.R2 **Segmentation using Atlases** (Lecture)
Time: Wednesday, July 1, 10:45 - 12:05
Place: Arlington
Chair: Daniel Rueckert, Imperial College London

10:45 - 11:05
WO1.R2.1 **SEGMENTATION OF ANATOMO-FUNCTIONAL 3D POST MORTEM DATA USING A MRI-BASED 3D DIGITAL ATLAS: TRANSGENIC MOUSE BRAINS STUDY**
Jessica Lebenberg, Anne-Sophie Hérard, Albertine Dubois, Marc Dhenain, Philippe Hantraye, Vincent Frouin, Thierry Delzescaux, Commissariat à l'Energie Atomique, France

11:05 - 11:25
WO1.R2.2 **LABEL FUSION USING PERFORMANCE ESTIMATION WITH ITERATIVE LABEL SELECTION**
Robin Langerak, Uulke van der Heide, Irene Lips, Alexis Kotte, Marco van Vulpen, Josien P. W. Pluim, University Medical Center Utrecht, Netherlands

11:25 - 11:45
WO1.R2.3 **USING CONSENSUS MEASURES FOR ATLAS CONSTRUCTION**
Liliane Ramus, Grégoire Malandain, INRIA Universite de Nice Sophia Antipolis, France

11:45 - 12:05
WO1.R2.4 **THE MIRROR METHOD OF ASSESSING SEGMENTATION QUALITY IN ATLAS LABEL PROPAGATION**
Rolf A. Heckemann, Alexander Hammers, Paul Aljabar, Daniel Rueckert, Joseph V. Hajnal, Imperial College London, United Kingdom

WO1.R3: Wednesday, July 1, 10:45 - 12:05

WO1.R3 **Emerging Photonic Imaging Techniques** (Special Session)
Time: Wednesday, July 1, 10:45 - 12:05
Place: Berkeley/Clarendon
Chair: Vasilis Ntziachristos, Technical University of Munich

10:45 - 11:05
WO1.R3.1 **QUANTITATIVE MULTIPARAMETRIC TWO-PHOTON IMAGING OF TISSUES**
Irene Georgakoudi, Jonathan Levitt, William Rice, David Kaplan, Tufts University, United States

11:05 - 11:25
WO1.R3.2 **OPTOACOUSTIC SYSTEMS FOR FUNCTIONAL AND MOLECULAR IMAGING IN CLINICAL AND PRECLINICAL RESEARCH**
Alexander Oraevsky, Fairway Medical Technologies, Inc., United States

11:25 - 11:45
WO1.R3.3 **PHOTOACOUSTIC TOMOGRAPHY: HIGH-RESOLUTION IMAGING OF OPTICAL CONTRAST IN VIVO AT SUPERDEPTHS**
Lihong Wang, Washington University in St. Louis, United States

11:45 - 12:05
WO1.R3.4 **ADVANCING MOLECULAR IMAGING WITH MULTI-SPECTRAL OPTO-ACOUSTIC TOMOGRAPHY (MSOT)**
Vasilis Ntziachristos, Techische Universitaet of Muenchen and Helmholtz Zentrum Muenchen, Germany

WO1.R4 **Image-Guided Surgery** (Lecture)
Time: Wednesday, July 1, 10:45 - 12:05
Place: Stanbro
Chair: Gregory Sharp, Massachusetts General Hospital

10:45 - 11:05
WO1.R4.1 **STENT GRAFT REMOVAL FOR IMPROVING 2D-3D REGISTRATION**
Maximilian Baust, Stefanie Demirci, Nassir Navab, Technische Universität München, Germany

11:05 - 11:25
WO1.R4.2 **VIRTUAL MOVEMENTS-BASED CALIBRATION METHOD OF ULTRASOUND PROBE FOR COMPUTER ASSISTED SURGERY**
Jean Chaoui, Guillaume Dardenne, Chafiaa Hamitouche, Inserm U650, Telecom Bretagne, France; Eric Stindel, Inserm U650, CHU Brest, Service d'Orthopédie-Traumatologie, France; Christian Roux, Inserm U650, Telecom Bretagne, France

11:25 - 11:45
WO1.R4.3 **TRANSRECTAL ULTRASOUND PROSTATE BIOPSY TRACKING WITH EFFICIENT AND ACCURATE DEFORMATION ESTIMATION**
Michael Baumann, Joseph Fourier University, France; Pierre Mozer, Pitié-Salpétrière Hospital, France; Vincent Daanen, Koelis SAS, France; Jocelyne Troccaz, Joseph Fourier University, France

11:45 - 12:05
WO1.R4.4 **HEMODYNAMIC ALTERATIONS OF A PATIENT-SPECIFIC INTRACRANIAL ANEURYSM INDUCED BY VIRTUAL DEPLOYMENT OF STENTS IN VARIOUS AXIAL ORIENTATION**
Minsuok Kim, Universitat Pompeu Fabra, Spain; Ignacio Larrabide, Networking Center on Biomedical Research (CIBER-BBN), Spain; Maria-Cruz Villa-Uriol, Alejandro Frangi, Universitat Pompeu Fabra, Spain

WO2.R1: Wednesday, July 1, 13:30 - 14:50

WO2.R1 **Cancer Imaging** (Lecture)
Time: Wednesday, July 1, 13:30 - 14:50
Place: Georgian
Chair: Til Aach, RWTH Aachen University

13:30 - 13:50
WO2.R1.1 **FEATURE EXTRACTION FROM CANCER IMAGES USING LOCAL PHASE CONGRUENCY: A RELIABLE SOURCE OF IMAGE DESCRIPTORS**
Tuende Szilagyi, Michael Brady, University of Oxford, United Kingdom

13:50 - 14:10
WO2.R1.2 **ANISOTROPIC BEHAVIOUR OF BREAST TISSUE FOR LARGE COMPRESSIONS**
Christine Tanner, Mark White, Salvatore Guarino, University College London, United Kingdom; Margaret A. Hall-Craggs, University College Hospital London, United Kingdom; Michael Douek, David J. Hawkes, University College London, United Kingdom

14:10 - 14:30
WO2.R1.3 **SEGMENTATION AND CLASSIFICATION OF TRIPLE NEGATIVE BREAST CANCERS USING DCE-MRI**
Shannon Agner, Jun Xu, Hussain Fatakdawala, Shridar Ganesan, Anant Madabhushi, Rutgers University, United States; Sarah Englander, Mark Rosen, Kathleen Thomas, Mitchell Schnall, Michael Feldman, John Tomaszewski, University of Pennsylvania, United States

14:30 - 14:50
WO2.R1.4 **SPATIO-TEMPORAL DECONVOLUTION OF PERFUSION CT DATA IN RECTAL TUMOR PATIENTS**
Lili He, Massachusetts General Hospital, United States; Burkay Orten, Boston University, United States; Synho Do, Massachusetts General Hospital, United States; W. Clem Karl, Boston University, United States; Avinish Kambadakone, Dushyant Sahani, Homer Pien, Massachusetts General Hospital, United States

WO2.R2: Wednesday, July 1, 13:30 - 14:50

WO2.R2 **Image-guided Therapy** (Lecture)
Time: Wednesday, July 1, 13:30 - 14:50
Place: Arlington
Chair: Alex Frangi, Universitat Pompeu Fabra

13:30 - 13:50
WO2.R2.1 **REGULARIZED REFERENCELESS TEMPERATURE ESTIMATION IN PRF-SHIFT MR THERMOMETRY**
William Grissom, Kim Butts-Pauly, Michael Lustig, Viola Rieke, John Pauly, Stanford University, United States; Nathan McDannold, Harvard Medical School, United States

13:50 - 14:10
WO2.R2.2 **FIXED GANTRY TOMOSYNTHESIS SYSTEM FOR RADIATION THERAPY IMAGE GUIDANCE BASED ON A MULTIPLE SOURCE X-RAY TUBE WITH CARBON NANOTUBE CATHODES**
Jonathan Maltz, Siemens Healthcare, United States; Frank Sprenger, XinRay Systems LLC, United States; Jens Fuerst, Ajay Paidi, Franz Fadler, Ali Bani-Hashemi, Siemens Healthcare, Germany

14:10 - 14:30
WO2.R2.3 **IMAGE GUIDED COMPLEX DOSE DELIVERY FOR SMALL ANIMAL RADIOTHERAPY**
Mohammad Matinfar, Santosh Iyer, Eric Ford, John Wong, Peter Kazanzides, Johns Hopkins University, United States

14:30 - 14:50
WO2.R2.4 **VOLES: VASCULARITY-ORIENTED LEVEL SET ALGORITHM FOR PULMONARY VESSEL SEGMENTATION IN IMAGE GUIDED INTERVENTION THERAPY**
Xiangjun Zhu, Zhong Xue, Xin Gao, The Methodist Hospital Research Institute and Department of Radiology, United States; Yisheng Zhu, Shanghai Jiao Tong University, China; Stephen Wong, The Methodist Hospital Research Institute and Department of Radiology, United States

WO2.R3 **Structure and Function from Microscopy Images** (Lecture)
Time: Wednesday, July 1, 13:30 - 14:50
Place: Berkeley/Clarendon
Chair: William Bosl, Harvard Medical School

13:30 - 13:50
WO2.R3.1 **ANALYSIS OF NERVE ACTIVITY AND OPTICAL SIGNALS FROM MOUSE BRAIN STEM TO IDENTIFY CELLS GENERATING RESPIRATORY RHYTHMS**
Gavriil Tsechpenakis, University of Miami, United States; Jaime Eugenin, Universidad de Santiago de Chile, Chile; John G. Nicholls, Scuola Internazionale Superiore di Studi Avanzati, Italy; Kenneth J. Muller, Miller School of Medicine, University of Miami, United States

13:50 - 14:10
WO2.R3.2 **A NOVEL SURFACE-BASED GEOMETRIC APPROACH FOR 3D DENDRITIC SPINE DETECTION FROM MULTI-PHOTON EXCITATION MICROSCOPY IMAGES**
Qing Li, Xiaobo Zhou, The Methodist Hospital Research Institute, United States; Zhigang Deng, University of Houston, United States; Matthew Baron, Merille A. Teylan, Yong Kim, The Rockefeller University, United States; Stephen Wong, The Methodist Hospital Research Institute, United States

14:10 - 14:30
WO2.R3.3 **A LOCAL MAXIMUM INTENSITY PROJECTION TRACING OF VASCULATURE IN KNIFE-EDGE SCANNING MICROSCOPE VOLUME DATA**
Donghyeop Han, John Keyser, Yoonsuck Choe, Texas A&M University, United States

14:30 - 14:50
WO2.R3.4 **ELASTIC SOURCE SELECTION FOR IN VIVO IMAGING OF NEURONAL ENSEMBLES**
Logan Grosenick, Todd Anderson, Stephen J. Smith, Stanford University, United States

WO2.R4 **Reconstruction with Priors** (Lecture)
Time: Wednesday, July 1, 13:30 - 14:50
Place: Stanbro
Chair: Jong Chul Ye, Korea Advanced Institute of Technology

13:30 - 13:50
WO2.R4.1 **DIFFERENTIAL EQUATION-DRIVEN REGULARIZATION FOR JOINT FMT-CT IMAGING**
Damon Hyde, Children's Hospital Boston and Harvard Medical School, United States; Eric Miller, Tufts University, United States; Dana H. Brooks, Northeastern University, United States; Vasilis Ntziachristos, Technical University of Munich and Helmholtz Center Munich, United States

13:50 - 14:10
WO2.R4.2 **ROBUST METHODS FOR RECONSTRUCTING BRAIN ACTIVITY AND FUNCTIONAL CONNECTIVITY BETWEEN BRAIN SOURCES WITH MEG/EEG DATA**
Julia Owen, David Wipf, University of California, San Francisco, United States; Hagai Attias, Golden Metallic, Inc., United States; Kensuke Sekihara, Tokyo Metro. University, Japan; Srikantan Nagarajan, University of California, San Francisco, United States

14:10 - 14:30
WO2.R4.3 **OPTIMAL ILLUMINATION PATTERNS FOR FLUORESCENCE TOMOGRAPHY**
Joyita Dutta, Sangtae Ahn, University of Southern California, United States; Anand Joshi, University of California, Los Angeles, United States; Richard M. Leahy, University of Southern California, United States

14:30 - 14:50
WO2.R4.4 **ROBUST INCORPORATION OF ANATOMICAL PRIORS INTO LIMITED VIEW TOMOGRAPHY USING MULTIPLE CLUSTER MODELLING OF THE JOINT HISTOGRAM**
Dominique Van de Sompel, Michael Brady, University of Oxford, United Kingdom

WO3.R1: Wednesday, July 1, 15:00 - 16:20

WO3.R1 **Biomedical Computing on Many Cores** (Special Session)
Time: Wednesday, July 1, 15:00 - 16:20
Place: Georgian
Co-Chairs: Robin Cleveland, Boston University and Tyrone Porter, Boston University

15:00 - 15:20
WO3.R1.1 **ACCELERATING MR IMAGE RECONSTRUCTION ON GPUS**
Wen-mei Hwu, Deepthi Nandakumar, Justin Haldar, University of Illinois, Urbana-Champaign, United States; Ian Atkins, University of Illinois, Chicago, United States; Bradley Sutton, Zhi-Pei Liang, University of Illinois, Urbana-Champaign, United States; Keith Thulborn, University of Illinois, Chicago, United States

15:20 - 15:40
WO3.R1.2 **ACCELERATING REGULARIZED ITERATIVE CT RECONSTRUCTION ON COMMODITY GRAPHICS HARDWARE (GPU)**
Wei Xu, Klaus Mueller, Stony Brook University, United States

15:40 - 16:00
WO3.R1.3 **BIOMEDICAL IMAGING ECOSYSTEM AND THE ROLE OF THE GPU**
Kimberly Powell, nVidia, United States

16:00 - 16:20
WO3.R1.4 **PROFILE-GUIDED OPTIMIZATION OF CRITICAL MEDICAL IMAGING ALGORITHMS**
David Kaeli, Byunghyun Jang, Perhaad Mistry, Dana Schaa, Northeastern University, United States

WO3.R2: Wednesday, July 1, 15:00 - 16:20

WO3.R2 **Segmentation in Microscopy** (Lecture)
Time: Wednesday, July 1, 15:00 - 16:20
Place: Arlington
Chair: Tom Fletcher, University of Utah

15:00 - 15:20
WO3.R2.1 **A NEW VARIATIONAL METHOD TO DETECT POINTS IN BIOLOGICAL IMAGES**
Daniele Graziani, Laure Blanc-Feraud, INRIA Universite de Nice Sophia Antipolis, France; Gilles Aubert, Universite de Nice Sophia Antipolis, France

15:20 - 15:40
WO3.R2.2 **POISSON INVERSE GRADIENT APPROACH TO VASCULAR MYOCYTE DETECTION AND SEGMENTATION**
Scott Acton, Clare Yang, John Hossack, Brian Wamhoff, University of Virginia, United States

15:40 - 16:00
WO3.R2.3 **AUTOMATED ACTIN FILAMENT SEGMENTATION, TRACKING AND TIP ELONGATION MEASUREMENTS BASED ON OPEN ACTIVE CONTOUR MODELS**
Hongsheng Li, Tian Shen, Matthew Smith, Lehigh University, United States; Ikuko Fujiwara, National Heart, Lung and Blood Institute, United States; Dimitrios Vavylonis, Xiaolei Huang, Lehigh University, United States

16:00 - 16:20
WO3.R2.4 **A CAGRID-ENABLED, LEARNING BASED IMAGE SEGMENTATION METHOD FOR HISTOPATHOLOGY SPECIMENS**
David Foran, Lin Yang, University of Medicine and Dentistry of New Jersey, United States; Oncel Tuzel, Rutgers University, United States; Wenjin Chen, Jun Hu, University of Medicine and Dentistry of New Jersey, United States; Tahsin Kurc, Emory University, United States; Renato Ferreira, Ohio State University, United States; Joel Saltz, Emory University, United States

WO3.R3 **Classification and Cancer Imaging** (Lecture)
Time: Wednesday, July 1, 15:00 - 16:20
Place: Berkeley/Clarendon
Chair: Andrew Laine, Columbia University

15:00 - 15:20
WO3.R3.1 **RENAL TUMOR QUANTIFICATION AND CLASSIFICATION IN TRIPLE-PHASE CONTRAST-ENHANCED ABDOMINAL CT**
Marius George Linguraru, Rabindra Gautam, James Peterson, Jianhua Yao, W. Marston Linehan, Ronald M. Summers, National Institutes of Health, United States

15:20 - 15:40
WO3.R3.2 **LEARNING DISEASE SEVERITY FOR CAPSULE ENDOSCOPY IMAGES**
Rajesh Kumar, Purnima Rajan, Srdan Bejakovic, Sharmishtaa Seshamani, Johns Hopkins University, United States; Gerard Mullin, Johns Hopkins Hospital, United States; Themistocles Dassopoulos, Washington University, United States; Gregory Hager, Johns Hopkins University, United States

15:40 - 16:00
WO3.R3.3 **DERMOSCOPIC INTEREST POINT DETECTOR AND DESCRIPTOR**
Howard Zhou, Georgia Institute of Technology, United States; Mei Chen, Intel Research Pittsburgh, United States; James M. Rehg, Georgia Institute of Technology, United States

16:00 - 16:20
WO3.R3.4 **LOCALIZING THE DERMIS/EPIDERMIS BOUNDARY IN REFLECTANCE CONFOCAL MICROSCOPY IMAGES WITH A HYBRID CLASSIFICATION ALGORITHM**
Sila Kurugol, Jennifer G. Dy, Northeastern University, United States; Milind Rajadhyaksha, Memorial Sloan-Kettering Cancer Center, United States; Dana H. Brooks, Northeastern University, United States

WO3.R4: Wednesday, July 1, 15:00 - 16:20

WO3.R4 **MRI of the Brain** (Lecture)
Time: Wednesday, July 1, 15:00 - 16:20
Place: Stanbro
Chair: Yongmei Michelle Wang, University of Illinois

15:00 - 15:20
WO3.R4.1 **GRAPH WAVELET APPLIED TO HUMAN BRAIN CONNECTIVITY**
Pierre Besson, Christine Delmaire, Vianney Le Thuc, CHRU Lille, France; Stéphane Lehéricy, Center for NeuroImaging Research, France; Florence Pasquier, Xavier Leclerc, CHRU Lille, France

15:20 - 15:40
WO3.R4.2 **AUTOMATICALLY LEARNING CORTICAL FOLDING PATTERNS**
Matthew Toews, Brigham and Women's Hospital, Harvard Medical School, United States; D. Louis Collins, Montreal Neurological Institute, McGill University, Canada; Tal Arbel, Centre for Intelligent Machines, McGill University, Canada

15:40 - 16:00
WO3.R4.3 **AUTOMATED RECONSTRUCTION OF THE CEREBRAL CORTEX IN MULTIPLE SCLEROSIS PATIENTS**
Navid Shiee, Pierre-Louis Bazin, Daniel S. Reich, Dzung L. Pham, Johns Hopkins University, United States

16:00 - 16:20
WO3.R4.4 **A QUANTITATIVE COMPARISON OF THREE METHODS FOR INFLATING CORTICAL MESHES**
Erik Bonner, Oscar Acosta, Jurgen Fripp, Olivier Salvado, CSIRO, Australia

WO4.R1: Wednesday, July 1, 16:40 - 18:00

WO4.R1 **Tracking** (Lecture)
Time: Wednesday, July 1, 16:40 - 18:00
Place: Georgian
Chair: Stanley Reeves, Auburn University

16:40 - 17:00
WO4.R1.1 **USING PHYSICS ENGINES TO TRACK OBJECTS IN IMAGES**
Fabrice de Chaumont, Alexandre Dufour, Pierre Serreau, Johnathan Chabout, Institut Pasteur, France; Sylvia Münter, Friedrich Frischknecht, University of Heidelberg MS, Germany; Sylvie Granon, CNRS, France; Jean-Christophe Olivo-Marin, Institut Pasteur, France

17:00 - 17:20
WO4.R1.2 **MULTIPLE HYPOTHESIS TRACKING IN MICROSCOPY IMAGES**
Nicolas Chenouard, Institut Pasteur, CNRS URA 2582, France; Isabelle Bloch, Télécom ParisTech, CNRS UMR 5141 LTCI, France; Jean-Christophe Olivo-Marin, Institut Pasteur, CNRS URA 2582, France

17:20 - 17:40
WO4.R1.3 **IN VIVO COMPARISON OF REAL-TIME TRACKING ALGORITHMS FOR INTERVENTIONAL FLEXIBLE ENDOSCOPY**
Norbert Masson, Florent Nageotte, Philippe Zanne, Michel de Mathelin, Strasbourg University, France

17:40 - 18:00
WO4.R1.4 **TISSUE LEVEL SEGMENTATION AND TRACKING OF BIOLOGICAL STRUCTURES IN MICROSCOPIC IMAGES BASED ON DENSITY MAPS**
Kishore Mosaliganti, Arnaud Gelas, Alexandre Gouaillard, Nikolaus Obholzer, Ramil Noche, Sean Megason, Harvard Medical School, United States

WO4.R2: Wednesday, July 1, 16:40 - 18:00

WO4.R2 **Segmentation III** (Lecture)
Time: Wednesday, July 1, 16:40 - 18:00
Place: Arlington
Chair: Arrate Muñoz-Barrutia, University of Navarra

16:40 - 17:00
WO4.R2.1 **AN ACTIVE SURFACE MODEL FOR VOLUMETRIC IMAGE SEGMENTATION**
Noha El-Zehiry, Adel Elmaghraby, University of Louisville, United States

17:00 - 17:20
WO4.R2.2 **INTEGRATING MULTI-SCALE BLOB/CURVILINEAR DETECTOR TECHNIQUES AND MULTI-LEVEL SETS FOR AUTOMATED SEGMENTATION OF STEM CELL IMAGES**
Huiming Peng, Xiaobo Zhou, Fuhai Li, Xiaofeng Xia, Stephen Wong, The Methodist Hospital Research Institute, United States

17:20 - 17:40
WO4.R2.3 **3D JOINT MARKOV-GIBBS MODEL FOR SEGMENTING THE BLOOD VESSELS FROM MRA**
Ayman El-Baz, University of Louisville, United States; Georgy Gimel'farb, University of Auckland, New Zealand; Vedant Kumar, University of Louisville, United States; Robert Falk, Jewish Hospital, United States; Mohamed Abo El-Ghar, University of Mansoura, Egypt

17:40 - 18:00
WO4.R2.4 **AUTOMATED SEGMENTATION OF RETINAL LAYERS IN OCT IMAGING AND DERIVED OPHTHALMIC MEASURES**
Florence Rossant, ISEP, France; Itebeddine Ghorbel, ISEP and Telecom ParisTech, France; Isabelle Bloch, TELECOM ParisTech, France; Michel Pâques, Sarah Tick, Centre Hospitalier National des Quinze-Vingts, France

WO4.R3: Wednesday, July 1, 16:40 - 18:00

WO4.R3 **Microscopy Imaging** (Lecture)
Time: Wednesday, July 1, 16:40 - 18:00
Place: Berkeley/Clarendon
Chair: Erik Meijering, Erasmus MC - University Medical Center Rotterdam

16:40 - 17:00
WO4.R3.1 **A COMPRESSED SENSING APPROACH FOR BIOLOGICAL MICROSCOPIC IMAGE PROCESSING**
Marcio de Moraes Marim, Institut Pasteur, France; Elsa D. Angelini, Institut TELECOM, France; Jean-Christophe Olivo-Marin, Institut Pasteur, France

17:00 - 17:20
WO4.R3.2 **TUNABLE TENSOR VOTING FOR REGULARIZING PUNCTATE PATTERNS OF MEMBRANE-BOUND PROTEIN SIGNALS**
Leandro A. Loss, Lawrence Berkeley National Laboratory, United States; George Bebis, University of Nevada, Reno, United States; Bahram Parvin, Lawrence Berkeley National Laboratory, United States

17:20 - 17:40
WO4.R3.3 **IDENTIFICATION OF CELLULAR DYNAMIC PATTERNS RESULTING FROM REPETITIVE PHOTOBLEACHING USING INDEPENDENT COMPONENT ANALYSIS**
Alice van Gemert, Carolina Jost, Annelies van der Laan, Roeland Dirks, Johan Reiber, Hans Tanke, Boudewijn Lelieveldt, Leiden University Medical Center, Netherlands

17:40 - 18:00
WO4.R3.4 **NOISE ADAPTIVE MATRIX EDGE FIELD ANALYSIS OF SMALL SIZED HETEROGENEOUS ONION LAYERED TEXTURES FOR CHARACTERIZING HUMAN EMBRYONIC STEM CELL NUCLEI**
Mukund Desai, Rami Mangoubi, C.S. Draper Laboratory, United States; Paul Sammak, Magee Womens Research Institute, United States

WO4.R4 **DTI II** (Lecture)
Time: Wednesday, July 1, 16:40 - 18:00
Place: Stanbro
Chair: Carl-Fredrik Westin, Brigham & Womens Hospital

16:40 - 17:00
WO4.R4.1 **SEGMENTING CROSSING FIBER GEOMETRIES USING FLUID MECHANICS TENSOR DISTRIBUTION FUNCTION TRACTOGRAPHY**
Nathan Hageman, Alex D. Leow, David Shattuck, Liang Zhan, Paul M. Thompson, Siwei Zhu, Arthur W. Toga, University of California, Los Angeles, United States

17:00 - 17:20
WO4.R4.2 **ROBUST GRAPH-BASED TRACKING THROUGH CROSSING FIBRE CONFIGURATIONS**
Stamatios Sotiropoulos, Christopher Tench, University of Nottingham, United Kingdom; Paul Morgan, Medical University of South Carolina, United States; Li Bai, University of Nottingham, United Kingdom

17:20 - 17:40
WO4.R4.3 **ODF RECONSTRUCTION IN Q-BALL IMAGING WITH SOLID ANGLE CONSIDERATION**
Iman Aganj, Christophe Lenglet, Guillermo Sapiro, University of Minnesota, United States

17:40 - 18:00
WO4.R4.4 **ANALYZING MULTI-FIBER RECONSTRUCTION IN HIGH ANGULAR RESOLUTION DIFFUSION IMAGING USING THE TENSOR DISTRIBUTION FUNCTION**
Liang Zhan, Alex D. Leow, Siwei Zhu, Ming-Chang Chiang, Marina Barysheva, Arthur W. Toga, University of California, Los Angeles, United States; Katie L. McMahon, Greig I. de Zubicaray, Functional MRI Laboratory, Centre for Magnetic Resonance, Australia; Margaret J. Wright, Queensland Institute of Medical Research, Australia; Paul M. Thompson, University of California, Los Angeles, United States

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