PROCEEDINGS OF SPIE

SPIDigitalLibrary.org/conference-proceedings-of-spie

Front Matter: Volume 9038

, "Front Matter: Volume 9038," Proc. SPIE 9038, Medical Imaging 2014: Biomedical Applications in Molecular, Structural, and Functional Imaging, 903801 (18 April 2014); doi: 10.1117/12.2065271

SPIE.

Event: SPIE Medical Imaging, 2014, San Diego, California, United States

Medical Imaging 2014

Biomedical Applications in Molecular, Structural, and Functional Imaging

Robert C. Molthen

John B. Weaver

Editors

16–18 February 2014

San Diego, California, United States

Sponsored by

SPIE

Cosponsored by

Modus Medical Devices Inc. (Canada) • XIFIN, Inc. • Ventana Medical Systems Inc. • Intrace Medical (Switzerland)

Cooperating Organizations

AAPM—American Association of Physicists in Medicine (United States) • APS—American Physiological Society • CARS—Computer Assisted Radiology and Surgery (Germany) • The DICOM Standards Committee • Medical Image Perception Society (United States) • Radiological Society of North America (United States) • Society for Imaging Informatics in Medicine (United States) • World Molecular Imaging Society

Published by

SPIE

Volume 9038

Proceedings of SPIE, 1605-7422, V. 9038

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Medical Imaging 2014: Biomedical Applications in Molecular, Structural, and Functional Imaging,
edited by Robert C. Molthen, John B. Weaver, Proc. of SPIE Vol. 9038, 903801
© 2014 SPIE · CCC code: 1605-7422/14/\$18 · doi: 10.1117/12.2065271

Proc. of SPIE Vol. 9038 903801-1

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:

Author(s), "Title of Paper," in *Medical Imaging 2014: Biomedical Applications in Molecular, Structural, and Functional Imaging*, edited by Robert C. Molthen, John B. Weaver, Proceedings of SPIE Vol. 9038 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 1605-7422

ISBN: 9780819498311

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2014, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 1605-7422/14/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID Number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID Number.

Contents

xiii	Conference Committee
xv	Introduction
xvii	2014 Medical Imaging Paper Award Recipients

SESSION 1 GENERAL MR TECHNIQUES

9038 02	Abdominal adipose tissue quantification on water-suppressed and non-water-suppressed MRI at 3T using semi-automated FCM clustering algorithm [9038-1] S. K. Valaparla, The Univ. of Texas Health Science Ctr. at San Antonio (United States); Q. Peng, Albert Einstein College of Medicine and Montefiore Medical Ctr. (United States); F. Gao, G. D. Clarke, The Univ. of Texas Health Science Ctr. at San Antonio (United States)
9038 03	Accelerated self-gated UTE MRI of the murine heart [9038-2] A. G. Motaal, N. Noorman, W. L. De Graaf, L. J. Florack, K. Nicolay, G. J. Strijkers, Eindhoven Univ. of Technology (Netherlands)
9038 04	Regional cyst concentration as a prognostic biomarker for polycystic kidney disease [9038-3] J. D. Warner, M. V. Irazabal, V. E. Torres, B. F. King, B. J. Erickson, Mayo Clinic (United States)
9038 05	Supervised multi-view canonical correlation analysis: fused multimodal prediction of disease diagnosis and prognosis [9038-4] A. Singanamalli, H. Wang, G. Lee, Case Western Reserve Univ. (United States); N. Shih, M. Rosen, S. Master, Univ. of Pennsylvania (United States); J. Tomaszewski, Univ. at Buffalo (United States); M. Feldman, Univ. of Pennsylvania (United States); A. Madabhushi, Case Western Reserve Univ. (United States)
9038 06	Target image search using fMRI signals [9038-5] S. Xiong, Beijing Normal Univ. (China); S. Song, Jinan Univ. (China); Y. Zhan, J. Zhang, Beijing Normal Univ. (China)

SESSION 2 FMRI AND BRAIN

9038 07	Different brain activations between own- and other-race face categorization: an fMRI study using group independent component analysis [9038-6] W. Wei, Institute of Automation (China); J. Liu, Beijing Jiaotong Univ. (China); R. Dai, L. Feng, Institute of Automation (China); L. Li, Beijing Jiaotong Univ. (China); J. Tian, Institute of Automation (China)
---------	---

- 9038 08 **Effects of non-neuronal components for functional connectivity analysis from resting-state functional MRI toward automated diagnosis of schizophrenia** [9038-7]
J. Kim, Korea Univ. (Korea, Republic of) and Samsung Advanced Institute of Technology (Korea, Republic of); J.-H. Lee, Korea Univ. (Korea, Republic of)
- 9038 09 **Alternations of functional connectivity in amblyopia patients: a resting-state fMRI study** [9038-8]
J. Wang, Institute of Automation (China); L. Hu, Beijing Tongren Hospital, Capital Medical Univ. (China); W. Li, Institute of Automation (China) and Beijing Univ. of Technology (China); J. Xian, L. Ai, Beijing Tongren Hospital, Capital Medical Univ. (China); H. He, Institute of Automation (China)
- 9038 0A **Longitudinal MR cortical thinning of individuals and its correlation with PET metabolic reduction: a measurement consistency and correctness studies** [9038-9]
Z. S. Lin, G. Avinash, K. McMillan, L. Yan, GE Healthcare (United States); S. Minoshima, Univ. of Washington (United States)
- 9038 0B **Independent component analysis of DTI data reveals white matter covariances in Alzheimer's disease** [9038-10]
X. Ouyang, X. Sun, T. Guo, Q. Sun, Beijing Normal Univ. (China); K. Chen, Banner Alzheimer's Institute (United States); L. Yao, X. Wu, X. Guo, Beijing Normal Univ. (China)
- 9038 0C **A brain MRI atlas of the common squirrel monkey, *Saimiri sciureus*** [9038-11]
Y. Gao, K. G. Schilling, S. P. Khare, S. Panda, A. S. Choe, I. Stepniewska, X. Li, Z. Ding, A. Anderson, B. A. Landman, Vanderbilt Univ. (United States)

SESSION 3 OPTICAL COHERENCE TOMOGRAPHY

- 9038 0D **Incorporation of learned shape priors into a graph-theoretic approach with application to the 3D segmentation of intraretinal surfaces in SD-OCT volumes of mice** [9038-12]
B. J. Antony, The Univ. of Iowa (United States); Q. Song, GE Global Research (United States); M. D. Abramoff, The Univ. of Iowa (United States) and Iowa City VA Health Care System (United States); E. Sohn, X. Wu, The Univ. of Iowa (United States); M. K. Garvin, Iowa City VA Health Care System (United States) and The Univ. of Iowa (United States)
- 9038 0F **3D graph-based automated segmentation of corneal layers in anterior-segment optical coherence tomography images of mice** [9038-14]
V. A. Robles, The Univ. of Iowa (United States) and Iowa City VA Health Care System (United States); B. J. Antony, D. R. Koehn, The Univ. of Iowa (United States); M. G. Anderson, The Univ. of Iowa (United States) and Iowa City VA Health Care System (United States); M. K. Garvin, Iowa City VA Health Care System (United States) and The Univ. of Iowa (United States)
- 9038 0G **Microcystic macular edema detection in retina OCT images** [9038-15]
E. K. Swingle, The Ohio State Univ. (United States); A. Lang, A. Carass, H. S. Ying, P. A. Calabresi, Johns Hopkins Univ. School of Medicine (United States); J. L. Prince, Johns Hopkins Univ. (United States)

- 9038 OH **Optic disc boundary segmentation from diffeomorphic demons registration of monocular fundus image sequences versus 3D visualization of stereo fundus image pairs for automated early stage glaucoma assessment** [9038-67]
V. Gatti, J. Hill, S. Mitra, B. Nutter, Texas Tech Univ. (United States)

SESSION 4 FLUIDICS AND VASCULAR

- 9038 OI **Graph-based retrospective 4D image construction from free-breathing MRI slice acquisitions** [9038-17]
Y. Tong, J. K. Udupa, The Univ. of Pennsylvania (United States); K. C. Ciesielski, The Univ. of Pennsylvania (United States) and West Virginia Univ. (United States); J. M. McDonough, A. Mong, R. M. Campbell, The Children's Hospital of Philadelphia (United States)
- 9038 OJ **Time analysis of aneurysm wall shear stress for both Newtonian and Casson flows from image-based CFD models** [9038-68]
M. A. Castro, Univ. Tecnológica Nacional (Argentina) and Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina); M. C. Ahumada Olivares, Univ. Favaloro (Argentina); C. M. Putman, Texas Neurointerventional Surgery Associates (United States); J. R. Cebal, George Mason Univ. (United States)
- 9038 OK **High-resolution quantitative imaging of subcellular morphology and cell refractometry in a liquid environment via endogenous mechanism** [9038-19]
K. Edward, The Univ. of the West Indies at Mona (Jamaica); F. Farahi, The Univ. of North Carolina at Charlotte (United States)
- 9038 OL **Effect of injection technique on temporal parametric imaging derived from digital subtraction angiography in patient specific phantoms** [9038-20]
C. N. Ionita, V. L. Garcia, D. R. Bednarek, K. V. Snyder, A. H. Siddiqui, E. I. Levy, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9038 OM **Challenges and limitations of patient-specific vascular phantom fabrication using 3D Polyjet printing** [9038-21]
C. N. Ionita, M. Mokin, N. Varble, D. R. Bednarek, J. Xiang, K. V. Snyder, A. H. Siddiqui, E. I. Levy, H. Meng, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9038 ON **Non-invasive computation of aortic pressure maps: a phantom-based study of two approaches** [9038-22]
M. Delles, S. Schalck, Y. Chassein, Karlsruhe Institute of Technology (Germany); T. Müller, German Cancer Research Ctr. (Germany); F. Rengier, German Cancer Research Ctr. (Germany) and Univ. Hospital Heidelberg (Germany); S. Speidel, Karlsruhe Institute of Technology (Germany); H. von Tengg-Kobligh, German Cancer Research Ctr. (Germany), Univ. Hospital Heidelberg (Germany), and Univ. Hospital of Bern (Switzerland); H.-U. Kauczor, Univ. Hospital Heidelberg (Germany); R. Dillmann, R. Unterhinninghofen, Karlsruhe Institute of Technology (Germany)

SESSION 5 MYOCARDIAL FUNCTION

- 9038 0O **Dynamic CT myocardial perfusion imaging: detection of ischemia in a porcine model with FFR verification** [9038-23]
R. Fahmi, B. L. Eck, Case Western Reserve Univ. (United States); M. Vembar, Philips Healthcare (United States); H. G. Bezerra, Harrington Heart & Vascular Institute, Univ. Hospitals of Cleveland (United States); D. L. Wilson, Case Western Reserve Univ. (United States)
- 9038 0P **Parametric myocardial perfusion PET imaging using physiological clustering** [9038-24]
H. Mohy-ud-Din, N. A. Karakatsanis, M. A. Lodge, Johns Hopkins Univ. (United States); J. Tang, Oakland Univ. (United States); A. Rahmim, Johns Hopkins Univ. (United States)

SESSION 6 KEYNOTE AND MOLECULAR IMAGING

- 9038 0R **Complementary tumor vascularity imaging in a single PET-CT routine using FDG early dynamic blood flow and contrast-enhanced CT texture analysis** [9038-26]
R. Carmi, Philips Healthcare (Israel); N. Yefremov, Rabin Medical Ctr. (Israel) and Assuta Medical Ctr. (Israel); H. Bernstein, Rabin Medical Ctr. (Israel) and Tel Aviv Univ. (Israel); D. Groshar, Rabin Medical Ctr. (Israel), Tel Aviv Univ. (Israel), and Assuta Medical Ctr. (Israel)

SESSION 7 LUNG

- 9038 0T **Early prediction of lung cancer recurrence after stereotactic radiotherapy using second order texture statistics** [9038-28]
S. A. Mattonen, The Univ. of Western Ontario (Canada); D. A. Palma, The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada); C. J. A. Haasbeek, S. Senan, Vrije Univ. Medical Ctr. (Netherlands); A. D. Ward, The Univ. of Western Ontario (Canada)
- 9038 0U **Dual-energy micro-CT imaging of pulmonary airway obstruction: correlation with micro-SPECT** [9038-29]
C. T. Badea, N. Befera, D. Clark, Y. Qi, G. A. Johnson, Duke Univ. Medical Ctr. (United States)
- 9038 0V **Single-shot X-ray measurement of alveolar size distributions** [9038-30]
R. P. Carnibella, M. J. Kitchen, A. Fouras, Monash Univ. (Australia)
- 9038 0W **Investigation of pulmonary acoustic simulation: comparing airway model generation techniques** [9038-31]
B. Henry, Z. Dai, Y. Peng, Univ. of Illinois at Chicago (United States); H. A. Mansy, Rush Univ. Medical Ctr. (United States) and Univ. of Central Florida (United States); R. H. Sandler, Nemour's Childrens Hospital (United States); T. Royston, Univ. of Illinois at Chicago (United States)

- 9038 OX **Automated lung segmentation of low resolution CT scans of rats** [9038-32]
B. M. Rizzo, Marquette Univ. (United States); S. T. Haworth, Zablocki Veterans Affairs Medical Ctr. (United States) and Medical College of Wisconsin (United States); A. V. Clough, Marquette Univ. (United States), Zablocki Veterans Affairs Medical Ctr. (United States), and Medical College of Wisconsin (United States)
- 9038 OY **Development and application of pulmonary structure-function registration methods: towards pulmonary image-guidance tools for improved airway targeted therapies and outcomes** [9038-70]
F. Guo, D. Pike, S. Svenningsen, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); H. O. Coxson, Vancouver General Hospital (Canada) and James Hogg Research Ctr., Univ. of British Columbia (Canada); J. J. Drozd, J. Yuan, Robarts Research Institute (Canada); A. Fenster, G. Parraga, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)
- 9038 OZ **A novel non-registration based segmentation approach of 4D dynamic upper airway MR images: minimally interactive fuzzy connectedness** [9038-34]
Y. Tong, J. K. Udupa, D. Odhner, The Univ. of Pennsylvania Health System (United States); S. Sin, Children's Hospital at Montefiore, Albert Einstein College of Medicine (United States); M. E. Wagshul, Albert Einstein College of Medicine (United States); R. Arens, Children's Hospital at Montefiore, Albert Einstein College of Medicine (United States)

SESSION 8 BONE

- 9038 10 **Predicting the biomechanical strength of proximal femur specimens with Minkowski functionals and support vector regression** [9038-35]
C.-C. Yang, M. B. Nagarajan, M. B. Huber, Univ. of Rochester Medical Ctr. (United States); J. Carballido-Gamio, Univ. of California, San Francisco (United States); J. S. Bauer, T. Baum, Technical Univ. of Munich (Germany); F. Eckstein, E.-M. Lochmüller, Paracelsus Medical Univ. Salzburg (Austria); T. M. Link, Univ. of California, San Francisco (United States); A. Wismüller, Univ. of Rochester Medical Ctr. (United States)
- 9038 11 **Phase contrast imaging X-ray computed tomography: quantitative characterization of human patellar cartilage matrix with topological and geometrical features** [9038-36]
M. B. Nagarajan, Univ. of Rochester Medical Ctr. (United States); P. Coan, Ludwig-Maximilians-Univ. München (Germany) and European Synchrotron Radiation Facility (France); M. B. Huber, Univ. of Rochester Medical Ctr. (United States); P. C. Diemoz, Ludwig-Maximilians-Univ. München (Germany) and European Synchrotron Radiation Facility (France); A. Wismüller, Univ. of Rochester Medical Ctr. (United States) and Ludwig-Maximilians-Univ. München (Germany)
- 9038 12 **Bone vascularization: a way to study bone microarchitecture?** [9038-37]
P. Blery, IRCCyN, CNRS, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France) and LIOAD-INSERM, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France); F. Autrusseau, IRCCyN, CNRS, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France); E. Crauste, E. Freuchet, IRCCyN, CNRS, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France) and LIOAD-INSERM, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France); P. Weiss, LIOAD-INSERM, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France); J.-P. Guédon, IRCCyN, CNRS, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France); Y. Amouria, IRCCyN, CNRS, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France) and LIOAD-INSERM, L'Univ. Nantes Angers Le Mans, Univ. de Nantes (France)

- 9038 13 **Automatic classification of squamosal abnormality in micro-CT images for the evaluation of rabbit fetal skull defects using active shape models** [9038-38]
A. Chen, B. Dogdas, S. Mehta, A. Bagchi, L. D. Wise, C. T. Winkelmann, Merck Research Labs. (United States)
- 9038 14 **Automated segmentation of knee and ankle regions of rats from CT images to quantify bone mineral density for monitoring treatments of rheumatoid arthritis** [9038-39]
F. Cruz, R. Sevilla, J. Zhu, A. Vanko, J. H. Lee, B. Dogdas, W. Zhang, Merck Research Labs. (United States)

SESSION 9 MICROENVIRONMENT AND MAGNETIC PARTICLE IMAGING

- 9038 15 **Hybrid framework based on evidence theory for blood cell image segmentation** [9038-40]
I. Baghli, Lab. GBM, Univ. Abou Bekr Belkaid Tlemcen (Algeria); A. Nakib, E. Sellam, Lab. LISSI, Univ. Paris-Est Créteil Val de Marne (France); M. Benazzouz, A. Chikh, Lab. GBM, Univ. Abou Bekr Belkaid Tlemcen (Algeria); E. Petit, Lab. LISSI, Univ. Paris-Est Créteil Val de Marne (France)
- 9038 16 **On the way to a patient table integrated scanner system in magnetic particle imaging** [9038-41]
C. Kaethner, M. Ahlborg, K. Gräfe, G. Bringout, Univ. of Lübeck (Germany); T. F. Sattel, Philips Medical Systems DMC GmbH (Germany); T. M. Buzug, Univ. of Lübeck (Germany)
- 9038 18 **A preliminary evaluation of self-made nanobubble in contrast-enhanced ultrasound imaging** [9038-43]
C. Li, K. Wu, J. Li, H. Liu, Q. Zhou, M. Ding, Huazhong Univ. of Science and Technology (China)
- 9038 19 **Quantum dot-sized organic fluorescent dots for long-term cell tracing** [9038-44]
K. Li, Institute of Materials Research and Engineering (Singapore); B. Z. Tang, Hong Kong Univ. of Science and Technology (Hong Kong, China); B. Liu, Institute of Materials Research and Engineering (Singapore) and National Univ. of Singapore (Singapore)
- 9038 1A **Robust material decomposition for spectral CT** [9038-45]
D. P. Clark, G. A. Johnson, C. T. Badea, Duke Univ. Medical Ctr. (United States)

SESSION 10 MR ELASTOGRAPHY

- 9038 1E **MRE detection of heterogeneity using quantitative measures of residual error and uncertainty** [9038-49]
R. J. Okamoto, Washington Univ. in St. Louis (United States); C. L. Johnson, Univ. of Illinois at Urbana-Champaign (United States); Y. Feng, Washington Univ. School of Medicine (United States); J. G. Georgiadis, Univ. of Illinois at Urbana-Champaign (United States); P. V. Bayly, Washington Univ. in St. Louis (United States)
- 9038 1F **Utilizing a reference material for assessing absolute tumor mechanical properties in modality independent elastography** [9038-50]
D. K. Kim, J. A. Weis, T. E. Yankeelov, M. I. Miga, Vanderbilt Univ. (United States)

SESSION 11 BREAST

- 9038 1G **Method and device for intraoperative imaging of lumpectomy specimens to provide feedback to breast surgeon for prompt re-excision during the same procedure** [9038-51]
A. Krol, S. Hemingway, K. Kort, G. de la Rosa, R. Adhikary, D. Masrani, D. Feiglin, SUNY Upstate Medical Univ. (United States); A. O'Connell, M. Nagarajan, C.-C. Yang, A. Wismüller, Univ. of Rochester Medical Ctr. (United States)
- 9038 1H **Ameliorating mammograms by using novel image processing algorithms** [9038-52]
A. Pillai, D. Kwartowitz, Clemson Univ. (United States)
- 9038 1I **Validation and reproducibility assessment of modality independent elastography in a pre-clinical model of breast cancer** [9038-53]
J. A. Weis, D. K. Kim, T. E. Yankeelov, M. I. Miga, Vanderbilt Univ. (United States)
- 9038 1J **Opto-acoustic breast imaging with co-registered ultrasound** [9038-54]
J. Zalev, B. Clingman, D. Herzog, T. Miller, A. T. Stavros, Seno Medical Instruments, Inc. (United States); A. Oraevsky, TomoWave Labs., Inc. (United States); K. Kist, N.-C. Dornbluth, P. Otto, The Univ. of Texas Health Science Ctr. at San Antonio (United States)

POSTER SESSION

- 9038 1K **A statistical model for 3D segmentation of retinal choroid in optical coherence tomography images** [9038-16]
F. Ghasemi, H. Rabbani, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of)
- 9038 1L **Model-based motion correction of reduced field of view diffusion MRI data** [9038-55]
J. Hering, German Cancer Research Ctr. (Germany) and Mannheim Univ. of Applied Sciences (Germany); I. Wolf, Mannheim Univ. of Applied Sciences (Germany) and German Cancer Research Ctr. (Germany); H.-P. Meinzer, German Cancer Research Ctr. (Germany); K. H. Maier-Hein, German Cancer Research Ctr. (Germany) and Mannheim Univ. of Applied Sciences (Germany)
- 9038 1M **A fully automatic unsupervised segmentation framework for the brain tissues in MR images** [9038-56]
Q. Mahmood, A. Chodorowski, Chalmers Univ. of Technology (Sweden) and Sahlgrenska Univ. Hospital (Sweden); B. Ehteshami Bejnordi, Radboud Univ. Medical Ctr. (Netherlands); M. Persson, Chalmers Univ. of Technology (Sweden) and Sahlgrenska Univ. Hospital (Sweden)
- 9038 1O **Is there more valuable information in PWI datasets for a voxel-wise acute ischemic stroke tissue outcome prediction than what is represented by typical perfusion maps?** [9038-58]
N. D. Forkert, S. Siemonsen, M. Dalski, T. Verleger, A. Kemmling, J. Fiehler, Univ. Medical Ctr. Hamburg-Eppendorf (Germany)
- 9038 1P **Cortical thinning in cognitively normal elderly cohort of 60 to 89 year old from AIBL database and vulnerable brain areas** [9038-59]
Z. S. Lin, G. Avinash, L. Yan, K. McMillan, GE Healthcare (United States)

- 9038 1Q **Characterizing the spatial distribution of microhemorrhages resulting from Traumatic Brain Injury (TBI)** [9038-60]
N. Li, Y.-Y. Chou, N. Shiee, Ctr. for Neuroscience and Regenerative Medicine (United States); L. Chan, National Institutes of Health (United States); D. L. Pham, Ctr. for Neuroscience and Regenerative Medicine (United States); J. A. Butman, Ctr. for Neuroscience and Regenerative Medicine (United States) and National Institutes of Health (United States)
- 9038 1R **Pair-wise clustering of large scale Granger causality index matrices for revealing communities** [9038-61]
A. Wismüller, M. B. Nagarajan, Univ. of Rochester Medical Ctr. (United States); H. Witte, B. Pester, L. Leistritz, Jena Univ. Hospital (Germany) and Friedrich Schiller Univ. Jena (Germany)
- 9038 1S **Automated segmentation of corticospinal tract in diffusion tensor images via multi-modality multi-atlas fusion** [9038-62]
X. Tang, Johns Hopkins Univ. (United States); S. Mori, Johns Hopkins Univ. School of Medicine (United States); M. I. Miller, Johns Hopkins Univ. (United States)
- 9038 1T **Metastatic brain cancer: prediction of response to whole-brain helical tomotherapy with simultaneous intralesional boost for metastatic disease using quantitative MR imaging features** [9038-63]
H. Sharma, G. Bauman, G. Rodrigues, R. Bartha, A. Ward, Robarts Research Institute, The Univ. of Western Ontario (Canada)
- 9038 1U **Novel T lymphocyte proliferation assessment using whole mouse cryo-imaging (Cum Laude Poster Award)** [9038-64]
P. Wuttisanwattana, Case Western Reserve Univ. (United States); S. A. Raza, COMSATS Institute of Information Technology (Pakistan); S. Eid, National Ctr. for Stem Cell & Regenerative Medicine (United States); K. R. Cooke, Johns Hopkins Univ. (United States); D. L. Wilson, Case Western Reserve Univ. (United States), Univ. Hospitals, Cleveland (United States), and BioInVision Inc. (United States)
- 9038 1W **Comparison of macular OCTs in right and left eyes of normal people** [9038-66]
T. Mahmudi, R. Kafieh, H. Rabbani, A. Mehri dehnavi, M. Akhlagi, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of)
- 9038 1X **Towards a myocardial contraction force reconstruction technique for heart disease assessment and therapy planning** [9038-69]
S. M. H. Haddad, The Univ. of Western Ontario (Canada); M. Drangova, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); J. A. White, The Univ. of Western Ontario (Canada); A. Samani, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada)
- 9038 1Y **Setting ventilation parameters guided by electrical impedance tomography in an animal trial of acute respiratory distress syndrome** [9038-71]
M. Czaplík, Univ. Hospital RWTH Aachen (Germany) and RWTH Aachen Univ. (Germany); I. Biener, Univ. Hospital RWTH Aachen (Germany); S. Leonhardt, RWTH Aachen Univ. (Germany); R. Rossaint, Univ. Hospital RWTH Aachen (Germany)

- 9038 17 **Accurate 3D kinematic measurement of temporomandibular joint using X-ray fluoroscopic images** [9038-72]
T. Yamazaki, Osaka Univ. (Japan); A. Matsumoto, Osaka Univ. Dental Hospital (Japan); K. Sugamoto, Osaka Univ. Graduate School of Medicine (Japan); K. Matsumoto, Osaka Univ. Graduate School of Dentistry (Japan); N. Kakimoto, Osaka Univ. Dental Hospital (Japan); Y. Yura, Osaka Univ. Graduate School of Dentistry (Japan)
- 9038 20 **Using anisotropic 3D Minkowski functionals for trabecular bone characterization and biomechanical strength prediction in proximal femur specimens** [9038-73]
M. B. Nagarajan, T. De, Univ. of Rochester Medical Ctr. (United States); E.-M. Lochmüller, F. Eckstein, Paracelsus Medical Univ. Salzburg (Austria); A. Wismüller, Univ. of Rochester Medical Ctr. (United States)
- 9038 22 **Investigating the use of texture features for analysis of breast lesions on contrast-enhanced cone beam CT** [9038-75]
X. Wang, M. B. Nagarajan, Univ. of Rochester Medical Ctr. (United States); D. Conover, R. Ning, Univ. of Rochester Medical Ctr. (United States) and Koning Corp. (United States); A. O'Connell, A. Wismüller, Univ. of Rochester Medical Ctr. (United States)
- 9038 23 **A registration-based segmentation method with application to adiposity analysis of mice microCT images** [9038-76]
B. Bai, A. Joshi, S. Brandhorst, V. D. Longo, P. S. Conti, R. M. Leahy, Univ. of Southern California (United States)
- 9038 24 **Relationship of ultrasound signal intensity with SonoVue concentration at body temperature in vitro** [9038-77]
X. Yang, Huazhong Univ. of Science and Technology (China) and Sun Yat-Sen Univ. Cancer Ctr. (China); J. Li, Huazhong Univ. of Science and Technology (China) and Qingdao Hisense R&D Ctr. (China); X. He, Univ. Hospital, China Univ. of Geosciences (China); K. Wu, Y. Yuan, M. Ding, Huazhong Univ. of Science and Technology (China)
- 9038 25 **A random walk-based method for segmentation of intravascular ultrasound images** [9038-78]
J. Yan, Shanghai Medical Instrumentation College (China) and Shanghai Dian Ji Univ. (China); H. Liu, Shanghai Medical Instrumentation College (China); Y. Cui, Suzhou Institute of Biomedical Engineering and Technology (China)

Author Index

Conference Committee

Symposium Chairs

Ehsan Samei, Duke University (United States)
David Manning, Lancaster University (United Kingdom)

Conference Chairs

Robert C. Molthen, Medical College of Wisconsin (United States)
John B. Weaver, Dartmouth Hitchcock Medical Center
(United States)

Conference Program Committee

Amir A. Amini, University of Louisville (United States)
Thorsten M. Buzug, Universität zu Lübeck (Germany)
Juan R. Cebral, George Mason University (United States)
Yu Chen, University of Maryland, College Park (United States)
Anne Clough, Marquette University (United States)
Alejandro F. Frangi, The University of Sheffield (United Kingdom)
Barjor Gimi, Geisel School of Medicine (United States)
Andreas H. Hielscher, Columbia University (United States)
Xiaoping P. Hu, Emory University (United States)
Xavier Intes, Rensselaer Polytechnic Institute (United States)
Andrzej Krol, SUNY Upstate Medical University (United States)
John F. LaDisa, Marquette University (United States)
Armando Manduca, Mayo Clinic College of Medicine (United States)
Erik Leo Ritman, Mayo Clinic College of Medicine (United States)
Merryn H. Tawhai, The University of Auckland (New Zealand)
Nicholas J. Tustison, University of Virginia (United States)
Axel Wismüller, University of Rochester Medical Center (United States)

Session Chairs

- 1 General MR Techniques
Barjor Gimi, Dartmouth Hitchcock Medical Center (United States)
Alejandro F. Frangi, The University of Sheffield (United Kingdom)
- 2 fMRI and Brain
Nicholas J. Tustison, University of Virginia (United States)
Barjor Gimi, Dartmouth Hitchcock Medical Center (United States)
- 3 Optical Coherence Tomography
Mona K. Garvin, The University of Iowa (United States)

- 4 Fluidics and Vascular
 Amir A. Amini, University of Louisville (United States)
 Robert C. Molthen, Medical College of Wisconsin (United States)
- 5 Myocardial Function
 Armando Manduca, Mayo Clinic College of Medicine (United States)
- 6 Keynote and Molecular Imaging
 Robert C. Molthen, Medical College of Wisconsin (United States)
 John B. Weaver, Dartmouth Hitchcock Medical Center
 (United States)
- 7 Lung
 Robert C. Molthen, Medical College of Wisconsin (United States)
- 8 Bone
 Erik L. Ritman, Mayo Clinic College of Medicine (United States)
 Axel Wismüller, University of Rochester Medical Center
 (United States)
- 9 Microenvironment and Magnetic Particle Imaging
 John B. Weaver, Dartmouth Hitchcock Medical Center
 (United States)
- 10 MR Elastography
 Armando Manduca, Mayo Clinic College of Medicine
 (United States)
 John B. Weaver, Dartmouth Hitchcock Medical Center
 (United States)
- 11 Breast
 Axel Wismüller, University of Rochester Medical Center
 (United States)
 Armando Manduca, Mayo Clinic College of Medicine
 (United States)
- 12 Ultrasound Elastography: Joint Session with Conference 9040
 John B. Weaver, Dartmouth Hitchcock Medical Center
 (United States)
 Marvin M. Doyley, University of Rochester (United States)
- Poster Session
 Xavier Intes, Rensselaer Polytechnic Institute (United States)
 Andrzej Krol, SUNY Upstate Medical University (United States)

Introduction

The Biomedical Applications in Molecular, Structural, and Functional Imaging Conference held at the Town & Country Resort and Convention Center in San Diego, California was another great success. Chairs Robert Molthen and John Weaver welcomed Simon Cherry from UC Davis, a brilliant, high caliber expert in the field of Technology Development in Molecular and Genomic Imaging, for the Keynote entitled, 'Advancing technologies for preclinical molecular imaging'. Dr. Cherry's talk included new detector technology, optical imaging of radiotracers via Cerenkov luminescence, high sensitivity single photon imaging without the use of any physical collimation, and views of many opportunities for clinical translation. Mohammed Farhoud and Melissa Moore from Sofie Biosciences presented the conference workshop entitled 'The Evolution of Preclinical Molecular Imaging' which included a great overview and specific details of preclinical imaging modalities, practical laboratory knowledge, as well as a preview of a small desktop cassette based microfluidic synthesizer being developed by Sofie, likely to be groundbreaking and revolutionize research-based molecular imaging projects.

Pleasant weather and friendly, sunny skies warmed the outdoor lunches and conversations that intermingled with the scientific sessions which included General MR Techniques, fMRI and Brain, Optical Coherence Tomography, Fluidics and Vascular, Myocardial Function (a joint session and Keynote entitled 'Noninvasive Functional Assessment of Coronary Artery Disease using Cardiac CT Imaging and Computational Fluid Dynamics' with the Physics of Medical Imaging Conference), Molecular Imaging, Lung, Bone, Microenvironment and Magnetic Particle Imaging, MR Elastography, Breast, and Ultrasound Elastography (a joint session with the Ultrasonic Imaging and Tomography Conference). The Biomedical Applications conference also had a lively poster session with notable works including: 'Novel T lymphocyte proliferation assay using whole mouse cryo imaging' by Patiwet Wuttisarnwattana at Case Western Reserve University (USA), 'Accurate 3D kinematic measurement of temporomandibular joint using X-ray fluoroscopic images', by Takaharu Yamazaki at the Graduate School of Medicine, FOM (Japan), and 'Characterizing the spatial distribution of micro-hemorrhages resulting from traumatic brain injury (TBI)' by Ningzhi Li at the National Institutes of Health (USA), getting the highest scores from the judging committee.

Robert C. Molthen
John B. Weaver

Awards

Robert F. Wagner Award

Robert F. Wagner was an active scientist in the SPIE Medical Imaging meeting, starting with the first meeting in 1972 and continuing throughout his career. He ensured that the BRH, and subsequently the CDRH, was a sponsor for the early and subsequent Medical Imaging meetings, helping to launch and ensure the historical success of the meeting. The Robert F. Wagner All-Conference Best Student Paper Award (established 2014) is acknowledgment of his many important contributions to the Medical Imaging meeting and his many important advances to the field of medical imaging.

Sponsored by:

The Medical Image Perception Society

SPIE®

2014 Recipients:

First Place: **MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression** (9035-78)

A. Martínez-Torteya, J. A. Rodríguez-Rojas, J. M. Celaya-Padilla, J. I. Galván-Tejada, V. M. Treviño-Alvarado, Sr., J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

Second Place: **Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation** (9036-49)

G. Litjens, H. Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); R. Elliot, Case Western Reserve Univ. (United States); N. Shih, M. Feldman, Univ. of Pennsylvania (United States); S. Viswanath, Case Western Reserve Univ. (United States); J. Futterer, J. Bomers, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); A. Madabhushi, Case Western Reserve Univ. (United States)