PROCEEDINGS OF SPIE

[SPIDigitalLibrary.org/conference-proceedings-of-spie](https://spiedigitallibrary.org/conference-proceedings-of-spie)

Front Matter: Volume 9034

, "Front Matter: Volume 9034," Proc. SPIE 9034, Medical Imaging 2014:
Image Processing, 903401 (25 April 2014); doi: 10.1117/12.2052780

SPIE.

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

Medical Imaging 2014

Image Processing

Sebastien Ourselin

Martin A. Styner

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 9034

Proceedings of SPIE, 1605-7422, V. 9034

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

Medical Imaging 2014: Image Processing, edited by Sebastien Ourselin,

Martin A. Styner, Proc. of SPIE Vol. 9034, 903401 • © 2014 SPIE

CCC code: 1605-7422/14/\$18 • doi: 10.1117/12.2052780

Proc. of SPIE Vol. 9034 903401-1

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: Image Processing*, edited by Sebastien Ourselin, Martin A. Styner, Proceedings of SPIE Vol. 9034 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 1605-7422

ISBN: 9780819498274

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

xxi	Conference Committee
xxv	2014 Medical Imaging Paper Award Recipients

Part One

SESSION 1	OCT AND ULTRASOUND
9034 02	An adaptive grid for graph-based segmentation in retinal OCT [9034-1] A. Lang, A. Carass, Johns Hopkins Univ. (United States); P. A. Calabresi, H. S. Ying, Johns Hopkins Univ. School of Medicine (United States); J. L. Prince, Johns Hopkins Univ. (United States)
9034 03	Automated vessel shadow segmentation of fovea-centered spectral-domain images from multiple OCT devices [9034-2] J. Wu, B. S. Gerendas, S. M. Waldstein, C. Simader, U. Schmidt-Erfurth, Medical Univ. of Vienna (Austria)
9034 04	Locally constrained active contour: a region-based level set for ovarian cancer metastasis segmentation [9034-158] J. Liu, J. Yao, S. Wang, National Institutes of Health Clinical Ctr. (United States); M. G. Linguraru, Children's National Medical Ctr. (United States); R. M. Summers, National Institutes of Health Clinical Ctr. (United States)
9034 05	Automatic nipple detection on 3D images of an automated breast ultrasound system (ABUS) [9034-4] M. Javanshir Moghaddam, T. Tan, N. Karssemeijer, B. Platel, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
9034 06	Cancer therapy prognosis using quantitative ultrasound spectroscopy and a kernel-based metric [9034-5] M. J. Gangeh, Univ. of Toronto (Canada) and Sunnybrook Health Sciences Ctr. (Canada); A. Hashim, A. Giles, Sunnybrook Health Sciences Ctr. (Canada); G. J. Czarnota, Univ. of Toronto (Canada) and Sunnybrook Health Sciences Ctr. (Canada)
SESSION 2	SEGMENTATION
9034 07	Multi-scale feature learning on pixels and super-pixels for seminal vesicles MRI segmentation [9034-6] Q. Gao, A. Asthana, T. Tong, D. Rueckert, P. E. Edwards, Imperial College London (United Kingdom)

- 9034 08 **Failure analysis for model-based organ segmentation using outlier detection** [9034-7]
A. Saalbach, I. Wächter Stehle, C. Lorenz, J. Weese, Philips Technologie GmbH (Germany)
- 9034 09 **Brain abnormality segmentation based on L_1 -norm minimization** [9034-8]
K. Zeng, G. Erus, M. Tanwar, C. Davatzikos, Univ. of Pennsylvania (United States)
- 9034 0A **Towards a comprehensive CT image segmentation for thoracic organ radiation dose estimation and reporting** [9034-9]
C. Lorenz, H. Ruppertshofen, T. Vik, Philips Research Labs. (Germany); P. Prinsen, J. Wiegert, Philips Research Labs. (Netherlands)
- 9034 0B **Neuromuscular fiber segmentation through particle filtering and discrete optimization** [9034-10]
T. Dietenbeck, CREATIS, CNRS, Univ. de Lyon (France) and Czech Technical Univ. in Prague (Czech Republic); F. Varray, CREATIS, CNRS, Univ. de Lyon (France); J. Kybic, Czech Technical Univ. in Prague (Czech Republic); O. Basset, C. Cachard, CREATIS, CNRS, Univ. de Lyon (France)
- 9034 0C **Prostate segmentation in MRI using fused T2-weighted and elastography images** [9034-11]
G. Nir, R. S. Sahebjavaheer, The Univ. of British Columbia (Canada); A. Baghani, Ultrasonix Medical Corp. (Canada); R. Sinkus, King's College London (United Kingdom); S. E. Salcudean, The Univ. of British Columbia (Canada)

SESSION 3 TEMPORAL AND MOTION ANALYSIS

- 9034 0D **Characterizing growth patterns in longitudinal MRI using image contrast** [9034-12]
A. Vardhan, M. Prastawa, C. Vachet, The Univ. of Utah (United States); J. Piven, The Univ. of North Carolina at Chapel Hill (United States); G. Gerig, The Univ. of Utah (United States)
- 9034 0E **Registration of organs with sliding interfaces and changing topologies** [9034-13]
F. F. Berendsen, A. N. T. J. Kotte, M. A. Viergeever, J. P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands)
- 9034 0F **Elastic registration of prostate MR images based on state estimation of dynamical systems** [9034-14]
B. Marami, Robarts Research Institute (Canada), The Univ. of Western Ontario (Canada), and McMaster Univ. (Canada); S. Ghoul, Robarts Research Institute (Canada); S. Sirouspour, McMaster Univ. (Canada); D. W. Capson, Univ. of Victoria (Canada); S. R. H. Davidson, Ontario Cancer Institute (Canada); J. Trachtenberg, Univ. Health Network (Canada); A. Fenster, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)
- 9034 0G **A hybrid biomechanical model-based image registration method for sliding objects** [9034-15]
L. Han, D. Hawkes, D. Barratt, Univ. College London (United Kingdom)
- 9034 0H **Real-time intensity based 2D/3D registration using kV-MV image pairs for tumor motion tracking in image guided radiotherapy** [9034-16]
H. Furtado, E. Steiner, M. Stock, D. Georg, W. Birkfellner, Medical Univ. of Vienna (Austria)

SESSION 4 CARDIAC AND VASCULAR IMAGING

- 9034 0I **Automated epicardial fat volume quantification from non-contrast CT** [9034-17]
X. Ding, Cedars-Sinai Medical Ctr. (United States) and Univ. of California, Los Angeles (United States); D. Terzopoulos, Univ. of California, Los Angeles (United States); M. Diaz-Zamudio, Cedars Sinai Medical Ctr. (United States); D. S. Berman, P. J. Slomka, D. Dey, Cedars-Sinai Medical Ctr. (United States) and Univ. of California, Los Angeles (United States)
- 9034 0J **Blood flow quantification using optical flow methods in a body fitted coordinate system** [9034-18]
P. Maday, R. Brosig, Technische Univ. München (Germany); J. Endres, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); M. Kowarschik, Siemens AG (Germany); N. Navab, Technische Univ. München (Germany)
- 9034 0K **3D geometric analysis of the aorta in 3D MRA follow-up pediatric image data** [9034-19]
S. Wörz, A. Alrajab, R. Arnold, J. Eichhorn, Univ. of Heidelberg (Germany); H. von Tengg-Kobligh, Univ. of Heidelberg (Germany) and Univ. Bern (Switzerland); J.-P. Schenk, K. Rohr, Univ. of Heidelberg (Germany)
- 9034 0L **Tensor-based tracking of the aorta in phase-contrast MR images** [9034-20]
Y.-J. Azad, A. Malsam, Karlsruhe Institute of Technology (Germany); S. Ley, Univ. Hospital Heidelberg (Germany) and Surgical Hospital Dr. Rinecker (Germany); F. Rengier, Univ. Hospital Heidelberg (Germany) and German Cancer Research Ctr. (Germany); R. Dillmann, R. Unterhinninghofen, Karlsruhe Institute of Technology (Germany)
- 9034 0M **Joint multi-object registration and segmentation of left and right cardiac ventricles in 4D cine MRI** [9034-21]
J. Ehrhardt, T. Kepp, Univ. of Lübeck (Germany); A. Schmidt-Richberg, Imperial College London (United Kingdom); H. Handels, Univ. of Lübeck (Germany)
- 9034 0N **Nonrigid motion compensation in B-mode and contrast enhanced ultrasound image sequences of the carotid artery** [9034-22]
D. D. B. Carvalho, Z. Akkus, J. G. Bosch, S. C. H. van den Oord, Erasmus MC (Netherlands); W. J. Niessen, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands); S. Klein, Erasmus MC (Netherlands)

SESSION 5 DTI

- 9034 0O **Influence of image registration on ADC images computed from free-breathing diffusion MRIs of the abdomen** [9034-23]
J.-M. Guyader, Erasmus MC (Netherlands); L. Bernardin, N. H. M. Douglas, The Institute of Cancer Research (United Kingdom) and Royal Marsden Hospital (United Kingdom); D. H. J. Poot, Erasmus MC (Netherlands); W. J. Niessen, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands); S. Klein, Erasmus MC (Netherlands)
- 9034 0P **A new method for joint susceptibility artefact correction and super-resolution for dMRI** [9034-24]
L. Ruthotto, The Univ. of British Columbia (Canada); S. Mohammadi, N. Weiskopf, Univ. College London (United Kingdom)

- 9034 OQ **A dual spherical model for multi-shell diffusion imaging** [9034-25]
Y. Rath, Harvard Medical School (United States); O. Michailovich, Univ. of Waterloo (Canada); K. Setsompop, C.-F. Westin, Harvard Medical School (United States)
- 9034 OR **Multi-modal pharmacokinetic modelling for DCE-MRI: using diffusion weighted imaging to constrain the local arterial input function** [9034-26]
V. Hamy, M. Modat, R. Shipley, N. Dikaios, J. Cleary, S. Punwani, S. Ourselin, D. Atkinson, A. Melbourne, Univ. College London (United Kingdom)
- 9034 OS **Intramycellular lipid dependence on skeletal muscle fiber type and orientation characterized by diffusion tensor imaging and ¹H-MRS** [9034-27]
S. K. Valaparla, F. Gao, M. Abdul-Ghani, G. D. Clarke, The Univ. of Texas Health Science Ctr. at San Antonio (United States)

SESSION 6 SHAPE

- 9034 OT **A statistical shape+pose model for segmentation of wrist CT images** [9034-28]
E. M. A. Anas, A. Rasouljan, Univ. of British Columbia (Canada); P. St. John, D. Pichora, Kingston General Hospital (Canada); R. Rohling, P. Abolmaesumi, Univ. of British Columbia (Canada)
- 9034 OU **Statistical shape and appearance models without one-to-one correspondences** [9034-97]
J. Ehrhardt, J. Krüger, H. Handels, Univ. of Lübeck (Germany)
- 9034 OV **A framework for joint image-and-shape analysis** [9034-30]
Y. Gao, The Univ. of Alabama at Birmingham (United States); A. Tannenbaum, Stony Brook Univ. (United States); S. Bouix, Harvard Medical School (United States)
- 9034 OW **Groupwise shape analysis of the hippocampus using spectral matching** [9034-31]
M. Shakeri, Ecole Polytechnique de Montréal (Canada) and CHU Sainte-Justine Hospital Research Ctr. (Canada); H. Lombaert, McGill Univ. (Canada); S. Lippé, CHU Sainte-Justine Hospital Research Ctr. (Canada) and Univ. de Montréal (Canada); S. Kadoury, Ecole Polytechnique de Montréal (Canada) and CHU Sainte-Justine Hospital Research Ctr. (Canada)
- 9034 OX **3D shape analysis of heterochromatin foci based on a 3D spherical harmonics intensity model** [9034-32]
S. Eck, S. Wörz, K. Müller-Ott, Univ. of Heidelberg (Germany) and German Cancer Research Ctr. (Germany); M. Hahn, G. Schotta, Ludwig-Maximilians-Univ. München (Germany); K. Rippe, K. Rohr, Univ. of Heidelberg (Germany) and German Cancer Research Ctr. (Germany)
- 9034 OY **Improved statistical power with a sparse shape model in detecting an aging effect in the hippocampus and amygdala** [9034-33]
M. K. Chung, Univ. of Wisconsin-Madison (United States); S.-G. Kim, Max Planck Institute (Germany); S. M. Schaefer, Univ. of Wisconsin-Madison (United States); C. M. van Reekum, The Univ. of Reading (United Kingdom); L. Peschke-Schmitz, Univ. of Wisconsin-Madison (United States); M. J. Sutterer, Univ. of Iowa (United States); R. J. Davidson, Univ. of Wisconsin-Madison (United States)

SESSION 7 KEYNOTE AND BRAIN

- 9034 0Z **Large scale digital atlases in neuroscience (Keynote Paper)** [9034-34]
M. Hawrylycz, D. Feng, C. Lau, C. Kuan, J. Miller, C. Dang, L. Ng, Allen Institute for Brain Science (United States)
- 9034 10 **Smoothness parameter tuning for generalized hierarchical continuous max-flow segmentation** [9034-35]
J. S. H. Baxter, M. Rajchl, A. J. McLeod, A. R. Khan, J. Yuan, T. M. Peters, Robarts Research Institute (Canada) and Western Univ. (Canada)
- 9034 11 **Bilayered anatomically constrained split-and-merge expectation maximisation algorithm (BiASM) for brain segmentation** [9034-36]
C. H. Sudre, M. J. Cardoso, S. Ourselin, Univ. College London (United Kingdom)
- 9034 12 **Fast CEUS image segmentation based on self organizing maps** [9034-37]
J. Paire, V. Sauvage, A. Albouy-Kissi, ISIT, CNRS, Univ. d'Auvergne (France);
V. Ladam Marcus, C. Marcus, C. Hoeffel, Hospitalise au Chu de Reims (France)

SESSION 8 CLASSIFICATION AND TEXTURE

- 9034 13 **Spectral-spatial classification using tensor modeling for cancer detection with hyperspectral imaging** [9034-38]
G. Lu, Georgia Institute of Technology (United States) and Emory Univ. (United States);
L. Halig, D. Wang, Z. G. Chen, Emory Univ. (United States); B. Fei, Georgia Institute of Technology (United States) and Emory Univ. (United States)
- 9034 14 **Texture feature analysis for prediction of postoperative liver failure prior to surgery** [9034-39]
A. L. Simpson, Vanderbilt Univ. (United States) and Memorial Sloan-Kettering Cancer Ctr. (United States); R. K. Do, Memorial Sloan-Kettering Cancer Ctr. (United States);
E. P. Parada, Pathfinder Therapeutics, Inc. (United States); M. I. Miga, Vanderbilt Univ. (United States); W. R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (United States)
- 9034 15 **Detection and location of 127 anatomical landmarks in diverse CT datasets** [9034-40]
M. A. Dabbah, S. Murphy, H. Pello, R. Courbon, E. Beveridge, S. Wiseman, D. Wyeth, I. Poole, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom)
- 9034 16 **Unsupervised detection of abnormalities in medical images using salient features** [9034-41]
S. Alpert, P. Kisilev, IBM Research Haifa Labs. (Israel)
- 9034 17 **Recognizing surgeon's actions during suture operations from video sequences** [9034-42]
Y. Li, J. Ohya, Waseda Univ. (Japan); T. Chiba, National Ctr. for Child Health and Development (Japan); R. Xu, Waseda Univ. (Japan); H. Yamashita, National Ctr. for Child Health and Development (Japan)

SESSION 9 REGISTRATION

- 9034 19 **MR to CT registration of brains using image synthesis** [9034-44]
S. Roy, Henry M. Jackson Foundation (United States); A. Carass, A. Jog, J. L. Prince, Johns Hopkins Univ. (United States); J. Lee, Johns Hopkins Univ. School of Medicine (United States)
- 9034 1A **Fast automatic estimation of the optimization step size for nonrigid image registration** [9034-45]
Y. Qiao, B. P. F. Lelieveldt, M. Staring, Leiden Univ. Medical Ctr. (Netherlands)
- 9034 1B **Detection and correction of inconsistency-based errors in non-rigid registration** [9034-46]
T. Gass, G. Szekely, O. Goksel, ETH Zurich (Switzerland)
- 9034 1C **A rib-specific multimodal registration algorithm for fused unfolded rib visualization using PET/CT** [9034-47]
J. N. Kaftan, M. Kopaczka, Siemens Molecular Imaging (United Kingdom); A. Wimmer, Siemens Computed Tomography (Germany); G. Platsch, J. Declerck, Siemens Molecular Imaging (United Kingdom)
- 9034 1D **A symmetric block-matching framework for global registration** [9034-48]
M. Modat, D. M. Cash, P. Daga, G. P. Winston, J. S. Duncan, S. Ourselin, Univ. College London (United Kingdom)

SESSION 10 ATLAS-BASED SEGMENTATION

- 9034 1E **Statistical label fusion with hierarchical performance models** [9034-49]
A. J. Asman, A. S. Dagley, B. A. Landman, Vanderbilt Univ. (United States)
- 9034 1F **Applying the algorithm "assessing quality using image registration circuits" (AQUIRC) to multi-atlas segmentation** [9034-50]
R. Datteri, A. J. Asman, B. A. Landman, B. M. Dawant, Vanderbilt Univ. (United States)
- 9034 1G **Robust optic nerve segmentation on clinically acquired CT** [9034-51]
S. Panda, A. J. Asman, M. P. DeLisi, L. A. Mawn, R. L. Galloway, B. A. Landman, Vanderbilt Univ. (United States)
- 9034 1H **Spatially adapted augmentation of age-specific atlas-based segmentation using patch-based priors** [9034-52]
M. Liu, S. Seshamani, L. Harrylock, A. Kitsch, Univ. of Washington (United States); S. Miller, V. Chau, The Hospital for Sick Children (Canada); K. Poskitt, Child & Family Research Institute (Canada); F. Rousseau, ICube, CNRS, Univ. de Strasbourg (France); C. Studholme, Univ. of Washington (United States)
- 9034 1I **Personalized articulated atlas with a dynamic adaptation strategy for bone segmentation in CT or CT/MR head and neck images** [9034-53]
S. Steger, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany); F. Jung, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) and Technische Univ. Darmstadt (Germany); S. Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany)

SESSION 11 MAGNETIC RESONANCE IMAGING

- 9034 1J **Intra voxel analysis in MRI** [9034-54]
M. Ambrosanio, F. Baselice, G. Ferraioli, V. Pascazio, Univ. degli Studi di Napoli Parthenope (Italy)
- 9034 1K **A new application of compressive sensing in MRI** [9034-55]
F. Baselice, G. Ferraioli, Univ. degli Studi di Napoli Parthenope (Italy); F. Lenti, Univ. degli Studi dell'Insubria (Italy); V. Pascazio, Univ. degli Studi di Napoli Parthenope (Italy)
- 9034 1L **Novel MRI-derived quantitative biomarker for cardiac function applied to classifying ischemic cardiomyopathy within a Bayesian rule learning framework** [9034-56]
P. G. Menon, Univ. of Pittsburgh (United States) and Sun Yat-Sen Univ. - Carnegie Mellon Univ. Joint Institute of Engineering (United States); L. Morris, M. Staines, Univ. of Pittsburgh (United States); J. Lima, The Johns Hopkins Hospital (United States); D. C. Lee, Northwestern Univ. (United States); V. Gopalakrishnan, Univ. of Pittsburgh (United States)
- 9034 1M **Correction of dental artifacts within the anatomical surface in PET/MRI using active shape models and k-nearest-neighbors** [9034-57]
C. N. Ladefoged, F. L. Andersen, S. H. Keller, Rigshospitalet (Denmark); T. Beyer, Ctr. for Medical Physics and Biomedical Engineering (Austria); L. Højgaard, Rigshospitalet (Denmark); F. Lauze, Univ. of Copenhagen (Denmark)

POSTER SESSION

- 9034 1N **Computer-aided classification of liver tumors in 3D ultrasound images with combined deformable model segmentation and support vector machine** [9034-3]
M. Lee, J. H. Kim, Seoul National Univ. (Korea, Republic of) and Seoul National Univ. Hospital (Korea, Republic of); M. H. Park, Y.-H. Kim, Y. K. Seong, B. H. Cho, K.-G. Woo, Samsung Advanced Institute of Technology (Korea, Republic of)
- 9034 1O **Sparse appearance model-based algorithm for automatic segmentation and identification of articulated hand bones** [9034-29]
F. A. Reda, Siemens Medical Solutions USA, Inc. (United States) and Vanderbilt Univ. (United States); Z. Peng, S. Liao, Y. Shinagawa, Y. Zhan, G. Hermosillo, X. S. Zhou, Siemens Medical Solutions USA, Inc. (United States)
- 9034 1P **Joint source based analysis of multiple brain structures in studying major depressive disorder** [9034-58]
M. Ramezani, A. Rasouljan, The Univ. of British Columbia (Canada); T. Hollenstein, K. Harkness, I. Johnsrude, Queen's Univ. (Canada); P. Abolmaesumi, The Univ. of British Columbia (Canada)
- 9034 1Q **A multi-view approach to multi-modal MRI cluster ensembles** [9034-59]
C. A. Méndez, Univ. degli Studi di Verona (Italy); P. Summers, European Institute of Oncology (Italy); G. Menegaz, Univ. degli Studi di Verona (Italy)

- 9034 1R **Comparative study of two sparse multinomial logistic regression models in decoding visual stimuli from brain activity of fMRI** [9034-60]
S. Song, G. Chen, Jinan Univ. (China); Y. Zhan, J. Zhang, L. Yao, Beijing Normal Univ. (China)
- 9034 1S **Classification of microscopy images of Langerhans islets** [9034-61]
J. Švihlík, J. Kybic, Czech Technical Univ. in Prague (Czech Republic); D. Habart, Z. Berková, P. Girman, J. Kříž, K. Zacharovová, Institute for Clinical and Experimental Medicine (Czech Republic)
- 9034 1T **Classification of normal and pathological aging processes based on brain MRI morphology measures** [9034-62]
J. L. Perez-Gonzalez, O. Yanez-Suarez, V. Medina-Bañuelos, Univ. Autónoma Metropolitana (Mexico)
- 9034 1U **Support vector machine based IS/OS disruption detection from SD-OCT images** [9034-63]
L. Wang, W. Zhu, Soochow Univ. (China); J. Liao, Joint Shantou International Eye Ctr. (China); D. Xiang, C. Jin, Soochow Univ. (China); H. Chen, Joint Shantou International Eye Ctr. (China); X. Chen, Soochow Univ. (China)
- 9034 1V **Breast tissue classification in digital tomosynthesis images based on global gradient minimization and texture features** [9034-64]
X. Qin, Emory Univ. (United States); G. Lu, Emory Univ. (United States) and Georgia Institute of Technology (United States); I. Sechopoulos, Emory Univ. (United States); B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States)
- 9034 1W **A minimum spanning forest based hyperspectral image classification method for cancerous tissue detection** [9034-65]
R. Pike, S. K. Patton, Emory Univ. (United States); G. Lu, Georgia Institute of Technology (United States) and Emory Univ. (United States); L. V. Halig, D. Wang, Z. G. Chen, Emory Univ. (United States); B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States)
- 9034 1X **Protein crystallization image classification with elastic net** [9034-66]
J. Hung, J. Collins, M. Weldetsion, O. Newland, E. Chiang, San Francisco State Univ. (United States); S. Guerrero, Genentech Inc. (United States); K. Okada, San Francisco State Univ. (United States)
- 9034 1Y **Example based lesion segmentation** [9034-67]
S. Roy, Q. He, Henry M. Jackson Foundation (United States); A. Carass, A. Jog, Johns Hopkins Univ. (United States); J. L. Cuzzocreo, Johns Hopkins Univ. School of Medicine (United States); D. S. Reich, National Institute of Neurological Disorders and Stroke (United States); J. Prince, Johns Hopkins Univ. (United States); D. Pham, Henry M. Jackson Foundation (United States)
- 9034 1Z **Classification of essential tremors (ET) disorder and healthy controls using a masking technique** [9034-68]
R. P. Krishnamurthy, N. Sinha, International Institute of Information Technology, Bangalore (India); J. Saini, P. K. Pal, National Institute of Mental Health and Neurosciences (India)

- 9034 20 **Variability sensitivity of dynamic texture based recognition in clinical CT data** [9034-69]
R. Kwitt, Univ. of Salzburg (Austria); S. Razzaque, InnerOptic Technology, Inc. (United States); J. Lowell, Washington Univ. School of Medicine in St. Louis (United States); S. Aylward, Kitware, Inc. (United States)
- 9034 21 **Multi-view learning based robust collimation detection in digital radiographs** [9034-70]
H. Mao, Siemens Medical Solutions USA, Inc. (United States) and Rochester Institute of Technology (United States); Z. Peng, Siemens Medical Solutions USA, Inc. (United States); F. Dennerlein, Siemens AG (Germany); Y. Shinagawa, Y. Zhan, X. S. Zhou, Siemens Medical Solutions USA, Inc. (United States)
- 9034 22 **Adaptive temporal smoothing of sinogram data using Karhunen-Loeve (KL) transform for myocardial blood flow estimation from dose-reduced dynamic CT** [9034-71]
D. Modgil, The Univ. of Chicago (United States); A. M. Alessio, M. D. Bindschadler, The Univ. of Washington (United States); P. J. La Rivière, The Univ. of Chicago (United States)
- 9034 23 **Implementation of compressive sensing for preclinical cine-MRI** [9034-72]
E. Tan, Princeton Univ. (United States); M. Yang, L. Ma, Univ. of Missouri-Columbia (United States) and Harry S. Truman Veteran Hospital (United States); Y. R. Zheng, Missouri Univ. of Science and Technology (United States)
- 9034 24 **Analytic heuristics for a fast DSC-MRI** [9034-73]
M. Virgulin, M. Castellaro, F. Marcuzzi, E. Grisan, Univ. degli Studi di Padova (Italy)
- 9034 25 **Resolving complex fibre architecture by means of sparse spherical deconvolution in the presence of isotropic diffusion** [9034-74]
Q. Zhou, O. Michailovich, Univ. of Waterloo (Canada); Y. Rath, Harvard Medical School (United States)
- 9034 26 **Adaptive multi-scale total variation minimization filter for low dose CT imaging** [9034-75]
A. Zamyatin, Toshiba Medical Research Institute USA (United States); G. Katsevich, Princeton Univ. (United States); R. Krylov, Univ. of Central Florida (United States); B. Shi, Ohio Univ. (United States); Z. Yang, Toshiba Medical Research Institute USA (United States)
- 9034 27 **Semi-supervised clustering for parcellating brain regions based on resting state fMRI data** [9034-76]
H. Cheng, Y. Fan, Institute of Automation (China)
- 9034 28 **Sparse and shrunken estimates of MRI networks in the brain and their influence on network properties** [9034-77]
R. Romero-Garcia, Univ. Pablo de Olavide (Spain); L. H. Clemmensen, Technical Univ. of Denmark (Denmark)
- 9034 29 **Frequency-selective quantification of skin perfusion behavior during allergic testing using photoplethysmography imaging** [9034-78]
N. Blanik, RWTH Aachen Univ. (Germany); C. Blazek, Kantonsspital Aarau AG (Switzerland); C. Pereira, V. Blazek, S. Leonhardt, RWTH Aachen Univ. (Germany)

Part Two

- 9034 2A **Characterizing human retinotopic mapping with conformal geometry: a preliminary study** [9034-79]
D. Ta, J. Shi, Arizona State Univ. (United States); B. Barton, A. Brewer, Univ. of California, Irvine (United States); Z.-L. Lu, The Ohio State Univ. (United States); Y. Wang, Arizona State Univ. (United States)
- 9034 2B **Fusion of digital breast tomosynthesis images via wavelet synthesis for improved lesion conspicuity** [9034-80]
H. Hariharan, V. Pomponiu, Univ. of Pittsburgh (United States); B. Zheng, The Univ. of Oklahoma (United States); B. Whiting, D. Gur, Univ. of Pittsburgh (United States)
- 9034 2D **Smoothing fields of weighted collections with applications to diffusion MRI processing** [9034-82]
G. A. Sigurdsson, J. L. Prince, Johns Hopkins Univ. (United States)
- 9034 2F **Non-local total variation method for despeckling of ultrasound images** [9034-85]
J. Feng, M. Ding, X. Zhang, Huazhong Univ. of Science and Technology (China)
- 9034 2G **Stent enhancement using a locally adaptive unsharp masking filter in digital x-ray fluoroscopy** [9034-86]
Y. Jiang, E. Ekanayake, Univ. of Central Oklahoma (United States)
- 9034 2H **A local technique for contrast preserving medical image enhancement** [9034-87]
S. R. Pant, D. Ghimire, K. Park, J. Lee, Chonbuk National Univ. (Korea, Republic of)
- 9034 2I **Robust isotropic super-resolution by maximizing a Laplace posterior for MRI volumes** [9034-88]
X.-H. Han, Y. Iwamoto, Ritsumeikan Univ. (Japan); A. Shiino, Shiga Univ. of Medical Science (Japan); Y.-W. Chen, Ritsumeikan Univ. (Japan)
- 9034 2J **New multiscale speckle suppression and edge enhancement with nonlinear diffusion and homomorphic filtering for medical ultrasound imaging** [9034-89]
J. Kang, Y. Yoo, Sogang Univ. (Korea, Republic of)
- 9034 2L **Evaluating the predictive power of multivariate tensor-based morphometry in Alzheimer's disease progression via convex fused sparse group Lasso** [9034-91]
S. Tsao, Univ. of Washington (United States); N. Gajawelli, Children's Hospital Los Angeles (United States); J. Zhou, J. Shi, J. Ye, Y. Wang, Arizona State Univ. (United States); N. Lepore, Children's Hospital Los Angeles (United States)
- 9034 2M **Recognizing patterns of visual field loss using unsupervised machine learning** [9034-92]
S. Yousefi, M. H. Goldbaum, L. M. Zangwill, F. A. Medeiros, C. Bowd, Univ. of California, San Diego (United States)
- 9034 2N **False positive reduction of microcalcification cluster detection in digital breast tomosynthesis** [9034-93]
N. Xu, GE Global Research (United States) and Univ. of Illinois at Urbana-Champaign (United States); S. Yi, P. Mendonca, T. Tian, GE Global Research (United States); R. Samala, H.-P. Chan, Univ. of Michigan (United States)

- 9034 2O **Unsupervised nonlinear dimensionality reduction machine learning methods applied to multiparametric MRI in cerebral ischemia: preliminary results** [9034-94]
V. S. Parekh, Johns Hopkins Univ. School of Medicine (United States) and Johns Hopkins Univ. (United States); J. R. Jacobs, M. A. Jacobs, Johns Hopkins Univ. School of Medicine (United States)
- 9034 2P **On study design in neuroimaging heritability analyses** [9034-96]
M. E. Koran, B. Li, Vanderbilt Univ. (United States); N. Jahanshad, Univ. of California, Los Angeles (United States); T. A. Thornton-Wells, Vanderbilt Univ. (United States); D. C. Glahn, Yale Univ. (United States); P. M. Thompson, Univ. of California, Los Angeles (United States); J. Blangero, Texas Biomedical Research Institute (United States); T. E. Nichols, The Univ. of Warwick (United Kingdom); P. Kochunov, Maryland Psychiatric Research Ctr. (United States); B. A. Landman, Vanderbilt Univ. (United States)
- 9034 2Q **Determination of the intervertebral disc space from CT images of the lumbar spine** [9034-98]
R. Korez, Univ. of Ljubljana (Slovenia); D. Štern, Graz Univ. of Technology (Austria); B. Likar, F. Pernuš, T. Vrtovec, Univ. of Ljubljana (Slovenia)
- 9034 2R **Blood flow quantification using 1D CFD parameter identification** [9034-99]
R. Brosig, Technical Univ. of Munich (Germany); M. Kowarschik, Siemens AG (Germany); P. Maday, A. Katouzian, S. Demirci, N. Navab, Technical Univ. of Munich (Germany)
- 9034 2S **Arterial tree tracking from anatomical landmarks in magnetic resonance angiography scans** [9034-100]
A. O'Neil, E. Beveridge, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom); G. Houston, L. McCormick, Univ. of Dundee (United Kingdom); I. Poole, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom)
- 9034 2T **Automated volumetric breast density derived by shape and appearance modeling** [9034-101]
S. Malkov, K. Kerlikowske, J. Shepherd, Univ. of California, San Francisco (United States)
- 9034 2U **Multiple fuzzy object modeling improves sensitivity in automatic anatomy recognition** [9034-102]
L. Rittner, Univ. Estadual de Campinas (Brazil) and Univ. of Pennsylvania (United States); J. K. Udupa, D. A. Torigian, Univ. of Pennsylvania (United States)
- 9034 2V **An artifact-robust, shape library-based algorithm for automatic segmentation of inner ear anatomy in post-cochlear-implantation CT** [9034-103]
F. A. Reda, J. H. Noble, Vanderbilt Univ. (United States); R. F. Labadie, Vanderbilt Univ. Medical Ctr. (United States); B. M. Dawant, Vanderbilt Univ. (United States)
- 9034 2W **Measurement of blood flow velocity for *in vivo* video sequences with motion estimation methods** [9034-104]
Y. Liu, E. Saber, Rochester Institute of Technology (United States) and Chester F. Carlson Ctr. for Imaging Science (United States); A. Glading, Univ. of Rochester Medical Ctr. (United States); M. Helguera, Chester F. Carlson Ctr. for Imaging Science (United States)

- 9034 2X **Interpolation of longitudinal shape and image data via optimal mass transport** [9034-105]
Y. Gao, The Univ. of Alabama at Birmingham (United States); L.-J. Zhu, Stony Brook Univ. (United States); S. Bouix, Harvard Medical School (United States); A. Tannenbaum, Stony Brook Univ. (United States)
- 9034 2Y **Respiratory motion variations from skin surface on lung cancer patients from 4D CT data** [9034-106]
N. Gallego-Ortiz, J. Orban de Xivry, A. Descampe, S. Goossens, X. Geets, Univ. Catholique de Louvain (Belgium); G. Janssens, Ion Beam Applications (Belgium); B. Macq, Univ. Catholique de Louvain (Belgium)
- 9034 2Z **Motion estimation for nuclear medicine: a probabilistic approach** [9034-107]
R. Smith, Univ. of Surrey (United Kingdom); A. A. Abd. Rahni, Univ. Kebangsaan Malaysia (Malaysia) and Univ. of Surrey (United Kingdom); J. Jones, F. Tahavori, K. Wells, Univ. of Surrey (United Kingdom)
- 9034 30 **Automatic lobar segmentation for diseased lungs using an anatomy-based priority knowledge in low-dose CT images** [9034-108]
S. J. Park, J. I. Kim, J. M. Goo, D. Lee, Seoul National Univ. Hospital (Korea, Republic of)
- 9034 31 **Splitting of overlapping nuclei guided by robust combinations of concavity points** [9034-109]
M. E. Plissiti, E. Louka, C. Nikou, Univ. of Ioannina (Greece)
- 9034 32 **Brain tumor locating in 3D MR volume using symmetry** [9034-110]
P. Dvorak, Institute of Scientific Instruments of the ASCR, v.v.i. (Czech Republic) and Brno Univ. of Technology (Czech Republic); K. Bartusek, Brno Univ. of Technology (Czech Republic)
- 9034 33 **CT image noise reduction using rotational-invariant feature in Stockwell transform** [9034-111]
J. Su, Z. Li, L. Yu, J. Warner, D. Blezek, B. Erickson, Mayo Clinic (United States)
- 9034 35 **Robust vessel detection and segmentation in ultrasound images by a data-driven approach** [9034-113]
P. Guo, Q. Wang, X. Wang, Z. Hao, K. Xu, H. Ren, Samsung Advanced Institute of Technology (China); J. B. Kim, Y. Hwang, Samsung Advanced Institute of Technology (Korea, Republic of)
- 9034 36 **Enhancement of 3D modeling and classification of microcalcifications in breast computed tomography (BCT)** [9034-114]
H. Alquran, Univ. of Massachusetts Lowell (United States); E. Shaheen, Univ. Hospitals Leuven (Belgium); J. M. O'Connor, Univ. of Massachusetts Medical School (United States); M. Mahd, Univ. of Massachusetts Lowell (United States)
- 9034 37 **Quantitative analysis of rib movement based on dynamic chest bone images: preliminary results** [9034-115]
R. Tanaka, S. Sanada, Kanazawa Univ. (Japan); M. Oda, M. Mitsutaka, Kanazawa Univ. Hospital (Japan); K. Suzuki, The Univ. of Chicago (United States); K. Sakuta, H. Kawashima, Kanazawa Univ. Hospital (Japan)

- 9034 38 **Quantifying and visualizing variations in sets of images using continuous linear optimal transport** [9034-116]
S. Kolouri, G. K. Rohde, Carnegie Mellon Univ. (United States)
- 9034 39 **Context based algorithmic framework for identifying and classifying embedded images of follicle units** [9034-117]
Md. M. Rahman, S. S. Iyengar, W. Zeng, F. Hernandez, Florida International Univ. (United States); B. P. Nusbaum, P. Rose, Hair Transplant Institute of Miami (United States)
- 9034 3A **A framework for retinal layer intensity analysis for retinal artery occlusion patient based on 3D OCT** [9034-118]
J. Liao, Nanning Univ. (China); H. Chen, Soochow Univ. (China); C. Zhou, X. Chen, Joint Shantou International Eye Ctr. (China)
- 9034 3B **Single 3D cell segmentation from optical CT microscope images** [9034-119]
Y. Xie, A. P. Reeves, Cornell Univ. (United States)
- 9034 3C **Traversing and labeling interconnected vascular tree structures from 3D medical images** [9034-120]
W. G. O'Dell, Univ. of Florida (United States); S. T. Govindarajan, Massachusetts General Hospital (United States); A. Salgia, Johnson & Johnson Ltd. (India); S. Hegde, S. Prabhakaran, Univ. of Florida (United States); E. A. Finol, The Univ. of Texas at San Antonio (United States); R. J. White, Univ. of Rochester Medical Ctr. (United States)
- 9034 3D **Standardized anatomic space for abdominal fat quantification** [9034-121]
Y. Tong, J. K. Udupa, D. A. Torigian, Univ. of Pennsylvania (United States)
- 9034 3E **Registration of segmented histological images using thin plate splines and belief propagation** [9034-122]
J. Kybic, Czech Technical Univ. in Prague (Czech Republic)
- 9034 3F **Accurate fully-automated registration of coronary arteries for volumetric CT digital subtraction angiography** [9034-123]
M. Razeto, B. Mohr, Toshiba Medical Visualization Systems (United Kingdom); K. Arakita, Toshiba Medical Systems Corp. (Japan); J. D. Schuijf, Toshiba Medical Systems Europe (Netherlands); A. Fuchs, J. T. Kühl, Rigshospitalet (Denmark); M. Y. Chen, National Institutes of Health (United States); K. F. Kofoed, Rigshospitalet (Denmark)
- 9034 3G **A multi-resolution strategy for a multi-objective deformable image registration framework that accommodates large anatomical differences** [9034-124]
T. Alderliesten, Academisch Medisch Ctr. (Netherlands); P. A. N. Bosman, Ctr. voor Wiskunde en Informatica (Netherlands); J.-J. Sonke, The Netherlands Cancer Institute (Netherlands); A. Bel, Academisch Medisch Ctr. (Netherlands)
- 9034 3H **An adaptive patient specific deformable registration for breast images of positron emission tomography and magnetic resonance imaging using finite element approach** [9034-125]
C. Xue, F.-H. Tang, The Hong Kong Polytechnic Univ. (Hong Kong, China)

- 9034 3I **Computed tomography lung iodine contrast mapping by image registration and subtraction** [9034-126]
K. Goatman, C. Plakas, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom); J. Schuijf, Toshiba Medical Systems Europe (Netherlands); E. Beveridge, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom); M. Prokop, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
- 9034 3J **A hybrid biomechanical intensity based deformable image registration of lung 4DCT** [9034-127]
N. Samavati, M. Velec, Univ. of Toronto (Canada); K. Brock, Univ. of Michigan (United States)
- 9034 3K **Two-step FEM-based Liver-CT registration: improving internal and external accuracy** [9034-128]
C. Oyarzun Laura, K. Drechsler, S. Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany)
- 9034 3L **Normal distributions transform in multi-modal image registration of optical coherence tomography and computed tomography datasets** [9034-129]
J. Díaz Díaz, M. H. Riva, Leibniz Univ. Hannover (Germany); O. Majdani, Hannover Medical School (Germany); T. Ortmaier, Leibniz Univ. Hannover (Germany)
- 9034 3M **Automatic registration of imaging mass spectrometry data to the Allen Brain Atlas transcriptome** [9034-130]
W. M. Abdelmoula, R. J. Carreira, R. Shyti, B. Balluff, E. Tolner, A. M. J. M. van den Maagdenberg, Leiden Univ. Medical Ctr. (Netherlands); B. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands) and Delft Univ. of Technology (Netherlands); L. McDonnell, J. Dijkstra, Leiden Univ. Medical Ctr. (Netherlands)
- 9034 3N **Wavelet based free-form deformations for nonrigid registration** [9034-131]
W. Sun, Erasmus MC (Netherlands); W. J. Niessen, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands); S. Klein, Erasmus MC (Netherlands)
- 9034 3O **Non-rigid target tracking in 2D ultrasound images using hierarchical grid interpolation** [9034-132]
L. Royer, M. Babel, A. Krupa, INRIA Rennes (France)
- 9034 3P **Spectral embedding-based registration (SERg) for multimodal fusion of prostate histology and MRI (Cum Laude Poster Award)** [9034-133]
E. Hwuang, Rutgers, The State Univ. of New Jersey (United States); M. Rusu, Case Western Reserve Univ. (United States); S. Karthigeyan, Duke Univ. (United States); S. C. Agner, Washington Univ. School of Medicine in St. Louis (United States); R. Sparks, Univ. College London (United Kingdom); N. Shih, Univ. of Pennsylvania (United States); J. E. Tomaszewski, Univ. at Buffalo (United States); M. Rosen, M. Feldman, Univ. of Pennsylvania (United States); A. Madabhushi, Case Western Reserve Univ. (United States)
- 9034 3Q **A constrained registration problem based on Ciarlet-Geymonat stored energy** [9034-134]
R. Derfoul, MODAL'X, Univ. Paris Ouest-Nanterre (France); C. Le Guyader, Institut National des Sciences Appliquées de Rouen (France)

- 9034 3R **Automatic 3D segmentation of spinal cord MRI using propagated deformable models** [9034-135]
B. De Leener, École Polytechnique de Montréal (Canada); J. Cohen-Adad, École Polytechnique de Montréal (Canada) and Univ. de Montréal (Canada); S. Kadoury, École Polytechnique de Montréal (Canada)
- 9034 3S **Interactive approach to segment organs at risk in radiotherapy treatment planning** [9034-136]
J. Dolz, H. A. Kirsli, R. Viard, L. Massoptier, AQUILAB (France)
- 9034 3T **Auxiliary anatomical labels for joint segmentation and atlas registration** [9034-137]
T. Gass, G. Szekely, O. Goksel, ETH Zurich (Switzerland)
- 9034 3U **Improving accuracy in coronary lumen segmentation via explicit calcium exclusion, learning-based ray detection and surface optimization** [9034-138]
F. Lugauer, Siemens AG (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); J. Zhang, Y. Zheng, Siemens Corp. (United States); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); B. M. Kelm, Siemens AG (Germany)
- 9034 3V **Surface-based reconstruction and diffusion MRI in the assessment of gray and white matter damage in multiple sclerosis** [9034-139]
M. Caffini, Politecnico di Milano (Italy); N. Bergsland, Politecnico di Milano (Italy) and Fondazione Don Carlo Gnocchi (Italy); M. Laganà, E. Tavazzi, P. Tortorella, M. Rovaris, Fondazione Don Carlo Gnocchi (Italy); G. Baselli, Politecnico di Milano (Italy)
- 9034 3W **Uterus segmentation in dynamic MRI using LBP texture descriptors** [9034-140]
R. Namias, CIFASIS (Argentina); M.-E. Bellemare, M. Rahim, Lab. des Sciences de l'Information et des Systèmes, CNRS, Aix-Marseille Univ. (France); N. Pirró, Hôpital de la Timone (France)
- 9034 3X **Robust automated lymph node segmentation with random forests** [9034-142]
D. Allen, L. Lu, J. Yao, J. Liu, E. Turkbey, R. M. Summers, National Institutes of Health (United States)
- 9034 3Y **Spatially aware expectation maximization (SpAEM): application to prostate TRUS segmentation** [9034-143]
M. Orooji, Case Western Reserve Univ. (United States); R. Sparks, Univ. College London (United Kingdom); B. N. Bloch, Boston Medical Ctr. and Boston Univ. (United States); E. Feleppa, Lizzi Ctr. for Biomedical Engineering, Riverside Research Institute (United States); D. Barratt, Univ. College London (United Kingdom); A. Madabhushi, Case Western Reserve Univ. (United States)
- 9034 3Z **Combining watershed and graph cuts methods to segment organs at risk in radiotherapy** [9034-144]
J. Dolz, H. A. Kirsli, R. Viard, L. Massoptier, AQUILAB (France)
- 9034 40 **Interactive segmentation of tongue contours in ultrasound video sequences using quality maps** [9034-145]
S. Ghrenassia, Ecole de Technologie Supérieure (Canada); L. Ménard, Univ. du Québec à Montréal (Canada); C. Laporte, Ecole de Technologie Supérieure (Canada)

- 9034 41 **Automatic FDG-PET-based tumor and metastatic lymph node segmentation in cervical cancer** [9034-146]
D. R. Arbonès, H. G. Jensen, Univ. of Copenhagen (Denmark); A. Loft, P. Munck af Rosenschöld, Rigshospitalet (Denmark); A. E. Hansen, C. Igel, S. Darkner, Univ. of Copenhagen (Denmark)
- 9034 42 **MRI brain tumor segmentation and necrosis detection using adaptive Sobolev snakes** [9034-147]
A. Nakhmani, The Univ. of Alabama at Birmingham (United States); R. Kikinis, Brigham and Women's Hospital (United States); A. Tannenbaum, Stony Brook Univ. (United States)
- 9034 43 **Real-time 3D medical structure segmentation using fast evolving active contours** [9034-148]
X. Wang, Q. Wang, Z. Hao, K. Xu, P. Guo, H. Ren, Samsung Advanced Institute of Technology (China); W. Jang, J. Kim, Samsung Advanced Institute of Technology (Korea, Republic of)
- 9034 44 **Finding seed points for organ segmentation using example annotations** [9034-149]
R. Joyseeree, Univ. of Applied Sciences Western Switzerland (Switzerland) and ETH Zurich (Switzerland); H. Müller, Univ. of Applied Sciences Western Switzerland (Switzerland) and Univ. Hospitals, Univ. of Geneva (Switzerland)
- 9034 45 **Atherosclerotic carotid lumen segmentation in combined B-mode and contrast enhanced ultrasound images** [9034-150]
Z. Akkus, D. D. B. Carvalho, S. Klein, S. C. H. van den Oord, A. F. L. Schinkel, N. de Jong, A. F. W. van der Steen, J. G. Bosch, Erasmus MC (Netherlands)
- 9034 46 **Shape-constrained multi-atlas segmentation of spleen in CT** [9034-151]
Z. Xu, B. Li, S. Panda, A. J. Asman, K. L. Merkle, P. L. Shanahan, R. G. Abramson, B. A. Landman, Vanderbilt Univ. (United States)
- 9034 47 **Multi-atlas segmentation with particle-based group-wise image registration** [9034-152]
J. Lee, I. Lyu, M. Styner, The Univ. of North Carolina at Chapel Hill (United States)
- 9034 48 **Development of automated extraction method of biliary tract from abdominal CT volumes based on local intensity structure analysis** [9034-153]
K. Koga, Y. Hayashi, T. Hirose, M. Oda, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); T. Igami, M. Nagino, K. Mori, Nagoya Univ. (Japan)
- 9034 49 **Automatic detection of mitochondria from electron microscope tomography images: a curve fitting approach** [9034-154]
S. F. Tasel, Çankaya Univ. (Turkey) and Middle East Technical Univ. (Turkey); R. Hassanpour, Çankaya Univ. (Turkey); E. U. Mumcuoglu, Middle East Technical Univ. (Turkey); G. Perkins, M. Martone, Univ. of California, San Diego (United States)
- 9034 4A **Automatic segmentation of vertebral arteries in CT angiography using combined circular and cylindrical model fitting** [9034-155]
M. J. Lee, H. Hong, Seoul Women's Univ. (Korea, Republic of); J. W. Chung, Seoul National Univ. Hospital (Korea, Republic of)

- 9034 4B **Three dimensional level set based semiautomatic segmentation of atherosclerotic carotid artery wall volume using 3D ultrasound imaging** [9034-156]
Md. M. Hossain, K. AlMuhanna, George Mason Univ. (United States); L. Zhao, Univ. of Maryland (United States); B. K. Lal, Univ. of Maryland (United States) and Veterans Affairs Maryland Health Care System (United States); S. Sikdar, George Mason Univ. (United States)
- 9034 4C **Bladder segmentation in MR images with watershed segmentation and graph cut algorithm** [9034-157]
T. Blaffert, S. Renisch, N. Schadewaldt, H. Schulz, R. Wiemker, Philips Research Labs. (Germany)
- 9034 4D **Neurosphere segmentation in brightfield images** [9034-159]
J. Cheng, W. Xiong, S. C. Chia, J. H. Lim, Institute for Infocomm Research (Singapore); S. Sankaran, S. Ahmed, Institute of Medical Biology (Singapore)
- 9034 4E **3D pre- versus post-season comparisons of surface and relative pose of the corpus callosum in contact sport athletes** [9034-160]
Y. Lao, N. Gajawelli, Children's Hospital Los Angeles (United States) and The Univ. of Southern California (United States); L. Haas, The Univ. of Southern California (United States); B. Wilkins, Children's Hospital Los Angeles (United States) and The Univ. of Southern California (United States); D. Hwang, S. Tsao, The Univ. of Southern California (United States); Y. Wang, Arizona State Univ. (United States); M. Law, The Univ. of Southern California (United States); N. Leporé, Children's Hospital Los Angeles (United States) and The Univ. of Southern California (United States)
- 9034 4F **A versatile tomographic forward- and back-projection approach on multi-GPUs** [9034-161]
A. Fehring, Technische Univ. München (Germany); T. Lasser, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); I. Zanette, P. B. Noël, F. Pfeiffer, Technische Univ. München (Germany)
- 9034 4G **Genomic connectivity networks based on the BrainSpan atlas of the developing human brain** [9034-162]
A. Mahfouz, Delft Univ. of Technology (Netherlands) and Leids Univ. Medical Ctr. (Netherlands); M. N. Ziats, National Institutes of Health (United States), Univ. of Cambridge (United Kingdom), and Baylor College of Medicine (United States); O. M. Rennert, National Institutes of Health (United States); B. P. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands) and Delft Univ. of Technology (Netherlands); M. J. T. Reinders, Delft Univ. of Technology (Netherlands)
- 9034 4H **Wavelets based algorithm for the evaluation of enhanced liver areas** [9034-163]
M. Alvarez, D. Rodrigues de Pina, G. Giacomini, F. Gomes Romeiro, Univ. Estadual Paulista (Brazil); S. Barbosa Duarte, Brazilian Ctr. of Research in Physics (Brazil); S. Yamashita, J. R. de Arruda Miranda, Univ. Estadual Paulista (Brazil)
- 9034 4I **3D segmentation of masses in DCE-MRI images using FCM and adaptive MRF** [9034-164]
C. Zhang, L. Li, Hangzhou Dianzi Univ. (China)

Author Index

Conference Committee

Symposium Chairs

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

Conference Chairs

Sebastien Ourselin, University College London (United Kingdom)
Martin A. Styner, The University of North Carolina at Chapel Hill
(United States)

Conference Program Committee

Paul Aljabar, King's College London (United Kingdom)
Mostafa Analoui, The Livingston Group, LLC (United States)
Elsa D. Angelini, Telecom ParisTech (France) and Columbia University
(United States)
Kyongtae Ty Bae, University of Pittsburgh Medical Center (United States)
Christian Barillot, IRISA / INRIA Rennes (France)
Benoit M. Dawant, Vanderbilt University (United States)
Baowei Fei, Emory University (United States)
Aaron Fenster, Robarts Research Institute (Canada)
Alejandro F. Frangi, The University of Sheffield (United Kingdom)
Mona K. Garvin, The University of Iowa (United States)
James C. Gee, University of Pennsylvania (United States)
Guido Gerig, The University of Utah (United States)
David R. Haynor, University of Washington (United States)
Tobias Heimann, Siemens AG (Germany)
Bennett A. Landman, Vanderbilt University (United States)
Tianhu Lei, University of Pittsburgh Medical Center (United States)
Boudewijn P. F. Lelieveldt, Leids Universitair Medisch Centrum
(Netherlands)
Murray H. Loew, The George Washington University (United States)
Cristian Lorenz, Philips Medizin Systeme GmbH (Germany)
Frederik Maes, Katholieke Universiteit Leuven (Belgium)
Vincent A. Magnotta, The University of Iowa Hospitals and Clinics
(United States)
Sunanda D. Mitra, Texas Tech University (United States)
Kensaku Mori, Nagoya University (Japan)
Nassir Navab, Technische Universität München (Germany)
Mads Nielsen, University of Copenhagen (Denmark)
Wiro Niessen, Erasmus MC (Netherlands) and Technische Universiteit Delft
(Netherlands)
Brian S. Nutter, Texas Tech University (United States)

Josien P. W. Pluim, Universitair Medisch Centrum Utrecht (Netherlands)
Jerry L. Prince, Johns Hopkins University (United States)
Sonia Pujol, Harvard Medical School (United States) and Brigham and Women's Hospital (United States)
Punam K. Saha, The University of Iowa (United States)
Olivier Salvado, Commonwealth Scientific and Industrial Research Organisation (Australia)
Julia A. Schnabel, University of Oxford (United Kingdom)
Philippe Thévenaz, École Polytechnique Fédérale de Lausanne (Switzerland)
Jayaram K. Udupa, The University of Pennsylvania Health System (United States)
Tomaž Vrtovec, University of Ljubljana (Slovenia)
Andreas Wahle, The University of Iowa (United States)

Session Chairs

- 1 OCT and Ultrasound
Aaron Fenster, Robarts Research Institute (Canada)
Mona K. Garvin, The University of Iowa (United States)
- 2 Segmentation
Brian S. Nutter, Texas Tech University (United States)
Elsa D. Angelini, Telecom ParisTech (France) and Columbia University (United States)
- 3 Temporal and Motion Analysis
Jerry L. Prince, Johns Hopkins University (United States)
Jayaram K. Udupa, The University of Pennsylvania Health System (United States)
- 4 Cardiac and Vascular Imaging
Boudewijn P. F. Lelieveldt, Leids Universitair Medisch Centrum (Netherlands)
Alejandro F. Frangi, The University of Sheffield (United Kingdom)
- 5 DTI
Sonia Pujol, Harvard Medical School (United States) and Brigham and Women's Hospital (United States)
James C. Gee, University of Pennsylvania (United States)
- 6 Shape
Punam K. Saha, The University of Iowa (United States)
Cristian Lorenz, Philips Medizin Systeme GmbH (Germany)
- 7 Keynote and Brain
David R. Haynor, University of Washington (United States)
Benoit M. Dawant, Vanderbilt University (United States)

- 8 Classification and Texture
Baowei Fei, Emory University (United States)
Tomaž Vrtovec, University of Ljubljana (Slovenia)
- 9 Registration
Josien P. W. Pluim, Universitair Medisch Centrum Utrecht (Netherlands)
- 10 Atlas-based Segmentation
Bennett A. Landman, Vanderbilt University (United States)
- 11 Magnetic Resonance Imaging
Sunanda D. Mitra, Texas Tech University (United States)

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.

This award is cosponsored 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)

Conference Award

2014 Recipients:

Cum Laude Poster Award: **Spectral embedding-based registration (SERg) for multimodal fusion of prostate histology and MRI** [9034-133]

E. Hwuang, Rutgers, The State Univ. of New Jersey (United States); M. Rusu, Case Western Reserve Univ. (United States); S. Karthigeyan, Duke Univ. (United States); S. C. Agner, Washington Univ. School of Medicine in St. Louis (United States); R. Sparks, Univ. College London (United Kingdom); N. Shih, Univ. of Pennsylvania (United States); J. E. Tomaszewski, Univ. at Buffalo (United States); M. Rosen, M. Feldman, Univ. of Pennsylvania (United States); A. Madabhushi, Case Western Reserve Univ. (United States)