

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING

Vol. 13, No. 30

Medical Imaging 2012

Image Processing

David R. Haynor
Sébastien Ourselin
Editors

6–9 February 2012
San Diego, California, United States

Sponsored by
SPIE

Cosponsored by
Agilent Technologies • Diamond SA (Switzerland) • DQE Instruments, Inc. (Canada)
eMagine (United States) • Isuzu Glass Company, Ltd. (Japan) • Medtronic, Inc. • Ocean Thin
Films, Inc. (United States)

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

Published by
SPIE

Part One of Two Parts
Volume 8314

Proceedings of SPIE, 1605-7422, v. 8314

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

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 2012: Image Processing*, edited by David R. Haynor, Sébastien Ourselin, Proceedings of SPIE Vol. 8314 (SPIE, Bellingham, WA, 2012) Article CID Number.

ISSN 1605-7422

ISBN 9780819489630

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 © 2012, 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 1605-7422/12/\$18.00.

Printed in the United States of America.

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

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

xxiii	Conference Committee
xxvii	Fortieth Anniversary of SPIE Medical Imaging Meeting (Overview Paper) R. M. Nishikawa, Carl J. Vyborny Translation Lab. for Breast Imaging Research, The Univ. of Chicago (United States)

Part One

SESSION 1	SEGMENTATION I
8314 02	A patient-specific segmentation framework for longitudinal MR images of traumatic brain injury [8314-01] B. Wang, M. Prastawa, The Univ. of Utah (United States); A. Irimia, M. C. Chambers, P. M. Vespa, J. D. Van Horn, Univ. of California, Los Angeles (United States); G. Gerig, The Univ. of Utah (United States)
8314 03	Comparison of threshold-based and watershed-based segmentation for the truncation compensation of PET/MR images [8314-02] T. Blaffert, S. Renisch, Philips Research Labs. (Germany); J. Tang, M. Narayanan, Z. Hu, Philips Healthcare (United States)
8314 04	Validation of model-based pelvis bone segmentation from MR images for PET/MR attenuation correction [8314-03] S. Renisch, T. Blaffert, Philips Research Labs. (Germany); J. Tang, Z. Hu, Philips Healthcare (United States)
8314 05	Automatic bone segmentation in knee MR images using a coarse-to-fine strategy [8314-04] S. H. Park, Seoul National Univ. (Korea, Republic of); S. Lee, SAMSUNG Electronics (Korea, Republic of); I. D. Yun, Hankuk Univ. of Foreign Studies (Korea, Republic of); S. U. Lee, Seoul National Univ. (Korea, Republic of)
8314 06	Fully automated prostate segmentation in 3D MR based on normalized gradient fields cross-correlation initialization and LOGISMOS refinement [8314-05] Y. Yin, S. V. Fotin, S. Periaswamy, J. Kunz, H. Haldankar, N. Muradyan, iCAD Inc. (United States); F. Cornud, Ctr. d'Imagerie Medicale Tourville (France); B. Turkbey, P. Choyke, National Cancer Institute (United States)
SESSION 2	REGISTRATION I
8314 07	Real-time 2D/3D registration for tumor motion tracking during radiotherapy [8314-06] H. Furtado, C. Gendrin, C. Bloch, J. Spoerk, S. A. Pawiro, C. Weber, M. Figl, M. Stock, D. Georg, H. Bergmann, W. Birkfellner, Medical Univ. Vienna (Austria)

- 8314 08 **Robust elastic 2D/3D geometric graph matching** [8314-07]
E. Serradell, Institut de Robòtica i Informàtica Industrial (Spain); J. Kybic, Czech Technical Univ. in Prague (Czech Republic); F. Moreno-Noguer, Institut de Robòtica i Informàtica Industrial (Spain); P. Fua, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
- 8314 09 **Non-rigid surface proximity registration of CT images considering the influence of pleural thickenings** [8314-08]
P. Faltin, RWTH Aachen (Germany); K. Chaisaowong, RWTH Aachen (Germany) and King Mongkut's Univ. of Technology North Bangkok (Thailand); T. Kraus, Univ. Hospital Aachen (Germany); T. Aach, RWTH Aachen (Germany)
- 8314 0A **Joint estimation of subject motion and tracer kinetic parameters of dynamic PET data in an EM framework** [8314-09]
J. Jiao, Univ. of Oxford (United Kingdom); C. A. Salinas, G. E. Searle, Imanova Ltd. (United Kingdom); R. N. Gunn, Univ. of Oxford (United Kingdom) and Imanova Ltd. (United States); J. A. Schnabel, Univ. of Oxford (United Kingdom)
- 8314 0B **Nonrigid registration and classification of the kidneys in 3D dynamic contrast enhanced (DCE) MR images** [8314-10]
X. Yang, P. Ghafourian, P. Sharma, K. Salman, D. Martin, Emory Univ. (United States); B. Fei, Winship Cancer Institute of Emory Univ. (United States) and Georgia Institute of Technology (United States)
- 8314 0C **Super-resolution reconstruction for tongue MR images** [8314-11]
J. Woo, Univ. of Maryland, Baltimore (United States) and The Johns Hopkins Univ. (United States); Y. Bai, HeartFlow, Inc. (United States); S. Roy, E. Z. Murano, The Johns Hopkins Univ. (United States); M. Stone, Univ. of Maryland, Baltimore (United States); J. L. Prince, The Johns Hopkins Univ. (United States)

SESSION 3 KEYNOTE AND CARDIAC APPLICATIONS

- 8314 0E **Representation of deformable motion for compression of dynamic cardiac image data** [8314-13]
A. Weinlich, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and Siemens AG (Germany); P. Amon, A. Hutter, Siemens AG (Germany); A. Kaup, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 8314 0F **Automatic detection of cardiac cycle and measurement of the mitral annulus diameter in 4D TEE images** [8314-14]
B. Graser, German Cancer Research Ctr. (Germany); M. Hien, H. Rauch, Univ. of Heidelberg (Germany); H.-P. Meinzer, T. Heimann, German Cancer Research Ctr. (Germany)
- 8314 0G **Feasibility of determining myocardial transient ischemic dilation from cardiac CT by automated stress/rest registration** [8314-15]
J. Woo, Cedars-Sinai Medical Ctr. (United States); P. J. Slomka, Cedars-Sinai Medical Ctr. (United States) and Univ. of California, Los Angeles (United States); R. Nakazato, B. K. Tamarappoo, Cedars-Sinai Medical Ctr. (United States); J. K. Min, G. Germano, D. S. Berman, D. Dey, Cedars-Sinai Medical Ctr. (United States) and Univ. of California, Los Angeles (United States)

- 8314 OH **Localised manifold learning for cardiac image analysis** [8314-16]
K. K. Bhatia, Imperial College London (United Kingdom); A. N. Price, J. V. Hajnal, MRC Clinical Sciences Ctr. (United Kingdom); D. Rueckert, Imperial College London (United Kingdom)

SESSION 4 DIFFUSION IMAGING

- 8314 OI **HARDI denoising using nonlocal means on S^2** [8314-17]
A. Kuurstra, S. Dolui, O. Michailovich, Univ. of Waterloo (Canada)
- 8314 OJ **Measures for validation of DTI tractography** [8314-18]
S. Gouttard, The Univ. of Utah (United States); C. B. Goodlett, Kitware, Inc. (United States); M. Kubicki, Harvard Medical School (United States); G. Gerig, The Univ. of Utah (United States)
- 8314 OK **Towards automatic quantitative quality control for MRI** [8314-19]
C. B. Lauzon, Vanderbilt Univ. (United States); B. C. Caffo, Johns Hopkins Medical Institute (United States); B. A. Landman, Vanderbilt Univ. (United States)
- 8314 OL **Using radial NMR profiles to characterize pore size distributions** [8314-20]
R. Deriche, INRIA Sophia Antipolis - Méditerranée (France); J. Treilhard, Queen's Univ. (Canada)
- 8314 OM **Efficient global fiber tracking on multi-dimensional diffusion direction maps** [8314-21]
J. Klein, B. Köhler, H. K. Hahn, Fraunhofer MEVIS (Germany)

SESSION 5 SHAPE: APPLICATIONS AND METHODS

- 8314 ON **Efficient searching of globally optimal and smooth multi-surfaces with shape priors** [8314-22]
L. Xu, B. Stojkovic, H. Ding, Univ. at Buffalo (United States); Q. Song, X. Wu, M. Sonka, The Univ. of Iowa (United States); J. Xu, Univ. at Buffalo (United States)
- 8314 OO **A shape prior-based MRF model for 3D masseter muscle segmentation** [8314-23]
T. Majeed, K. Fundana, M. Lüthi, Univ. of Basel (Switzerland); J. Beinemann, Univ. Hospital Basel (Switzerland); P. Cattin, Univ. of Basel (Switzerland)
- 8314 OP **Segmentation of parotid glands in head and neck CT images using a constrained active shape model with landmark uncertainty** [8314-24]
A. Chen, J. H. Noble, Vanderbilt Univ. (United States); K. J. Niemann, Vanderbilt-Ingram Cancer Ctr. (United States); M. A. Deeley, Univ. of Vermont (United States); B. M. Dawant, Vanderbilt Univ. (United States)
- 8314 OQ **Classification of Alzheimer's disease patients with hippocampal shape wrapper-based feature selection and support vector machine** [8314-25]
J. Young, G. Ridgway, K. Leung, S. Ourselin, Univ. College London (United Kingdom)

- 8314 OR **Consistent estimation of shape parameters in statistical shape model by symmetric EM algorithm** [8314-26]
K. Shen, Australian e-Health Research Ctr. (Australia) and Lab. Electronique, Informatique et Image, CNRS, Univ. de Bourgogne (France); P. Bourgeat, J. Fripp, Australian e-Health Research Ctr. (Australia); F. Meriaudeau, Lab. Electronique, Informatique et Image, CNRS, Univ. de Bourgogne (France); O. Salvado, Australian e-Health Research Ctr. (Australia)
- 8314 OS **A hybrid framework of multiple active appearance models and global registration for 3D prostate segmentation in MRI** [8314-27]
S. Ghose, Univ. de Girona (Spain) and Lab. Electronique, Informatique et Image, CNRS, Univ. de Bourgogne (France); A. Oliver, R. Martí, X. Lladó, J. Freixenet, Univ. de Girona (Spain); J. Mitra, Univ. de Girona (Spain) and Lab. Electronique, Informatique et Image, CNRS, Univ. de Bourgogne (France); J. C. Vilanova, Clinica Girona (Spain); F. Meriaudeau, Lab. Electronique, Informatique et Image, CNRS, Univ. de Bourgogne (France)

SESSION 6 SEGMENTATION II

- 8314 OT **Robust estimation of mammographic breast density: a patient-based approach** [8314-28]
H. S. Heese, K. Erhard, A. Gooßen, T. Bulow, Philips Technologie GmbH Innovative Technologies (Germany)
- 8314 OU **Image segmentation using random-walks on the histogram** [8314-29]
J.-P. Morin, C. Desrosiers, L. Duong, Ecole de Technologie Supérieure (Canada)
- 8314 OV **Normalized gradient fields cross-correlation for automated detection of prostate in magnetic resonance images** [8314-30]
S. V. Fotin, Y. Yin, S. Periaswamy, J. Kunz, H. Haldankar, N. Muradyan, iCAD, Inc. (United States); F. Cornud, Ctr. d'Imagerie Medicale Tourville (France); B. Turkbey, P. L. Choyke, National Cancer Institute (United States)
- 8314 OW **Automatic lung lobe segmentation of COPD patients using iterative B-spline fitting** [8314-31]
D. P. Shamonin, M. Staring, M. E. Bakker, Leids Univ. Medisch Ctr. (Netherlands); C. Xiao, Hunan Univ. (China); J. Stolk, J. H. C. Reiber, B. C. Stoel, Leids Univ. Medisch Ctr. (Netherlands)
- 8314 OX **Iterative approach to joint segmentation of cellular structures** [8314-32]
P. Ajemba, R. Scott, J. Ramachandran, Q. Liu, F. Khan, J. Zeineh, M. Donovan, G. Fernandez, Aureon Biosciences, Inc. (United States)

SESSION 7 LABEL FUSION

- 8314 OY **Simultaneous segmentation and statistical label fusion** [8314-33]
A. J. Asman, Vanderbilt Univ. (United States); B. A. Landman, Vanderbilt Univ. (United States) and The John Hopkins Univ. (United States)
- 8314 OZ **Manifold learning for atlas selection in multi-atlas-based segmentation of hippocampus** [8314-34]
A. K. Hoang Duc, M. Modat, K. K. Leung, Univ. College London (United Kingdom); T. Kadir, Mirada Medical (United Kingdom); S. Ourselin, Univ. College London (United Kingdom)

- 8314 10 **Local SIMPLE multi-atlas-based segmentation applied to lung lobe detection on chest CT** [8314-35]
M. Agarwal, Leiden Univ. Medical Ctr. (Netherlands) and Delft Univ. of Technology (Netherlands); E. A. Hendriks, Delft Univ. of Technology (Netherlands); B. C. Stoel, M. E. Bakker, J. H. C. Reiber, M. Staring, Leiden Univ. Medical Ctr. (Netherlands)
- 8314 11 **Generalized statistical label fusion using multiple consensus levels** [8314-36]
Z. Xu, A. J. Asman, Vanderbilt Univ. (United States); B. A. Landman, Vanderbilt Univ. (United States) and The Johns Hopkins Univ. (United States)

SESSION 8 BRAIN APPLICATIONS

- 8314 12 **Sparse regression analysis of task-relevant information distribution in the brain** [8314-37]
I. Rish, G. A. Cecchi, IBM Thomas J. Watson Research Ctr. (United States); K. Heuton, Univ. of Minnesota, Twin Cities (United States); M. N. Baliki, A. V. Apkarian, Northwestern Univ. (United States)
- 8314 13 **A surface based approach for cortical thickness comparison between PiB+ and PiB- healthy control subjects** [8314-38]
V. Doré, P. Bourgeat, J. Fripp, Australian e-Health Research Ctr. (Australia); O. Acosta, INSERM, Univ. de Rennes (France); G. Chetelat, Univ. de Caen Basse-Normandie (France); C. Szoëke, Commonwealth Scientific and Industrial Research Organisation (Australia); K. A. Ellis, The Univ. of Melbourne (Australia) and National Ageing Research Institute (Australia); R. N. Martins, Edith Cowan Univ. (Australia) and Hollywood Private Hospital (Australia); V. Villemagne, C. L. Masters, The Univ. of Melbourne (Australia); D. Ames, The Univ. of Melbourne (Australia) and National Ageing Research Institute (Australia); C. C. Rowe, The Univ. of Melbourne (Australia); O. Salvado, Australian e-Health Research Ctr. (Australia)
- 8314 14 **Simultaneous cortical surface labeling and sulcal curve extraction** [8314-39]
Z. Yang, A. Carass, C. Chen, J. L. Prince, The Johns Hopkins Univ. (United States)
- 8314 15 **fMRI alignment based on local functional connectivity patterns** [8314-40]
D. Jiang, Zhejiang Univ. (China) and Institute of Automation (China); Y. Du, Institute of Automation (China) and North Univ. of China (China); H. Cheng, T. Jiang, Y. Fan, Institute of Automation (China)
- 8314 16 **A comparison of distributional considerations with statistical analysis of resting state fMRI at 3T and 7T** [8314-41]
X. Yang, M. J. Holmes, A. T. Newton, V. L. Morgan, Vanderbilt Univ. (United States); B. A. Landman, Vanderbilt Univ. (United States) and The John Hopkins Univ. (United States)

SESSION 9 REGISTRATION II

- 8314 17 **Nearly rigid descriptor-based matching for volume reconstruction from histological sections** [8314-42]
S. Sun, N. De Magalhães, N. D. Cahill, Rochester Institute of Technology (United States)

- 8314 18 **Nonrigid free-form registration using landmark-based statistical deformation models** [8314-43]
S. Psczolkowski, L. Pizarro, R. Guerrero, D. Rueckert, Imperial College London (United Kingdom)
- 8314 19 **Estimation of rigid-body registration quality using registration networks (Best Student Paper Award)** [8314-44]
R. Datteri, B. M. Dawant, Vanderbilt Univ. (United States)
- 8314 1A **Registration of 3D spectral OCT volumes combining ICP with a graph-based approach** [8314-45]
M. Niemeijer, K. Lee, The Univ. of Iowa (United States); M. K. Garvin, M. D. Abràmoff, The Univ. of Iowa (United States) and Veterans Affairs Medical Ctr. (United States); M. Sonka, The Univ. of Iowa (United States)
- 8314 1B **Elastic registration based on matrix-valued spline functions and direct integration of landmarks and intensities** [8314-46]
S. Wörz, A. Biesdorf, K. Rohr, Univ. of Heidelberg (Germany)
- 8314 1C **Minimally deformed correspondences between surfaces for intra-operative registration** [8314-47]
T. R. dos Santos, C. J. Goch, A. M. Franz, H.-P. Meinzer, T. Heimann, L. Maier-Hein, German Cancer Resarch Ctr. (Germany)

SESSION 10 OCT AND ULTRASOUND

- 8314 1D **Automatic detection and segmentation of renal lesions in 3D contrast-enhanced ultrasound images** [8314-48]
R. Prevost, Philips Healthcare (France) and CEREMADE, CNRS, Univ. Paris Dauphine (France); L. D. Cohen, CEREMADE, CNRS, Univ. Paris Dauphine (France); J.-M. Correas, Hospital Necker (France); R. Ardon, Philips Healthcare (France)
- 8314 1E **Lesion segmentation and bias correction in breast ultrasound B-mode images including elastography information** [8314-49]
G. Pons, J. Martí, R. Martí, M. Cabezas, Univ. of Girona (Spain); A. di Battista, J. A. Noble, Univ. of Oxford (United Kingdom)
- 8314 1F **Real-time segmentation in 4D ultrasound with continuous max-flow** [8314-50]
M. Rajchl, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); J. Yuan, The Univ. of Western Ontario (Canada); T. M. Peters, Robarts Research Institute (Canada) and Univ. of Western Ontario (Canada)
- 8314 1G **Incorporation of texture-based features in optimal graph-theoretic approach with application to the 3D segmentation of intraretinal surfaces in SD-OCT volumes** [8314-51]
B. J. Antony, The Univ. of Iowa (United States); M. D. Abràmoff, The Univ. of Iowa (United States) and Veterans Affairs Medical Ctr. (United States); M. Sonka, Y. H. Kwon, The Univ. of Iowa (United States); M. K. Garvin, Veterans Affairs Medical Ctr. (United States) and The Univ. of Iowa (United States)

- 8314 1H **Parallel graph search: application to intraretinal layer segmentation of 3D macular OCT scans** [8314-52]
K. Lee, The Univ. of Iowa (United States); M. D. Abràmoff, The Univ. of Iowa (United States) and Veterans Affairs Medical Ctr. (United States); M. K. Garvin, Veterans Affairs Medical Ctr. (United States) and The Univ. of Iowa (United States); M. Sonka, The Univ. of Iowa (United States)

SESSION 11 SEGMENTATION OF VESSELS AND TUBULAR STRUCTURES

- 8314 1I **Automated reconstruction of neural trees using front re-initialization** [8314-53]
A. Mukherjee, A. Stepanyants, Northeastern Univ. (United States)
- 8314 1J **Segmentation of anatomical branching structures based on texture features and conditional random field** [8314-54]
T. Nuzhnaya, Temple Univ. (United States); P. Bakic, D. Kontos, The Univ. of Pennsylvania Health System (United States); V. Megalooikonomou, H. Ling, Temple Univ. (United States)
- 8314 1K **Liver vessel tree segmentation based on a hybrid graph cut / fuzzy connectedness method** [8314-55]
X. Chen, The Univ. of Iowa (United States)
- 8314 1L **Contrast independent detection of branching points in network-like structures** [8314-56]
B. Obara, M. Fricker, V. Grau, Univ. of Oxford (United Kingdom)
- 8314 1M **Robust RANSAC-based blood vessel segmentation** [8314-57]
A. Yureidini, Inria Nancy Grand-Est (France) and Inria Lille - Nord Europe (France); E. Kerrien, Inria Nancy Grand-Est (France); S. Cotin, Inria Lille - Nord Europe (France)

SESSION 12 DIGITAL PATHOLOGY I

- 8314 1N **Robust alignment of prostate histology slices with quantified accuracy** [8314-58]
C. Hughes, Ctr. Competence International Tele Image (CCITI) (France) and INSERM (France) and CREATIS, CNRS, Univ. Lyon 1 (France); O. Rouvière, INSERM (France) and Hospices Civils de Lyon (France); F. Mege Lechevallier, Hospices Civils de Lyon (France); R. Souchon, INSERM (France); R. Prost, CREATIS, CNRS, Univ. Lyon 1 (France)

SESSION 13 DIGITAL PATHOLOGY II

- 8314 1O **Reconstruction of incomplete cell paths through a 3D-2D level set segmentation** [8314-59]
M. Hariri, J. W. L. Wan, Univ. of Waterloo (Canada)

POSTER SESSION: REGISTRATION

- 8314 1Q **On the construction of topology-preserving deformations** [8314-61]
D. Apprato, Univ. de Pau et des Pays de l'Adour (France); C. Gout, C. Le Guyader, Institut National des Sciences Appliquées de Rouen (France)

- 8314 1R **Motion coherent image registration and demons: practical handling of deformation boundaries** [8314-62]
N. D. Cahill, Rochester Institute of Technology (United States)
- 8314 1S **Image registration method based on multiresolution for dual-energy subtraction radiography** [8314-63]
T. Kawamura, N. Omae, M. Yamada, W. Ito, FUJIFILM Corp. (Japan); K. Kawamoto, T. Doi, Osaka Univ. Graduate School of Medicine (Japan)
- 8314 1T **3D-2D registration of cerebral angiograms based on vessel directions and intensity gradients** [8314-64]
U. Mitrović, Ž. Špiclin, D. Štern, Univ. of Ljubljana (Slovenia); P. Markelj, B. Likar, Univ. of Ljubljana (Slovenia) and Sensum Computer Vision Systems (Slovenia); Z. Milošević, Univ. of Ljubljana (Slovenia); F. Pernuš, Univ. of Ljubljana (Slovenia) and Sensum Computer Vision Systems (Slovenia)
- 8314 1U **Improving point registration in dental cephalograms by two-stage rectified point translation transform** [8314-65]
W. K. Tam, H. J. Lee, Tzu Chi Univ. (Taiwan)
- 8314 1V **Robust registration of sparsely sectioned histology to ex-vivo MRI of temporal lobe resections** [8314-66]
M. Goubran, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); A. R. Khan, C. Crukley, S. Buchanan, B. Santyr, Robarts Research Institute (Canada); S. deRibaupierre, The Univ. of Western Ontario (Canada); T. M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada)
- 8314 1W **Regularity-guaranteed transformation estimation in medical image registration** [8314-67]
B. Shi, J. Liu, Ohio Univ. (United States)
- 8314 1Y **Quantitative assessment of mis-registration issues of diffusion tensor imaging (DTI)** [8314-69]
Y. Li, H. Jiang, S. Mori, The Johns Hopkins Univ. School of Medicine (United States)
- 8314 1Z **Using fractional gradient information in non-rigid image registration: application to breast MRI** [8314-70]
A. Melbourne, Univ. College London (United Kingdom); N. Cahill, Rochester Institute of Technology (United States); C. Tanner, M. Modat, D. J. Hawkes, S. Ourselin, Univ. College London (United Kingdom)
- 8314 20 **Multi-objective optimization for deformable image registration: proof of concept** [8314-71]
T. Alderliesten, J.-J. Sonke, The Netherlands Cancer Institute (Netherlands); P. A. N. Bosman, Ctr. Wiskunde & Informatica (Netherlands)
- 8314 21 **Automatic correspondence detection in mammogram and breast tomosynthesis images** [8314-72]
J. Ehrhardt, J. Krüger, Univ. of Lübeck (Germany); A. Bischof, J. Barkhausen, Univ. Medical Ctr. Schleswig-Holstein (Germany); H. Handels, Univ. of Lübeck (Germany)
- 8314 23 **An image registration based ultrasound probe calibration** [8314-74]
X. Li, D. Kumar, S. Sarkar, R. Narayanan, Eigen Inc. (United States)

- 8314 24 **Medical image registration using machine learning-based interest point detector** [8314-75]
S. Sergeev, Y. Zhao, San Francisco State Univ. (United States); M. G. Linguraru, Children's National Medical Ctr. (United States); K. Okada, San Francisco State Univ. (United States)
- 8314 25 **Automatic control-point selection for image registration using disparity fitting** [8314-76]
D. M. Conover, The George Washington Univ. (United States); J. K. Delaney, National Gallery of Art (United States); P. Ricciardi, The Fitzwilliam Museum (United States); M. H. Loew, The George Washington Univ. (United States)

POSTER SESSION: SEGMENTATION

- 8314 26 **Vessel segmentation using an iterative fast marching approach with directional prior** [8314-77]
W. Liao, S. Wörz, K. Rohr, Ruprecht-Karls-Univ. Heidelberg (Germany) and German Cancer Research Ctr. Heidelberg (Germany)
- 8314 27 **Adaptive epithelial cytoplasm segmentation and epithelial unit separation in immunofluorescent images** [8314-78]
J. Ramachandran, R. Scott, P. Ajemba, H. Karvir, F. Khan, J. Zeineh, M. Donovan, G. Fernandez, Aureon Biosciences, Inc. (United States)
- 8314 28 **Nuclei extraction from histopathological images using a marked point process approach** [8314-79]
M. Kulikova, Image and Pervasive Access Lab., CNRS (Singapore); A. Veillard, Image and Pervasive Access Lab., CNRS (Singapore) and National Univ. of Singapore (Singapore); L. Roux, Image and Pervasive Access Lab., CNRS (Singapore) and Univ. Joseph Fourier (France); D. Racocanu, Image and Pervasive Access Lab., CNRS (Singapore), National Univ. of Singapore (Singapore), and Univ. Pierre et Marie Curie (France)
- 8314 29 **A framework of whole heart extracellular volume fraction estimation for low dose cardiac CT images** [8314-80]
X. Chen, R. M. Summers, M. S. Nacif, S. Liu, D. A. Bluemke, J. Yao, National Institutes of Health (United States)
- 8314 2A **Heart region segmentation from low-dose CT scans: an anatomy based approach** [8314-81]
A. P. Reeves, A. M. Biancardi, Cornell Univ. (United States); D. F. Yankelevitz, M. D. Cham, C. I. Henschke, The Mount Sinai Medical Ctr. (United States)
- 8314 2B **Enhanced detection of the vertebrae in 2D CT-images** [8314-82]
F. Graf, R. Greil, H.-P. Kriegel, M. Schubert, Ludwig-Maximilians-Univ. München (Germany); A. Cavallaro, Imaging Science Institute Erlangen (Germany)
- 8314 2C **Metastatic liver tumor detection from 3D CT images using a level set algorithm with liver-edge term** [8314-83]
J. Miyakoshi, S. Yui, K. Matsuzaki, T. Irie, Hitachi, Ltd. (Japan)
- 8314 2D **Fully automatic vertebra detection in x-ray images based on multi-class SVM** [8314-84]
F. Lecron, M. Benjelloun, S. Mahmoudi, Univ. of Mons (Belgium)

- 8314 2E **Local label learning (L3) for multi-atlas based segmentation** [8314-85]
Y. Hao, Institute of Automation (China); J. Liu, Y. Duan, X. Zhang, Xuanwu Hospital of Capital Medical Univ. (China); C. Yu, Tianjin Medical Univ. General Hospital (China); T. Jiang, Y. Fan, Institute of Automation (China)
- 8314 2F **Automated anatomical labeling method for abdominal arteries extracted from 3D abdominal CT images** [8314-86]
M. Oda, B. H. Hoang, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); K. Misawa, Aichi Cancer Ctr. Research Institute (Japan); M. Fujiwara, K. Mori, Nagoya Univ. (Japan)
- 8314 2G **Computerized analysis of pelvic incidence from 3D images** [8314-87]
T. Vrtovec, Univ. of Ljubljana (Slovenia); M. M. A. Janssen, Univ. Medical Ctr. Utrecht (Netherlands); F. Pernuš, Univ. of Ljubljana (Slovenia); R. M. Castelein, M. A. Viergeever, Univ. Medical Ctr. Utrecht (Netherlands)
- 8314 2H **Incorporation of physical constraints in optimal surface search for renal cortex segmentation** [8314-88]
X. Li, Institute of Automation (China); X. Chen, J. Yao, National Institute of Health (United States); X. Zhang, J. Tian, Institute of Automation (China)
- 8314 2I **A parametric statistic model and fast algorithm for brain MR image segmentation and bias correction** [8314-89]
T. Zhan, Z. Wei, L. Xiao, L. Qian, Nanjing Univ. of Science & Technology (China)
- 8314 2J **Live-wire-based segmentation of 3D anatomical structures for image-guided lung interventions** [8314-90]
K. Lu, Philips Research North America (United States); S. Xu, National Institutes of Health (United States); Z. Xue, S. T. Wong, Methodist Hospital Research Institute (United States)

Part Two

- 8314 2K **Semi-automatic intracranial tumor segmentation and tumor tissue classification based on multiple MR protocols** [8314-91]
A. Franz, Philips Research (Germany); H. Tschampa, A. Müller, Univ. Hospital Bonn (Germany); S. Remmele, C. Stehning, J. Keupp, Philips Research (Germany); J. Gieseke, Philips Healthcare (Germany); H. H. Schild, P. Mürtz, Univ. Hospital Bonn (Germany)
- 8314 2L **A multi-dimensional model for localization of highly variable objects** [8314-92]
H. Ruppertshofen, Univ. of Applied Sciences Kiel (Germany) and Otto-von-Guericke-Univ. Magdeburg (Germany); T. Bülow, J. von Berg, Philips Research Labs. (Germany); S. Schmidt, Univ. of Applied Sciences Wildau (Germany) and Otto-von-Guericke-Univ. Magdeburg (Germany); P. Beyerlein, Univ. of Applied Sciences Wildau (Germany); Z. Salah, G. Rose, Otto-von-Guericke Univ. Magdeburg (Germany); H. Schramm, Univ. of Applied Sciences Kiel (Germany)

- 8314 2M **Improving semi-automated segmentation by integrating learning with active sampling** [8314-93]
J. Huo, Univ. of California, Los Angeles (United States); K. Okada, San Francisco State Univ. (United States); M. Brown, Univ. of California, Los Angeles (United States)
- 8314 2N **Robust lumen segmentation of coronary arteries in 2D angiographic images** [8314-94]
M. Polyanskaya, C. Schwemmer, A. Linarth, Friedrich-Alexander-Univ. Erlangen-Nuremberg (Germany); G. Lauritsch, Siemens AG (Germany); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nuremberg (Germany)
- 8314 2O **Extraction of liver volumetry based on blood vessel from the portal phase CT dataset** [8314-95]
A. S. Maklad, M. Matsuhira, H. Suzuki, Y. Kawata, N. Niki, T. Utsunomiya, M. Shimada, Univ. of Tokushima (Japan)
- 8314 2P **Segmentation of the pectoral muscle in breast MR images using structure tensor and deformable model** [8314-96]
M. Lee, Seoul National Univ. (Korea, Republic of); J. H. Kim, Seoul National Univ. (Korea, Republic of)
- 8314 2Q **A new prostate segmentation approach using multispectral magnetic resonance imaging and a statistical pattern classifier** [8314-97]
B. Maan, F. van der Heijden, Univ. of Twente (Netherlands); J. J. Fütterer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
- 8314 2R **Design of spectral filtering for tissue classification** [8314-98]
A. Narayanan, P. Shah, B. Das, GE Global Research (India)
- 8314 2S **Robust left ventricular myocardium segmentation for multi-protocol MR** [8314-99]
A. Groth, J. Weese, H. Lehmann, Philips Research Labs. (Germany)
- 8314 2T **Supervised classification of brain tissues through local multi-scale texture analysis by coupling DIR and FLAIR MR sequences** [8314-100]
E. Poletti, E. Veronese, M. Calabrese, A. Bertoldo, E. Grisan, Univ. of Padova (Italy)
- 8314 2U **Fast automatic algorithm for bifurcation detection in vascular CTA scans** [8314-101]
M. Brozio, V. Gorbunova, C. Godenschwager, Siemens Healthcare (Germany); T. Beck, Siemens Healthcare (Germany) and Karlsruhe Institute of Technology (Germany); D. Bernhardt, Siemens Healthcare (Germany)
- 8314 2V **Pulmonary lobe segmentation with level sets** [8314-103]
A. Schmidt-Richberg, J. Ehrhardt, M. Wilms, R. Werner, H. Handels, Univ. of Lübeck (Germany)
- 8314 2W **Multi-level tree analysis of pulmonary artery/vein trees in non-contrast CT images** [8314-104]
Z. Gao, R. W. Grout, E. A. Hoffman, P. K. Saha, The Univ. of Iowa (United States)
- 8314 2X **Binary image representation by contour trees** [8314-105]
D. B. Aydogan, J. Hyttinen, Tampere Univ. of Technology (Finland)

- 8314 2Y **An automated multi-modal object analysis approach to coronary calcium scoring of adaptive heart isolated MSCT images** [8314-106]
J. Wu, Univ. of Surrey (United Kingdom); G. Ferns, Keele Univ. (United Kingdom); J. Giles, Conquest Hospital (United Kingdom); E. Lewis, Univ. of Surrey (United Kingdom)
- 8314 2Z **Three dimensional multi-scale visual words for texture-based cerebellum segmentation** [8314-107]
A. Foncubierta-Rodríguez, Univ. of Applied Sciences Western Switzerland (Switzerland); A. Depeursinge, Univ. of Applied Sciences Western Switzerland (Switzerland) and Univ. Hospital of Geneva (Switzerland); L. Gui, Univ. Hospital of Geneva (Switzerland); H. Müller, Univ. of Applied Sciences Western Switzerland (Switzerland) and Univ. Hospital of Geneva (Switzerland)
- 8314 30 **Finding seeds for segmentation using statistical fusion** [8314-108]
F. Xing, The Johns Hopkins Univ. (United States); A. J. Asman, Vanderbilt Univ. (United States); J. L. Prince, The Johns Hopkins Univ. (United States); B. A. Landman, Vanderbilt Univ. (United States) and The Johns Hopkins Univ. (United States)
- 8314 32 **Watershed-based segmentation of the corpus callosum in diffusion MRI** [8314-110]
P. Freitas, L. Rittner, S. Appenzeller, A. Lapa, R. Lotufo, Univ. of Campinas (Brazil)
- 8314 33 **Computational intelligence techniques for identifying the pectoral muscle region in mammograms** [8314-111]
H. E. Rickard, R. G. Villao, Coastal Carolina Univ. (United States); A. S. Elmaghraby, Univ. of Louisville (United States)
- 8314 34 **GrowCut-based fast tumor segmentation for 3D magnetic resonance images** [8314-112]
T. Yamasaki, Cornell Univ. (United States), The Univ. of Tokyo (Japan), and Japan Society for the Promotion of Science (Japan); T. Chen, Cornell Univ. (United States); M. Yagi, Osaka Univ. (Japan); T. Hirai, R. Murakami, Kumamoto Univ. (Japan)
- 8314 35 **Automatic detection of significant and subtle arterial lesions from coronary CT angiography** [8314-113]
D. Kang, Univ. of Southern California (United States); P. Slomka, R. Nakazato, V. Y. Cheng, J. K. Min, D. Li, D. S. Berman, Cedars-Sinai Medical Ctr. (United States); C.-C. J. Kuo, Univ. of Southern California (United States); D. Dey, Cedars-Sinai Medical Ctr. (United States)
- 8314 36 **Automatic segmentation of the liver using multi-planar anatomy and deformable surface model in abdominal contrast-enhanced CT images** [8314-114]
Y. Jang, H. Hong, Seoul Women's Univ. (Korea, Republic of); J. W. Chung, Y. H. Yoon, Seoul National Univ. Hospital (Korea, Republic of)
- 8314 37 **A novel approach for three dimensional dendrite spine segmentation and classification** [8314-115]
T. He, Z. Xue, S. T. C. Wong, Methodist Hospital Research Institute (United States)
- 8314 38 **Segmentation algorithm of colon based on multi-slice CT colonography** [8314-116]
Y. Hu, M. S. Ahamed, E. Takahashi, H. Suzuki, Y. Kawata, N. Niki, Univ. of Tokushima (Japan); M. Suzuki, G. Iinuma, N. Moriyama, National Cancer Ctr. (Japan)

- 8314 39 **Automatic segmentation and analysis of fibrin networks in 3D confocal microscopy images** [8314-117]
X. Liu, J. Mu, Univ. of Notre Dame (United States); K. R. Machlus, A. S. Wolberg, Univ. of North Carolina at Chapel Hill (United States); E. D. Rosen, Indiana Univ. School of Medicine (United States); Z. Xu, M. S. Alber, D. Z. Chen, Univ. of Notre Dame (United States)
- 8314 3A **Placental fetal stem segmentation in a sequence of histology images** [8314-118]
P. Athavale, Univ. of Toronto (Canada); L. A. Vese, Univ. of California, Los Angeles (United States)
- 8314 3B **Fully automated 3D prostate central gland segmentation in MR images: a LOGISMOS based approach** [8314-119]
Y. Yin, S. V. Fotin, S. Periaswamy, J. Kunz, H. Haldankar, N. Muradyan, iCAD, Inc. (United States); B. Turkbey, P. Choyke, National Cancer Institute (United States)
- 8314 3C **A unifying graph-cut image segmentation framework: algorithms it encompasses and equivalences among them** [8314-120]
K. C. Ciesielski, West Virginia Univ. (United States) and The Univ. of Pennsylvania (United States); J. K. Udupa, The Univ. of Pennsylvania Health System (United States); A. X. Falcão, Univ. of Campinas (Brazil); P. A. V. Miranda, Univ. of São Paulo (Brazil)
- 8314 3D **Automatic 3D segmentation of the kidney in MR images using wavelet feature extraction and probability shape model** [8314-121]
H. Akbari, B. Fei, Emory Univ. (United States) and Georgia Institute of Technology (United States)
- 8314 3E **Automatic organ segmentation on torso CT images by using content-based image retrieval** [8314-122]
X. Zhou, A. Watanabe, Gifu Univ. School of Medicine (Japan); X. Zhou, Nagoya Bunri Univ. (Japan); T. Hara, Gifu Univ. School of Medicine (Japan); R. Yokoyama, M. Kanematsu, Gifu Univ. Hospital (Japan); H. Fujita, Gifu Univ. School of Medicine (Japan)
- 8314 3F **An improved fuzzy c-means algorithm for unbalanced sized clusters** [8314-123]
S. Gu, J. Liu, Q. Xie, L. Wang, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China)
- 8314 3G **Graph representation of hepatic vessel based on centerline extraction and junction detection** [8314-124]
X. Zhang, J. Tian, Institute of Automation (China); K. Deng, Xidian Univ. (China); X. Li, F. Yang, Institute of Automation (China)
- 8314 3H **Vessel centerline extraction in phase-contrast MR images using vector flow information** [8314-125]
Y.-J. Jeong, Karlsruher Institute of Technology (Germany); S. Ley, Univ. Hospital Heidelberg (Germany) and Univ. of Toronto (Canada); R. Dillmann, R. Unterhinninghofen, Karlsruher Institute of Technology (Germany)
- 8314 3I **A fuzzy clustering vessel segmentation method incorporating line-direction information** [8314-186]
Z. Wang, W. Xiong, W. Huang, J. Zhou, A*STAR Institute for Infocomm Research (Singapore); S. K. Venkatesh, National Univ. of Singapore School of Medicine (Singapore)

POSTER SESSION: SHAPE

- 8314 3K **A framework for longitudinal data analysis via shape regression** [8314-127]
J. Fishbaugh, S. Durrleman, 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)
- 8314 3L **3D reconstruction of the scapula from biplanar radiographs** [8314-128]
P. Y. Lagacé, T. Cresson, N. Hagemester, Ecole de Technologie Supérieure (Canada); F. Billuart, X. Ohl, Ecole Nationale Supérieure d'Arts et Métiers (France); J. de Guise, Ecole de Technologie Supérieure (Canada); W. Skalli, Ecole Nationale Supérieure d'Arts et Métiers (France)
- 8314 3M **A shape-based statistical method to retrieve 2D TRUS-MR slice correspondence for prostate biopsy** [8314-129]
J. Mitra, Le2i, CNRS, Univ. de Bourgogne (France) and Univ. de Girona (Spain); A. Srikantha, D. Sidibé, Le2i, CNRS, Univ. de Bourgogne (France); R. Martí, A. Oliver, X. Lladó, Univ. de Girona (Spain); S. Ghose, Le2i, CNRS, Univ. de Bourgogne (France) and Univ. de Girona (Spain); J. C. Vilanova, Girona Magnetic Resonance Ctr. (Spain); J. Comet, Hospital Dr. Josep Trueta (Spain); F. Meriaudeau, Le2i, CNRS, Univ. de Bourgogne (France)
- 8314 3N **Shape-constrained multi-atlas based segmentation with multichannel registration** [8314-130]
Y. Hao, T. Jiang, Y. Fan, Institute of Automation (China)
- 8314 3O **Automated detection of pain from facial expressions: a rule-based approach using AAM** [8314-131]
Z. Chen, R. Ansari, D. J. Wilkie, Univ. of Illinois at Chicago (United States)

POSTER SESSION: IMAGE ENHANCEMENT

- 8314 3P **Tomographic reconstruction of Cerenkov photons in tissues through approximate message-passing** [8314-132]
J. Zhong, J. Tian, H. Liu, C. Qin, X. Yang, X. Ma, Institute of Automation (China)
- 8314 3Q **Quantization of reconstruction error with an interval-based algorithm: an experimental comparison** [8314-133]
A. Hassoun, O. Strauss, Lab. d'Informatique de Robotique et de Microelectronique de Montpellier, CNRS, Univ. Montpellier (France)
- 8314 3R **Blind local noise estimation for medical images reconstructed from rapid acquisition** [8314-134]
X. Pan, X. Zhang, S. Lyu, Univ. at Albany (United States)
- 8314 3S **Optimisation of reconstruction for the registration of CT liver perfusion sequences** [8314-135]
B. Romain, Philips Healthcare (France), Ecole Central Paris (France), and Lab. IBISC, Univ. d'Evry-Val (France); V. Letort, Ecole Centrale Paris (France); O. Lucidarme, Hospital La Pitié-Salpêtrière (France); F. d'Alché-Buc, Lab. IBISC, Univ. d'Evry-Val (France) and The National Institute for Research in Computer Science and Control, CNRS (France); L. Rouet, Philips Healthcare (France)

- 8314 3U **Image fusion in x-ray differential phase-contrast imaging** [8314-137]
W. Haas, M. Polyanskaya, F. Bayer, K. Gödel, H. Hofmann, J. Rieger, A. Ritter, T. Weber, L. Wucherer, J. Durst, T. Michel, G. Anton, J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 8314 3V **Super-resolution reconstruction in MRI: better images faster?** [8314-138]
E. Plenge, D. H. J. Poot, M. Bernsen, G. Kotek, G. Houston, P. Wielopolski, Erasmuc MC (Netherlands); L. van der Weerd, Leiden Univ. Medical Ctr. (Netherlands); W. J. Niessen, Erasmuc MC (Netherlands) and Delft Univ. of Technology (Netherlands); E. Meijering, Erasmuc MC (Netherlands)
- 8314 3W **An iterative hard thresholding algorithm for CS MRI** [8314-139]
S. R. Rajani, M. R. Reddy, Indian Institute of Technology Madras (India)
- 8314 3X **Image quality improvement through fusion of hybrid bone- and soft-tissue-texture filtering for 3D cone beam CT extremity imaging system** [8314-140]
D. Yang, R. A. Senn, N. Packard, J. Yorkston, D. H. Foos, Carestream Health, Inc. (United States)
- 8314 3Y **Quality evaluation for metal influenced CT data** [8314-141]
B. Kratz, S. Ens, C. Kaethner, J. Müller, T. M. Buzug, Univ. of Lübeck (Germany)
- 8314 3Z **Denoising of 4D cardiac micro-CT data using median-centric bilateral filtration** [8314-142]
D. Clark, G. A. Johnson, C. T. Badea, Duke Univ. Medical Ctr. (United States)
- 8314 40 **Confidence map-based super-resolution reconstruction** [8314-143]
W. El Hakimi, Technische Univ. Darmstadt (Germany); S. Wesarg, Cognitive Computing & Medical Imaging (IGD) (Germany)
- 8314 41 **Enhancing super-resolution reconstructed image quality in 3D MR images using simulated annealing** [8314-144]
S. ur Rahman, T. Vateva, Technische Univ. Darmstadt (Germany); S. Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany)
- 8314 42 **A novel iterative non-local means algorithm for speckle reduction** [8314-145]
Y. Zhan, X. Zhang, M. Ding, Huazhong Univ. of Science and Technology (China)
- 8314 43 **Additive Dirichlet models for projectional images** [8314-147]
S. Williams, M. J. Bottema, Flinders Univ. (Australia)
- 8314 44 **Prediction coefficient estimation in Markov random fields for iterative x-ray CT reconstruction** [8314-148]
J. Wang, K. Sauer, Univ. of Notre Dame (United States); J.-B. Thibault, Z. Yu, GE Healthcare (United States); C. Bouman, Purdue Univ. (United States)

POSTER SESSION: NEURO APPLICATIONS

- 8314 45 **Glial brain tumor detection by using symmetry analysis** [8314-149]
V. Padoia, E. Binaghi, S. Balbi, A. De Benedictis, E. Monti, Univ. degli Studi dell'Insubria (Italy); R. Minotto, Ospedale di Circolo Fondazione Macchi Varese (Italy)

- 8314 46 **Automatic segmentation of white matter hyperintensities robust to multicentre acquisition and pathological variability** [8314-150]
T. Samaille, O. Colliot, R. Cuingnet, Univ. Pierre et Marie Curie (France), INSERM (France), Ctr. National de la Recherche Scientifique (France), and ICM - Institut du Cerveau et de la Moëlle épinière (France); E. Jouvent, H. Chabriat, Hopital Lariboisière (France); D. Dormont, M. Chupin, Univ. Pierre et Marie Curie (France), INSERM (France), Ctr. National de la Recherche Scientifique (France), and CHU Lariboisière (France)
- 8314 47 **Labeling of the cerebellar peduncles using a supervised Gaussian classifier with volumetric tract segmentation** [8314-151]
C. Ye, The Johns Hopkins Univ. (United States); P.-L. Bazin, Max-Planck-Institute for Human Cognitive and Brain Sciences (Germany); J. A. Bogovic, The Johns Hopkins Univ. (United States); S. H. Ying, The Johns Hopkins Univ. School of Medicine (United States); J. L. Prince, The Johns Hopkins Univ. (United States)
- 8314 48 **Intracranial aneurysm growth quantification in CTA** [8314-152]
A. Firouzian, Erasmus MC (Netherlands); R. Manniesing, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); C. T. Metz, S. Klein, Erasmus MC (Netherlands); B. K. Velthuis, G. J. E. Rinkel, Univ. Medical Ctr. Utrecht (Netherlands); A. van der Lugt, Erasmus MC (Netherlands); W. J. Niessen, Erasmus MC (Netherlands) and Delft Univ. of Technology (Netherlands)
- 8314 49 **A field map estimation strategy without the noise-bandwidth tradeoff** [8314-153]
J. Dagher, Massachusetts General Hospital (United States) and Harvard Medical School (United States); A. Bilgin, The Univ. of Arizona (United States)
- 8314 4A **Fiber estimation errors incurred from truncated sampling in q-space diffusion magnetic resonance imaging** [8314-154]
B. Wilkins, N. Lee, M. Singh, The Univ. of Southern California (United States)
- 8314 4B **Brain tissue segmentation in 4D CT using voxel classification** [8314-155]
R. van den Boom, M. T. H. Oei, S. Lafebre, L. J. Oostveen, F. J. A. Meijer, S. C. A. Steens, M. Prokop, B. van Ginneken, R. Manniesing, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
- 8314 4C **Discriminating between brain rest and attention states using fMRI connectivity graphs and subtree SVM** [8314-156]
F. Mokhtari, S. K. Bakhtiari, G. A. Hossein-Zadeh, Univ. of Tehran (Iran, Islamic Republic of); H. Soltanian-Zadeh, Univ. of Tehran (Iran, Islamic Republic of) and Henry Ford Health System (United States)
- 8314 4D **MITK global tractography** [8314-157]
P. F. Neher, B. Stieltjes, German Cancer Research Ctr. (Germany); M. Reisert, Univ. Hospital Freiburg (Germany); I. Reicht, H.-P. Meinzer, K. H. Fritzsche, German Cancer Research Ctr. (Germany)
- 8314 4E **ISMI: a classification index for high angular resolution diffusion imaging** [8314-158]
D. Röttger, D. Dudai, Univ. of Koblenz-Landau (Germany); D. Merhof, Univ. of Konstanz (Germany); S. Müller, Univ. of Koblenz-Landau (Germany)

- 8314 4F **Intrinsic functional connectivity pattern-based brain parcellation using normalized cut** [8314-159]
H. Cheng, D. Song, Institute of Automation (China); H. Wu, Univ. of Electronic Science and Technology of China (China); Y. Fan, Institute of Automation (China)
- 8314 4G **Accelerated diffusion spectrum imaging via compressed sensing for the human connectome project** [8314-160]
N. Lee, B. Wilkins, M. Singh, The Univ. of Southern California (United States)
- 8314 4H **Mesial temporal lobe epilepsy lateralization using SPHARM-based features of hippocampus and SVM** [8314-161]
M. Esmailzadeh, The Australian National Univ. (Australia) and Univ. of Tehran (Iran, Islamic Republic of); H. Soltanian-Zadeh, Univ. of Tehran (Iran, Islamic Republic of) and Henry Ford Hospital (United States); K. Jafari-Khouzani, Henry Ford Hospital (United States)
- 8314 4I **Segmentation of the optic tracts using graph-based techniques** [8314-162]
J. H. Noble, P.-F. D'Haese, B. M. Dawant, Vanderbilt Univ. (United States)
- 8314 4J **Detection of abrupt motion in DCE-MRI** [8314-163]
K. Rajamani, D. Shanbhag, R. Mullick, S. Ranjan, U. Patil, GE Global Research (India); S. N. Gupta, GE Global Research (United States)
- 8314 4K **Retinal vessel width measurement at branching points using an improved electric field theory-based graph approach** [8314-165]
X. Xu, The Univ. of Iowa (United States); M. D. Abramoff, The Univ. of Iowa (United States) and Veteran's Administration Medical Ctr. (United States); G. Bertelsen, Univ. of Tromsø (Norway); J. M. Reinhardt, The Univ. of Iowa (United States)

POSTER SESSION: COMPRESSIVE SENSING

- 8314 4M **Multi-slice and multi-frame image reconstruction by predictive compressed sensing** [8314-167]
J. Zhang, J. Wang, G. Xu, Univ. of Wisconsin-Milwaukee (United States); J.-B. Thibault, GE Healthcare (United States)
- 8314 4N **Compressed sensing for phase-contrast computed tomography (Cum Laude Poster Award)** [8314-168]
T. Gaass, G. Potdevin, M. Bech, J. Herzen, M. Willner, P. B. Noël, A. Tapfer, F. Pfeiffer, A. Haase, Technische Univ. München (Germany)
- 8314 4O **A feasibility study for compressed sensing combined phase contrast MR angiography reconstruction** [8314-169]
D.-H. Lee, C.-P. Hong, Yonsei Univ. (Korea, Republic of); M.-W. Lee, Genpia Co. (Korea, Republic of); B.-S. Han, Yonsei Univ. (Korea, Republic of)
- 8314 4P **Quality assessment of fast wavelet-encoded MRI utilizing compressed sensing** [8314-170]
Z. Liu, B. Nutter, S. Mitra, Texas Tech Univ. (United States)

POSTER SESSION: FUNCTIONAL IMAGING

- 8314 4Q **Rician compressed sensing for fast and stable signal reconstruction in diffusion MRI** [8314-171]
S. Dolui, A. Kuurstra, O. V. Michailovich, Univ. of Waterloo (Canada)
- 8314 4R **Model-based blood flow quantification from DSA: quantitative evaluation on patient data and comparison with TCCD** [8314-172]
I. Waechter-Stehle, A. Groth, Philips Research Labs. (Germany); T. Bruijns, Philips Healthcare (Netherlands); O. Brina, Univ. Hospital of Geneva (Switzerland); D. A. Ruefenacht, Z. Kulcsar, Clinic Hirslanden (Switzerland); V. Mendes-Pereira, F. Perren, Univ. Hospital of Geneva (Switzerland); D. J. Hawkes, Univ. College London (United Kingdom); J. Weese, Philips Research Labs. (Germany)
- 8314 4S **Identification of subject specific and functional consistent ROIs using semi-supervised learning** [8314-173]
Y. Du, H. Li, Institute of Automation (China); H. Wu, Univ. of Electronic Science and Technology of China (China); Y. Fan, Institute of Automation (China)
- 8314 4T **ADHD classification using bag of words approach on network features** [8314-174]
B. Solmaz, S. Dey, Univ. of Central Florida (United States); A. R. Rao, IBM Thomas J. Watson Research Ctr. (United States); M. Shah, Univ. of Central Florida (United States)
- 8314 4U **Measurement of glucose concentration by image processing of thin film slides** [8314-175]
S. Piramanayagam, E. Saber, Rochester Institute of Technology (United States); D. Heavner, Ortho Clinical Diagnostics, Inc. (United States)

POSTER SESSION: CLASSIFICATION

- 8314 4V **Cascaded classifier for large-scale data applied to automatic segmentation of articular cartilage** [8314-176]
A. Prasoon, C. Igel, Univ. of Copenhagen (Denmark); M. Loog, Univ. of Copenhagen (Denmark) and Delft Univ. of Technology (Netherlands); F. Lauze, Univ. of Copenhagen (Denmark); E. Dam, BioMed IQ (Denmark); M. Nielsen, Univ. of Copenhagen (Denmark) and BioMed IQ (Denmark)
- 8314 4W **Digitized tissue microarray classification using sparse reconstruction** [8314-177]
F. Xing, Rutgers, The State Univ. of New York (United States), Robert Wood Johnson Medical School (United States), and Univ. of Kentucky (United States); B. Liu, Rutgers, The State Univ. of New York (United States) and Univ. of Kentucky (United States); X. Qi, D. J. Foran, Robert Wood Johnson Medical School (United States); L. Yang, Univ. of Kentucky (United States)
- 8314 4X **Global pattern analysis and classification of dermoscopic images using textons** [8314-178]
M. Sadeghi, T. K. Lee, Simon Fraser Univ. (Canada), BC Cancer Agency (Canada), and The Univ. of British Columbia (Canada); D. McLean, H. Lui, BC Cancer Agency (Canada) and The Univ. of British Columbia (Canada); M. S. Atkins, Simon Fraser Univ. (Canada)
- 8314 4Y **Texture analysis using Minkowski functionals** [8314-179]
X. Li, P. R. S. Mendonça, R. Bhotika, GE Global Research (United States)

- 8314 4Z **A novel online Variance Based Instance Selection (VBIS) method for efficient atypicality detection in chest radiographs** [8314-185]
M. Alzubaidi, V. Balasubramanian, CUbiC, Arizona State Univ. (United States); A. Patel, Mayo Clinic (United States); S. Panchanathan, J. A. Black, Jr., CUbiC, Arizona State Univ. (United States)

POSTER SESSION: MOTION

- 8314 50 **Low bandwidth eye tracker for scanning laser ophthalmoscopy** [8314-180]
Z. G. Harvey, Flaum Eye Institute, Univ. of Rochester (United States) and Rochester Institute of Technology (United States); A. Dubra, Medical College of Wisconsin (United States) and Univ. of Rochester (United States); N. D. Cahill, S. Lopez Alarcon, Rochester Institute of Technology (United States)
- 8314 51 **Estimation of trabecular thickness in gray-scale images through granulometric analysis** [8314-181]
R. Moreno, M. Borga, Ö. Smedby, Linköping Univ. (Sweden)
- 8314 52 **SinoCor: motion correction in SPECT** [8314-182]
D. Mitra, D. Eiland, M. Abdallah, Florida Institute of Technology (United States); R. Bouthcko, G. T. Gullberg, Lawrence Berkeley National Lab. (United States); N. Schechtmann, MIMA, Melbourne (United States)
- 8314 53 **Automatic analysis of ciliary beat frequency using optical flow** [8314-183]
M. Figl, Medical Univ. Vienna (Austria); M. Lechner, Univ. of Applied Sciences Technikum Wien (Austria); T. Werther, F. Horak, Medical Univ. Vienna (Austria); J. Hummel, Medical Univ. Vienna (Austria) and Wilhelminenspital (Austria); W. Birkfellner, Medical Univ. Vienna (Austria)
- 8314 54 **Four-dimensional non-rigid cardiac motion estimation** [8314-184]
Q. Tang, J. Cammin, S. Srivastava, K. Taguchi, The Johns Hopkins Univ. School of Medicine (United States)

Author Index

Conference Committee

Symposium Chairs

Joseph M. Reinhardt, The University of Iowa (United States)
Nico Karssemeijer, Radboud University Nijmegen Medical Center
(Netherlands)

Conference Chairs

David R. Haynor, University of Washington (United States)
Sébastien Ourselin, University College London (United Kingdom)

Program Committee

Mostafa Analoui, The Livingston Group (United States)
Elsa D. Angelini, Telecom ParisTech (France)
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)
Bernd Fischer, Universität zu Lübeck (Germany)
Alejandro Federico Frangi, Universitat Pompeu Fabra (Spain)
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)
Tobias Heimann, Deutsches Krebsforschungszentrum (Germany)
Bennett A. Landman, Vanderbilt University (United States)
Tianhu Lei, University of Pittsburgh Medical Center (United States)
Boudewijn Lelieveldt, Leids Universitair Medisch Centrum (Netherlands)
Boštjan Likar, University of Ljubljana (Slovenia)
Murray 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 J. Niessen, Erasmus MC (Netherlands)
Josien P. Pluim, University Medical Center Utrecht (Netherlands)

Jerry L. Prince, The Johns Hopkins University (United States)
Daniel Rueckert, Imperial College London (United Kingdom)
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)
Colin Studholme, University of Washington (United States)
Martin A. Styner, The University of North Carolina at Chapel Hill School of Medicine (United States)
Philippe Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland)
Jayaram K. Udupa, The University of Pennsylvania Health System (United States)
Andreas Wahle, The University of Iowa (United States)

Session Chairs

- 1 Segmentation I
Tobias Heimann, Deutsches Krebsforschungszentrum (Germany)
- 2 Registration I
Daniel Rueckert, Imperial College London (United Kingdom)
- 3 Keynote and Cardiac Applications
Sébastien Ourselin, University College London (United Kingdom)
David R. Haynor, University of Washington (United States)
- 4 Diffusion Imaging
James C. Gee, University of Pennsylvania (United States)
- 5 Shape: Applications and Methods
Mads Nielsen, University of Copenhagen (Denmark)
- 6 Segmentation II
Jerry L. Prince, Johns Hopkins University (United States)
- 7 Label Fusion
Bennett A. Landman, Vanderbilt University (United States)
- 8 Brain Applications
Martin A. Styner, The University of North Carolina at Chapel Hill (United States)
- 9 Registration II
Benoit M. Dawant, Vanderbilt University (United States)

- 10 OCT and Ultrasound
Aaron Fenster, Robarts Research Institute (Canada)
- 11 Segmentation of Vessels and Tubular Structures
Cristian Lorenz, Philips Research (Germany)
- 12 Digital Pathology I
Metin N. Gurcan, The Ohio State University Medical Center
(United States)
Anant Madabhushi, Rutgers, The State University of New Jersey
(United States)
- 13 Digital Pathology II
Metin N. Gurcan, The Ohio State University Medical Center
(United States)
Anant Madabhushi, Rutgers, The State University of New Jersey
(United States)
- Poster Session
Bernd Fischer, Universität Lübeck (Germany)
Murray Loew, The George Washington University (United States)

