Front Matter: Volume 9035
Medical Imaging 2014

Computer-Aided Diagnosis

Stephen Aylward
Lubomir M. Hadjiiski

Editors

18–20 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 9035
Part One of Two Parts

Proc. of SPIE Vol. 9035, 903501 · © 2014 SPIE · CCC code: 1605-7422/14/$18 · doi: 10.1117/12.2064848
Contents

Part One

  xix  Conference Committee

  xxiii  2014 Medical Imaging Paper Award Recipients

HEAD, NECK, AND NOVEL METHODS

9035 02  Early detection of Alzheimer’s disease using histograms in a dissimilarity-based classification framework [9035-79]
A. Luchtenberg, R. Simões, MIRA Institute for Biomedical Technology and Technical Medicine, Univ. Twente (Netherlands); A.-M. van Cappellen van Walsum, MIRA Institute for Biomedical Technology and Technical Medicine, Univ. Twente (Netherlands) and Radboud Univ. Nijmegen Medical Ctr. (Netherlands); C. H. Slump, MIRA Institute for Biomedical Technology and Technical Medicine, Univ. Twente (Netherlands)

9035 03  Multi-fractal texture features for brain tumor and edema segmentation [9035-2]
S. Reza, K. M. Iftekharuddin, Old Dominion Univ. (United States)

9035 04  Ischemic stroke lesion segmentation in multi-spectral MR images with support vector machine classifiers [9035-3]
O. Maier, M. Wilms, J. von der Gablentz, U. Krämer, H. Handels, Univ. zu Lübeck (Germany)

9035 05  A ROC-based feature selection method for computer-aided detection and diagnosis [9035-4]
S. Wang, Fourth Military Medical Univ. (China) and Xidian Univ. (China); G. Zhang, Q. Liao, Fourth Military Medical Univ. (China); J. Zhang, Xidian Univ. (China); C. Jiao, H. Lu, Fourth Military Medical Univ. (China)

9035 06  Change detection of medical images using dictionary learning techniques and PCA [9035-5]
V. Nika, York Univ. (Canada); P. Babyn, Univ. of Saskatchewan (Canada); H. Zhu, York Univ. (Canada)

9035 07  Segmentation and automated measurement of chronic wound images: probability map approach [9035-6]
M. F. Ahmad Fauzi, The Ohio State Univ. (United States) and Multimedia Univ. (Malaysia); I. Khansa, K. Catignani, G. Gordillo, The Ohio State Univ. (United States) C. K. Sen, The Ohio State Univ. Wexner Medical Ctr. (United States) and The Ohio State Univ. (United States) M. N. Gurcan, The Ohio State Univ. (United States)
9035 08  Reference-tissue correction of T2-weighted signal intensity for prostate cancer detection [9035-7]
Y. Peng, The Univ. of Chicago (United States) and Beijing Jiaotong Univ. (China); Y. Jiang, A. Oto, The Univ. of Chicago (United States)

9035 09  Computer extracted texture features on T2w MRI to predict biochemical recurrence following radiation therapy for prostate cancer [9035-8]
S. B. Ginsburg, M. Rusu, Case Western Reserve Univ. (United States); J. Kurhanewicz, Univ. of California, San Francisco (United States); A. Madabhushi, Case Western Reserve Univ. (United States)

9035 0A  Multi-atlas propagation via a manifold graph on a database of both labeled and unlabeled images [9035-9]
Q. Gao, T. Tong, D. Rueckert, P.J. Edwards, Imperial College London (United Kingdom)

9035 0B  Automated polyp measurement based on colon structure decomposition for CT colonography [9035-10]
H. Wang, The State Univ. of New York (United States); L. C. Li, College of Staten Island, SUNY (United States); H. Han, H. Peng, B. Song, The State Univ. of New York (United States); X. Wei, New York City College of Technology (United States); Z. Liang, The State Univ. of New York (United States)

9035 0C  An improved high order texture features extraction method with application to pathological diagnosis of colon lesions for CT colonography [9035-11]
B. Song, Stony Brook Medicine (United States) and Stony Brook Univ. (United States); G. Zhang, H. Lu, Fourth Military Medical Univ. (China); H. Wang, F. Han, Stony Brook Medicine (United States); W. Zhu, Stony Brook Univ. (United States); Z. Liang, Stony Brook Medicine (United States)

VESSELS, HEART, AND EYE I

9035 0D  An image-based software tool for screening retinal fundus images using vascular morphology and network transport analysis [9035-12]
R. D. Clark, Constallation Research, Inc. (United States); D. J. Dickrell, Univ. of Florida (United States); D. L. Meadows, Constallation Research, Inc. (United States)

9035 0E  An automatic machine learning system for coronary calcium scoring in clinical non-contrast enhanced, ECG-triggered cardiac CT [9035-13]

9035 0F  Automated coronary artery calcification detection on low-dose chest CT images [9035-14]
Y. Xie, Cornell Univ. (United States); M. D. Cham, C. Henschke, D. Yankelevitz, Icahn School of Medicine at Mount Sinai Hospital (United States); A. P. Reeves, Cornell Univ. (United States)
9035 0G  Supervised pixel classification for segmenting geographic atrophy in fundus autofluorescence images [9035-15]
Z. Hu, Doheny Eye Institute (United States); G. G. Medioni, M. Hernandez, The Univ. of Southern California (United States); S. R. Sadda, Doheny Eye Institute (United States) and The Univ. of Southern California (United States)

LUNG, CHEST, AND ABDOMEN I

9035 0I  Detection, modeling and matching of pleural thickenings from CT data towards an early diagnosis of malignant pleural mesothelioma [9035-17]
K. Chaiaaowong, RWTH Aachen (Germany) and King Mongkut's Univ. of Technology (Thailand); T. Kraus, Univ. Hospital Aachen, RWTH Aachen Univ. (Germany)

9035 0J  Automatic localization of IASLC-defined mediastinal lymph node stations on CT images using fuzzy models [9035-18]
M. M. S. Matsumoto, N. G. Beig, J. K. Udupa, S. Archer, D. A. Torigian, Univ. of Pennsylvania (United States)

9035 0K  Computer-aided detection of malpositioned endotracheal tubes in portable chest radiographs [9035-19]
Z. Huo, Carestream Health, Inc. (United States); H. Mao, Rochester Institute of Technology (United States); J. Zhang, Carestream Health, Inc. (United States); A.-M. Sykes, Mayo Clinics (United States); S. Munn, Tufts Medical Ctr. (United States); J. Wandtke, Univ. of Rochester Medical Ctr. (United States)

9035 0L  Artificial neural networks for automatic modelling of the pectus excavatum corrective prosthesis [9035-20]
P. L. Rodrigues, A. H. J. Moreira, ICVS/3B's (Portugal) and Univ. do Minho (Portugal); N. F. Rodrigues, ICVS/3B's (Portugal) and Polytechnic Institute of Cávado and Ave (Portugal); A. Pinho, J. C. Fonseca, Univ. do Minho (Portugal); J. Correia-Pinto, ICVS/3B's (Portugal); J. L. Vilaça, ICVS/3B's (Portugal) and Polytechnic Institute of Cávado and Ave (Portugal)

9035 0M  Mediastinal lymph node detection on thoracic CT scans using spatial prior from multi-atlas label fusion [9035-21]
J. Liu, J. Zhao, J. Hoffman, J. Yao, W. Zhang, E. B. Turkbey, S. Wang, C. Kim, R. M. Summers, National Institutes of Health (United States)

9035 0N  Estimation of cartilaginous region in noncontrast CT of the chest [9035-22]
Q. Zhao, N. Safdar, Children's National Medical Ctr. (United States); G. Yu, Children's National Medical Ctr. (United States) and Princeton Univ. (United States); E. Myers, A. Sandier, M. G. Linguraru, Children's National Medical Ctr. (United States)

VESSELS, HEART, AND EYE II

9035 0O  A joint estimation detection of Glaucoma progression in 3D spectral domain optical coherence tomography optic nerve head images [9035-113]
A. Belghith, C. Bowd, R. N. Weinreb, L. M. Zangwill, Hamilton Glaucoma Ctr., Univ. of California, San Diego (United States)
Automated aortic calcification detection in low-dose chest CT images [9035-24]
Y. Xie, Cornell Univ. (United States); Y. M. Htwe, Icahn School of Medicine at Mount Sinai Hospital (United States); J. Padgett, Cornell Univ. (United States); C. Henschke, D. Yankelevitz, Icahn School of Medicine at Mount Sinai Hospital (United States); A. P. Reeves, Cornell Univ. (United States)

Segmentation and separation of venous vasculatures in liver CT images [9035-25]
L. Wang, C. Hansen, S. Zidowitz, H. K. Hahn, Fraunhofer MEVIS (Germany)

Computerized luminal analysis for detection of non-calcified plaques in coronary CT angiography [9035-26]
J. Wei, C. Zhou, H.-P. Chan, A. Chughtai, S. Patel, P. Agarwal, J. Kuriakose, L. Hadjiski, E. Kazerooni, Univ. of Michigan (United States)

Automated discovery of structural features of the optic nerve head on the basis of image and genetic data [9035-27]
M. Christopher, L. Tang, J. H. Fingert, T. E. Scheetz, The Univ. of Iowa (United States); M. D. Abramoff, The Univ. of Iowa (United States) and US Department of Veterans Affairs (United States)

Using undiagnosed data to enhance computerized breast cancer analysis with a three stage data labeling method [9035-28]
W. Sun, T.-L. Tseng, The Univ. of Texas at El Paso (United States); B. Zheng, Univ. of Oklahoma (United States); F. Lure, The Univ. of Texas at El Paso (United States); T. Wu, Arizona State Univ. (United States); G. Francia, S. Cabrera, J. Zhang, M. Vélez-Reyes, The Univ. of Texas at El Paso (United States); W. Qian, The Univ. of Texas at El Paso (United States) and Northeastern Univ. (China)

Fully automated segmentation of whole breast in MR images by use of dynamic programming [9035-31]
L. Jiang, Y. Lian, Shanghai Advanced Research Institute (China); Y. Gu, X. Hu, FuDan Univ. (China); Q. Li, Shanghai Advanced Research Institute (China)

Sparse representation of multi parametric DCE-MRI features using K-SVD for classifying gene expression based breast cancer recurrence risk [9035-32]
M. Mahrooghy, A. B. Ashraf, D. Daye, C. Mies, M. Rosen, M. Feldman, D. Kontos, Univ. of Pennsylvania (United States)

Digital breast tomosynthesis: effects of projection-view distribution on computer-aided detection of microcalcification clusters [9035-33]
R. K. Samala, H.-F. Chan, Y. Lu, L. Hadjiski, J. Wei, M. Helvie, Univ. of Michigan (United States)
Reducing false positives of small bowel segmentation on CT scans by localizing colon regions [9035-34]
W. Zhang, J. Liu, J. Yao, R. M. Summers, National Institutes of Health (United States)

An adaptive approach to centerline extraction for CT colonography using MAP-EM segmentation and distance field [9035-35]
H. Peng, Stony Brook Univ. (United States); L. C. Li, CUNY (United States); H. Wang, H. Han, Stony Brook Univ. (United States); P. J. Pickhardt, Univ. of Wisconsin School of Medicine and Public Health (United States); Z. Liang, Stony Brook Univ. (United States)

Improved parameter extraction and classification for dynamic contrast enhanced MRI of prostate [9035-36]
N. F. Haq, P. Kozlowski, E. C. Jones, S. D. Chang, S. L. Goldenberg, M. Moradi, The Univ. of British Columbia (Canada)

Distinguishing prostate cancer from benign confounders via a cascaded classifier on multi-parametric MRI [9035-37]
G. J. S. Litjens, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); R. Elliott, Case Western Reserve Univ. (United States); N. Shih, M. Feldman, Univ. of Pennsylvania (United States); J. O. Barentsz, C. A. Hulsbergen - van de Kaa, I. Kovacs, H. J. Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); A. Madabhushi, Case Western Reserve Univ. (United States)

A prostate MRI atlas of biochemical failures following cancer treatment [9035-38]
M. Rusu, Case Western Reserve Univ. (United States); J. Kurhanewicz, Univ. of California, San Francisco (United States); A. Tewari, Icahn School of Medicine at Mount Sinai Hospital (United States); A. Madabhushi, Case Western Reserve Univ. (United States)

Dynamic automated synovial imaging (DASI) for differential diagnosis of rheumatoid arthritis [9035-39]
E. Grisan, Univ. degli Studi di Padova (Italy); B. Raffeiner, Univ. degli Studi di Padova (Italy) and General Hospital Boziano (Italy); A. Coran, Giovanni XXIII Nursing Home (Italy); G. Rizzo, L. Cipriani, R. Shamare, Univ. degli Studi di Padova (Italy)

Automated identification of spinal cord and vertebas on sagittal MRI [9035-40]
C. Zhou, H.-P. Chan, Q. Dong, B. He, J. Wei, L. M. Hadjiiski, D. Couriel, Univ. of Michigan (United States)

Adaptive geodesic transform for segmentation of vertebrae on CT images [9035-41]
B. Gaonkar, Siemens Medical Solutions USA, Inc. (United States) and Univ. of Pennsylvania (United States); L. Shu, G. Hermosillo, Y. Zhan, Siemens Medical Solutions USA, Inc. (United States)
2D segmentation of intervertebral discs and its degree of degeneration from T2-weighted magnetic resonance images [9035-42]
I. Castro-Mateos, J. M. Pozo, The Univ. of Sheffield (United Kingdom); A. Lazary, National Ctr. for Spinal Disorders (Hungary); A. F. Frangi, The Univ. of Sheffield (United Kingdom)

Prediction of treatment response and metastatic disease in soft tissue sarcoma [9035-43]
H. Farhidzadeh, M. Zhou, D. B. Goldgof, L. O. Hall, Univ. of South Florida (United States); M. Raghavan, R. A. Gatenby, H. Lee Moffitt Cancer Ctr. & Research Institute (United States)

Automatic detection and segmentation of liver metastatic lesions on serial CT examinations [9035-44]
A. Ben Cohen, I. Diamant, Tel Aviv Univ. (Israel); E. Klang, M. Amitai, Sheba Medical Ctr. (Israel); H. Greenspan, Tel Aviv Univ. (Israel)

Identification of corresponding lesions in multiple mammographic views using star-shaped iso-contours [9035-45]
R. Wiemker, D. Kutra, H. Heese, T. Buelow, Philips Research Hamburg (Germany)

Boosting classification performance in computer aided diagnosis of breast masses in raw full-field digital mammography using processed and screen film images [9035-46]
T. Kooi, N. Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Lesion classification using clinical and visual data fusion by multiple kernel learning [9035-47]
P. Kisilev, IBM Research Haifa (Israel); S. Hashoul, IBM Research Haifa (Israel) and Carmel Medical Ctr. (Israel); E. Walach, A. Tzadok, IBM Research Haifa (Israel)

Breast density and parenchymal texture measures as potential risk factors for estrogen-receptor positive breast cancer [9035-48]
B. M. Keller, J. Chen, E. F. Conant, D. Kontos, Univ. of Pennsylvania (United States)

Ultrasound breast lesion segmentation using adaptive parameters [9035-49]
B. H. Cho, Y. K. Seong, J. Kim, Samsung Advanced Institute of Technology (Korea, Republic of); Z. Liu, Z. Hao, Samsung Advanced Institute of Technology (China); E. Y. Ko, Samsung Medical Ctr. (Korea, Republic of); K.-G. Woo, Samsung Advanced Institute of Technology (China)

Comparison of CLASS and ITK-SNAP in segmentation of urinary bladder in CT urography [9035-50]
K. Cha, L. Hadjiiski, H.-P. Chan, E. M. Caoili, R. H. Cohan, C. Zhou, Univ. of Michigan (United States)
Abdominal lymphadenopathy detection using random forest [9035-51]
K. M. Cherry, S. Wang, E. B. Turkbey, R. M. Summers, National Institutes of Health (United States)

A new classifier fusion method based on confusion matrix and classification confidence for recognizing common CT imaging signs of lung diseases [9035-52]
L. Ma, X. Liu, L. Song, Y. Liu, Beijing Institute of Technology (China); C. Zhou, X. Zhao, Y. Zhao, Chinese Academy of Medical Sciences (China)

Automated detection and quantification of micronodules in thoracic CT scans to identify subjects at risk for silicosis [9035-53]
C. Jacobs, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); S. H. T. Opdam, Technische Univ. Eindhoven (Netherlands); E. M. van Rikxoort, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); O. M. Mets, Univ. Medical Ctr. Utrecht (Netherlands); J. Rooyackers, Utrecht Univ. (Netherlands); P. A. de Jong, Univ. Medical Ctr. Utrecht (Netherlands); M. Prokop, B. van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Multiple-instance learning for computer-aided detection of tuberculosis [9035-54]
J. Melendez, C. I. Sánchez, R. H. H. M. Philipsen, P. Maduskar, B. van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Seamless insertion of real pulmonary nodules in chest CT exams [9035-55]
A. Pezeshk, B. Sahiner, R. Zeng, A. Wunderlich, W. Chen, N. Petrick, U.S. Food and Drug Administration (United States)

POSTER SESSION: BREAST

Classification based micro-calcification detection using discriminative restricted Boltzmann machine in digitized mammograms [9035-56]
S. Shin, Seoul National Univ. (Korea, Republic of); S. Lee, Samsung Electronics Co., Ltd. (Korea, Republic of); I. D. Yun, Hankuk Univ. of Foreign Studies (Korea, Republic of)

Automatic ultrasound image enhancement for 2D semi-automatic breast-lesion segmentation [9035-57]
K. Lu, C. S. Hall, Philips Research North America (United States)

A content based framework for mass retrieval in mammograms [9035-58]
S. Kaur, V. Sharma, S. Singh, S. Gupta, Panjab Univ. (India)

Development of a computer tool to detect and classify nodules in ultrasound breast images [9035-59]
K. D. Marcomini, A. A. O. Carneiro, H. Schiabel, Univ. de São Paulo (Brazil)

A new mass classification system derived from multiple features and a trained MLP model [9035-60]
M. Tan, The Univ. of Oklahoma (United States); J. Pu, Univ. of Pittsburgh (United States); B. Zheng, The Univ. of Oklahoma (United States)
Automated breast tissue density assessment using high order regional texture descriptors in mammography [9035-61]
Y. N. Law, A*STAR Bioinformatics Institute (Singapore); M. K. Lieng, Juniata College (United States); J. Li, Genome Institute of Singapore (Singapore); D. A.-A. Khoo, A*STAR Bioinformatics Institute (Singapore)

Improving breast mass detection using histogram of oriented gradients [9035-62]
V. Pomponiu, H. Hariharan, Univ. of Pittsburgh (United States); B. Zheng, The Univ. of Oklahoma (United States); D. Gur, Univ. of Pittsburgh (United States)

Part Two

Detection of the nipple in automated 3D breast ultrasound using coronal slab-average-projection and cumulative probability map [9035-63]
H. Kim, H. Hong, Seoul Women's Univ. (Korea, Republic of)

Bilateral image subtraction features for multivariate automated classification of breast cancer risk [9035-64]
J. M. Celaya-Padilla, J. Rodriguez-Rojas, J. I. Galván-Tejada, A. Martínez-Torteya, V. Treviño, J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

Roles of biologic breast tissue composition and quantitative image analysis of mammographic images in breast tumor characterization [9035-65]
K. Drukker, M. L. Giger, The Univ. of Chicago (United States); F. Duewer, S. Malkov, Univ. of California, San Francisco (United States); C. I. Flowers, Univ. of South Florida, Tampa (United States); B. Joe, K. Kerlikowske., Univ. of California, San Francisco (United States); J. S. Drukein, H. Lee Moffitt Cancer Ctr. & Research Institute (United States); J. Shepherd, Univ. of California, San Francisco (United States)

New method for predicting estrogen receptor status utilizing breast MRI texture kinetic analysis [9035-66]
B. Chaudhury, L. O. Hall, D. B. Goldgof, Univ. of South Florida (United States); R. A. Gatenby, R. Gillies, J. S. Drukein, H. Lee Moffitt Cancer Ctr. & Research Institute (United States)

Exploring perceptually similar cases with multi-dimensional scaling [9035-67]
J. Wang, Y. Yang, M. N. Wernick, R. M. Nishikawa, Illinois Institute of Technology (United States)

Application of computer-extracted breast tissue texture features in predicting false-positive recalls from screening mammography [9035-68]
S. Ray, J. Y. Choi, B. M. Keller, J. Chen, E. F. Conant, D. Kontos, Univ. of Pennsylvania (United States)

Chest-wall segmentation in automated 3D breast ultrasound images using thoracic volume classification [9035-69]
T. Tan, J. van Zelst, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); W. Zhang, QView Medical, Inc. (United States); R. M. Mann, B. Plateel, N. Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
**Classification of breast lesions presenting as mass and non-mass lesions** [9035-70]
C. Gallego-Ortiz, A. L. Martel, Univ. of Toronto (Canada) and Sunnybrook Research Institute (Canada)

**POSTER SESSION: HEAD, NECK, AND NOVEL**

9035 20  
**Computer-based assessment of left ventricular regional ejection fraction in patients after myocardial infarction** [9035-23]  
S.-K. Teo, Y. Su, A*STAR Institute of High Performance Computing (Singapore); R. C. Tan, L. Zhong, National Heart Ctr. Singapore (Singapore) and Duke-NUS Graduate Medical School (Singapore)

9035 21  
**Toward early diagnosis of arteriosclerotic diseases: collaborative detection of carotid artery calcsifications by computer and dentists on dental panoramic radiographs** [9035-73]  
C. Muramatsu, R. Takahashi, T. Hara, Gifu Univ. (Japan); T. Hayashi, Media Co., Ltd. (Japan); A. Katsumata, Asahi Univ. (Japan); X. Zhou, H. Fujita, Gifu Univ. (Japan)

9035 22  
**Automatic classification of schizophrenia using resting-state functional language network via an adaptive learning algorithm** [9035-74]  
M. Zhu, N. Jie, Institute of Automation (China); T. Jiang, Institute of Automation (China) and Univ. of Electronic Science and Technology of China (China)

9035 23  
**Accurate discrimination of Alzheimer’s disease from other dementia and/or normal subjects using SPECT specific volume analysis** [9035-75]  
H. Iyatomi, Hosei Univ. (Japan); J. Hashimoto, F. Yoshii, T. Kazama, S. Kawada, Y. Imai, Tokai Univ. School of Medicine (Japan)

9035 24  
**Automatic pathology classification using a single feature machine learning support-vector machines** [9035-76]  
F. Yepes-Calderon, Children's Hospital Los Angeles (United States) and Univ. de Barcelona (Spain); F. Pedregosa, B. Thirion, INRIA Saclay - Île-de-France (France); Y. Wang, Arizona State Univ. (United States); N. Leporé, Univ. of Southern California (United States) and Children's Hospital Los Angeles (United States)

9035 26  
**MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression**  
First Place RFW All Conference Best Student Paper Award [9035-78]  
A. Martínez-Torteya, J. A. Rodríguez-Rojas, J. M. Celaya-Padilla, J. I. Galván-Tejada, V. Treviño, J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

9035 27  
**Volume curtaining: a focus+context effect for multimodal volume visualization** [9035-80]  
A. J. Fairfield, J. Plasencia, Arizona State Univ. (United States); Y. Jang, Sejong Univ. (Korea, Republic of); N. Theodore, N. R. Crawford, Barrow Neurosurgical Ctr. (United States); D. H. Frakes, R. Maciejewski, Arizona State Univ. (United States)

9035 28  
**Multilevel image recognition using discriminative patches and kernel covariance descriptor** [9035-81]  
L. Lu, J. Yao, E. Turkbey, R. M. Summers, National Institutes of Health (United States)
9035 29  **Surgical retained foreign object (RFO) prevention by computer aided detection (CAD)** [9035-82]
T. C. Marentis, L. Hadjiyski, A. R. Chaudhury, L. Rondon, N. Chronis, H.-P. Chan, Univ. of Michigan (United States)

9035 2A  **Quantitative characterization of brain β-amyloid using a joint PiB/FDG PET image histogram** [9035-83]
J. J. Camp, D. P. Hanson, D. R. Holmes III, B. J. Kemp, M. L. Senjem, M. E. Murray, D. W. Dickson, J. E. Parisi, R. C. Petersen, V. J. Lowe, R. A. Robb, Mayo Clinic (United States)

9035 2B  **Texture descriptors to distinguish radiation necrosis from recurrent brain tumors on multi-parametric MRI** [9035-84]
P. Tiwari, P. Prasanna, Case Western Reserve Univ. (United States); L. Rogers, L. Wolansky, C. Badve, A. Sloan, M. Cohen, Univ. Hospitals (United States); A. Madabhushi, Case Western Reserve Univ. (United States)

**POSTER SESSION: LUNG, CHEST, AND ABDOMEN**

9035 2C  **Efficient 3D texture feature extraction from CT images for computer-aided diagnosis of pulmonary nodules** [9035-85]
F. Han, Stony Brook Univ. (China) and Northeastern Univ. (China); H. Wang, B. Song, Stony Brook Univ. (United States); G. Zhang, H. Lu, Fourth Military Medical Univ. (China); W. Moore, Z. Liang, Stony Brook Univ. (United States); H. Zhao, Northeastern Univ. (China)

9035 2D  **A novel computer-aided detection system for pulmonary nodule identification in CT images** [9035-86]
H. Han, Stony Brook Univ. (United States); L. Li, College of Staten Island (United States); H. Wang, H. Zhang, W. Moore, Z. Liang, Stony Brook Univ. (United States)

9035 2E  **Comparison of biophysical factors influencing on emphysema quantification with low-dose CT** [9035-87]
C. H. Heo, Seoul National Univ. (Korea, Republic of); J. H. Kim, Seoul National Univ. (Korea, Republic of) and Seoul National Univ. Hospital (Korea, Republic of)

9035 2F  **Microstructure analysis of the secondary pulmonary lobules by 3D synchrotron radiation CT** [9035-88]
Y. Fukuoka, Y. Kawata, N. Niki, Univ. of Tokushima (Japan); K. Umetani, Japan Synchrotron Radiation Research Institute (Japan); Y. Nakano, Shiga Univ. of Medical Science (Japan); H. Ohmatsu, National Cancer Ctr. Hospital East (Japan); N. Moriyama, Tokyo Midtown Medical Ctr. (Japan); H. Itoh, Univ. of Fukui (Japan)

9035 2G  **Wavelet based rotation invariant texture feature for lung tissue classification and retrieval** [9035-89]
J. K. Dash, S. Mukhopadhyay, R. Das Gupta, Indian Institute of Technology Kharagpur (India); M. K. Garg, N. Prabhakar, N. Khandelwal, Postgraduate Institute of Medical Education & Research (India)

9035 2H  **Effect of image variation on computer-aided detection systems** [9035-90]
S. P. Rabbani, KTH Royal Institute of Technology (Sweden); P. Maduskar, R. H. H. M. Philipsen, L. Hogeweg, B. van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
<table>
<thead>
<tr>
<th>Paper ID</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9035 2I</td>
<td>3D mapping of airway wall thickening in asthma with MSCT: a level set approach</td>
<td>C. Fetita, Télécom SudParis, Institut Mines-Telecom (France) and MAP5, CNRS (France); P. Brillet, Univ. Paris 13 (France); R. Hartley, Glenfield Hospital, Univ. of Leicester (United Kingdom); P. A. Grenier, Univ. Pierre et Marie Curie (France); C. Brightling, Glenfield Hospital, Univ. of Leicester (United Kingdom)</td>
</tr>
<tr>
<td>9035 2J</td>
<td>3D intrathoracic region definition and its application to PET-CT analysis</td>
<td>R. Cheirsilp, R. Bascom, T. W. Allen, W. E. Higgins, The Pennsylvania State Univ. (United States)</td>
</tr>
<tr>
<td>9035 2K</td>
<td>Lung texture classification using bag of visual words</td>
<td>M. Asherov, I. Diamant, H. Greenspan, Tel-Aviv Univ. (Israel)</td>
</tr>
<tr>
<td>9035 2L</td>
<td>Automated segmentation of murine lung tumors in x-ray micro-CT images</td>
<td>J. K. Y. Swee, Imperial College London (United Kingdom); C. Sheridan, E. de Bruijn, J. Downward, F. Lassailly, Cancer Research UK (United Kingdom); L. Pizarro, Univ. College London (United Kingdom)</td>
</tr>
<tr>
<td>9035 2M</td>
<td>Longitudinal follow-up study of smoking-induced emphysema progression in low-dose CT screening of lung cancer</td>
<td>H. Suzuki, M. Matsuhiro, Y. Kawata, N. Niki, Univ. of Tokushima (Japan); Y. Nakano, Shiga Univ. of Medical Science (Japan); H. Ohmatsu, National Cancer Ctr. Hospital East (Japan); M. Kusumoto, T. Tsuchida, National Cancer Ctr. Hospital (Japan); K. Eguchi, Teikyo Univ. School of Medicine (Japan); K. Kaneko, Tokyo Health Service Association (Japan); N. Moriyama, Tokyo Midtown Medical Ctr. (Japan)</td>
</tr>
<tr>
<td>9035 2N</td>
<td>Potential usefulness of a topic model-based categorization of lung cancers as quantitative CT biomarkers for predicting the recurrence risk after curative resection</td>
<td>Y. Kawata, N. Niki, Univ. of Tokushima (Japan); H. Ohmatsu, K. Aokage, National Cancer Ctr. Hospital East (Japan); M. Kusumoto, T. Tsuchida, National Cancer Ctr. Hospital (Japan); M. Satake, National Cancer Ctr. Hospital East (Japan); K. Eguchi, Teikyo Univ. School of Medicine (Japan); M. Kaneko, Tokyo Health Service Association (Japan); N. Moriyama, Tokyo Midtown Medical Ctr. (Japan)</td>
</tr>
<tr>
<td>9035 2O</td>
<td>Computerized organ localization in abdominal CT volume with context-driven generalized Hough transform</td>
<td>J. Liu, Q. Li, Shanghai Advanced Research Institute (China)</td>
</tr>
<tr>
<td>9035 2P</td>
<td>Segmentation of urinary bladder in CT urography (CTU) using CLASS with enhanced contour conjoint procedure</td>
<td>K. Cha, L. Hadjiiski, H.-P. Chan, R. H. Cohan, E. M. Caoili, C. Zhou, Univ. of Michigan (United States)</td>
</tr>
<tr>
<td>9035 2Q</td>
<td>Level-set based free fluid segmentation with improved initialization using region growing in 3D ultrasound sonography</td>
<td>D. H. Kim, KAIST (Korea, Republic of); K. N. Plataniotis, Univ. of Toronto (Canada); Y. M. Ro, KAIST (Korea, Republic of)</td>
</tr>
</tbody>
</table>
Performance of an automated renal segmentation algorithm based on morphological erosion and connectivity [9035-100]
B. Abiri, B. Park, H. Chandarana, A. Mikheev, New York Univ. School of Medicine (United States); V. S. Lee, Univ. of Utah Health Systems (United States); H. Rusinek, New York Univ. School of Medicine (United States)

COMPASS-based ureter segmentation in CT urography (CTU) [9035-101]
D. Zick, L. Hadjiyiyski, H.-P. Chan, R. H. Cohan, E. M. Caoli, C. Zhou, J. Wei, Univ. of Michigan (United States)

Ultrasound based computer-aided-diagnosis of kidneys for pediatric hydronephrosis [9035-102]
J. J. Cerrolaza, C. A. Peters, A. D. Martin, E. Myers, Children's National Medical Ctr. (United States); N. Safdar, M. G. Linguraru, Children's National Medical Ctr. (United States) and George Washington Univ. (United States)

Automated abdominal lymph node segmentation based on RST analysis and SVM [9035-103]
Y. Nimura, Y. Hayashi, Nagoya Univ. (Japan); T. Kitasaka, Aichi Institute of Technology (Japan); K. Furukawa, Nagoya Univ. (Japan); K. Misawa, Aichi Cancer Ctr. Hospital (Japan); K. Mori, Nagoya Univ. (Japan)

A universal approach for automatic organ segmentations on 3D CT images based on organ localization and 3D GrabCut [9035-104]
X. Zhou, T. Ito, Gifu Univ. (Japan); X. Zhou, Nagoya Bunri Univ. (Japan); H. Chen, T. Hara, R. Yokoyama, Gifu Univ. (Japan); M. Kanematsu, Gifu Univ. Hospital (Japan); H. Hoshi, H. Fujita, Gifu Univ. (Japan)

POSTER SESSION: PROSTATE AND COLON

A novel colonic polyp volume segmentation method for computer tomographic colonography [9035-105]
H. Wang, Stony Brook Univ. (United States) and Beihang Univ. (United States); L. C. Li, College of Staten Island (United States); H. Han, B. Song, H. Peng, Stony Brook Univ. (United States); Y. Wang, L. Wang, BeiHang Univ. (China); Z. Liang, Stony Brook Univ. (United States)

Progressive region-based colon extraction for computer-aided detection and quantitative imaging in cathartic and non-cathartic CT colonography [9035-106]
J. J. Näppi, Y. Ryu, H. Yoshida, Massachusetts General Hospital (United States) and Harvard Medical School (United States)

GISentinel: a software platform for automatic ulcer detection on capsule endoscopy videos [9035-107]
S. Yi, H. Jiao, F. Meng, Xyken, LLC (United States); J. A. Leighton, P. Shabana, L. Rentz, Mayo Clinic (United States)
9035 22  Retinal image quality assessment using generic features [9035-108]
M. Fasih, J. M. P. Langlois, Ecole Polytechnique de Montréal (Canada); H. Ben Tahar, DIAGNOS Inc. (Canada); F. Cheriet, Ecole Polytechnique de Montréal (Canada)

9035 30  A boosted optimal linear learner for retinal vessel segmentation [9035-110]
E. Poletti, E. Grisan, Univ. degli Studi di Padova (Italy)

9035 31  Glaucoma detection based on local binary patterns in fundus photographs [9035-111]
M. Alsheh Ali, T. Hurtut, Univ. Paris Descartes (France) and École Polytechnique de Montréal (Canada); T. Faucon, DIAGNOS inc. (Canada); F. Cheriet, Ecole Polytechnique de Montréal (Canada)

9035 32  Automatic multiresolution age-related macular degeneration detection from fundus images [9035-112]
M. Garnier, T. Hurtut, Univ. Paris Descartes (France) and École Polytechnique de Montréal (Canada); H. Ben Tahar, DIAGNOS inc. (Canada); F. Cheriet, Ecole Polytechnique de Montréal (Canada)

9035 33  Preliminary study on differentiation between glaucomatous and non-glaucomatous eyes on stereo fundus images using cup gradient models [9035-114]
C. Muramatsu, Gifu Univ. (Japan); Y. Hatanaka, Univ. of Shiga Prefecture (Japan); K. Ishida, A. Sawada, T. Yamamoto, H. Fujita, Gifu Univ. (Japan)

9035 35  From medical imaging to computer simulation of fractional flow reserve in four coronary artery trees [9035-116]
S. Melchionna, S. Fortini, CNR, Istituto per i Processi Chimico-Fisici (Italy); M. Bernaschi, M. Bisson, CNR, Istituto per le Applicazioni del Calcolo (Italy); N. Kang, H.-E. Lee, Samsung Advanced Institute of Technology (Korea, Republic of)

9035 36  Learning-based automatic detection of severe coronary stenoses in CT angiographies [9035-117]
I. Melki, Univ. Paris-Est Marne-la-Vallée (France) and GE Healthcare (France); C. Cardon, N. Gogin, GE Healthcare (France); H. Talbot, L. Najman, Univ. Paris-Est Marne-la-Vallée (France)

9035 37  Time-resolved volumetric MRI blood flow: a Doppler ultrasound perspective [9035-118]
R. van Pelt, Technische Univ. Eindhoven (Netherlands); J. Oliván Bescós, Philips Healthcare (Netherlands); E. Nagel, King’s College London (United Kingdom); A. Vianova, Technische Univ. Eindhoven (Netherlands)

POSTER SESSION: MUSCULOSKELETAL AND MISCELLANEOUS

9035 38  Description of patellar movement by 3D parameters obtained from dynamic CT acquisition [9035-120]
M. de Sá Rebelo, R. A. Moreno, R. G. Gobbi, G. L. Camanho, L. F. R. de Ávila, M. K. Demange, J. R. Pecora, M. A. Gutierrez, Univ. de São Paulo (Brazil)
Wide association study of radiological features that predict future knee OA pain: data from the OAI [9035-121]
J. I. Galván-Tejada, J. M. Celaya-Padilla, A. Martínez-Torteya, J. Rodriguez-Rojas, V. Treviño, J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

Vertebral degenerative disc disease severity evaluation using random forest classification [9035-122]
H. E. Muñoz, J. Yao, National Institutes of Health (United States); J. E. Burns, Y. Pham, Univ. of California, Irvine (United States); J. Stieger, R. M. Summers, National Institutes of Health (United States)

Registration and color calibration for dermoscopy images in time-course analysis [9035-123]
D. Furusho, H. Iyatomi, Hosei Univ. (Japan)

Towards quantitative assessment of calciphylaxis [9035-124]
T. M. Deserno, I. Sárándi, A. Jose, D. Haak, S. Jonas, P. Specht, V. Brandenburg, RWTH Aachen (Germany)

Towards robust identification and tracking of nevi in sparse photographic time series [9035-125]
J. Vogel, A. Duliu, Technische Univ. München (Germany); Y. Oyamada, Technische Univ. München (Japan) and Waseda Univ. (Japan); J. Gardiazabal, Technische Univ. München (Germany); T. Lasser, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); M. Ziai, R. Hein, N. Navab, Technische Univ. München (Germany)

Evaluation of a computer-aided skin cancer diagnosis system for conventional digital photography with manual segmentation [9035-126]
A. Huang, National Central Univ. (Taiwan); W.-Y. Chang, Kaohsiung Medical Univ. (Taiwan) and E-Da Hospital, I-Shou Univ. (Taiwan); C.-H. Hsieh, H.-I. Liu, National Central Univ. (Taiwan); G. S. Chen, Kaohsiung Medical Univ. (Taiwan)

Computer aided diagnosis of diabetic peripheral neuropathy [9035-127]
V. Chekh, Univ. of New Mexico (United States); P. Soliz, E. McGrew, S. Barriga, VisionQuest Biomedical, LLC (United States); M. Burge, S. Luan, Univ. of New Mexico (United States)

An automatic early stage alveolar-bone-resorption evaluation method on digital dental panoramic radiographs [9035-128]
M. Zhang, Gifu Univ. (Japan); A. Katsumata, Asahi Univ. (Japan); C. Muramatsu, T. Harra, Gifu Univ. (Japan); H. Suzuki, Asahi Univ. (Japan); H. Fujita, Gifu Univ. (Japan)

A method for automatic liver segmentation from multi-phase contrast-enhanced CT images [9035-129]
R. Yuan, M. Luo, S. Wang, Huazhong Univ. of Science and Technology (China); L. Wang, Huazhong Univ. of Science and Technology (China) and Raycan Technology Co., Ltd. (China); Q. Xie, Huazhong Univ. of Science and Technology (China)

Classification of weak specular reflections in laparoscopic images [9035-130]
B. Chakraborty, J. M. Marcinczak, R.-R. Grigat, Technische Univ. Hamburg-Harburg (Germany)
Active shape models incorporating isolated landmarks for medical image annotation
(9035-131)
T. Norajitra, H.-P. Meinzer, B. Stieltjes, K. H. Maier-Hein, Deutsches Krebsforschungszentrum
(Germany)

Texture feature based liver lesion classification (9035-132)
Y. Doron, N. Mayer-Wolf, I. Diamant, H. Greenspan, Tel-Aviv Univ. (Israel)

Automatic seed selection for segmentation of liver cirrhosis in laparoscopic sequences
(9035-133)
R. Sinha, J. M. Marcinczak, R.-R. Grigat, Technische Univ. Hamburg-Harburg (Germany)

Infective endocarditis detection through SPECT/CT images digital processing (9035-134)
A. Moreno, R. Valdés, L. Jiménez, Univ. Autónoma Metropolitana (Mexico); E. Vallejo, ABC
Medical Ctr. Santa Fe (Mexico); S. Hernández, G. Soto, Instituto Nacional de Cardiología -
Ignacio Chávez (Mexico)

A preliminary study for fully automated quantification of psoriasis severity using image
mapping (9035-136)
K. Mukai, H. Iyatomi, Hosei Univ. (Japan)

Author Index
Conference Committee

Symposium Chairs

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

Conference Chairs

Stephen Aylward, Kitware, Inc. (United States)
Lubomir M. Hadjiiski, University of Michigan Health System
(United States)

Conference Program Committee

Samuel G. Armato III, The University of Chicago (United States)
Susan M. Astley, The University of Manchester (United Kingdom)
Kyongtae Ty Bae, University of Pittsburgh Medical Center
(United States)
Matthew S. Brown, University of California, Los Angeles (United States)
Heang-Ping Chan, University of Michigan Health System
(United States)
Marleen de Bruijne, Erasmus MC (Netherlands) and University of
Copenhagen (Denmark)
Thomas M. Deserno, RWTH Aachen (Germany)
Catalin Fetita, Telecom SudParis (France)
Hiroshi Fujita, Gifu University School of Medicine (Japan)
Maryellen L. Giger, The University of Chicago (United States)
Hayil Greenspan, Tel Aviv University (Israel)
Horst K. Hahn, Fraunhofer MEVIS (Germany) and Jacobs University
Bremen (Germany)
Khan M. Iftekharuddin, Old Dominion University (United States)
Nico Karssemeijer, Radboud University Nijmegen Medical Center
(Netherlands)
Jong Hyo Kim, Seoul National University College of Medicine
(Korea, Republic of)
Marius George Linguraru, Children’s National Medical Center
Joseph Y. Lo, Duke University (United States)
(United States) and George Washington University (United States)
Michael F. McNitt-Gray, University of California, Los Angeles
(United States)
Kensaku Mori, Nagoya University (Japan)
Janne J. Näppi, Massachusetts General Hospital (United States) and
Harvard Medical School (United States)
Meindert Niemeijer, IDx, LLC. (United States)
Noboru Niki, University of Tokushima (Japan)
Carol L. Novak, Siemens Corporation, Corporate Technology
   (United States)
Nicholas A. Petrick, U.S. Food and Drug Administration (United States)
Clarisa Sánchez, Radboud University Nijmegen Medical Center
   (Netherlands)
Ronald M. Summers, National Institutes of Health (United States)
Kenji Suzuki, The University of Chicago (United States)
Georgia D. Tourassi, Oak Ridge National Laboratory (United States)
Bram van Ginneken, Radboud University Nijmegen Medical Center
   (Netherlands)
Eva M. van Rikxoort, Radboud University Nijmegen Medical Center
   (Netherlands)
Rafael Wiemker, Philips Research (Germany)
Axel Wismüller, University of Rochester Medical Center (United States)
Xiaofeng Yang, Emory University (United States)

Session Chairs

Head, Neck, and Novel Methods
Marius George Linguraru, Children’s National Medical Center
   (United States)
Eva M. van Rikxoort, Radboud University Nijmegen Medical Center
   (Netherlands)

Prostate and Colon I
Janne J. Näppi, Massachusetts General Hospital (United States) and
   Harvard Medical School (United States)
Maryellen L. Giger, The University of Chicago (United States)

Vessels, Heart, and Eye I
Bram van Ginneken, Radboud University Nijmegen Medical Center
   (Netherlands)
Thomas M. Deserno, RWTH Aachen (Germany)

Keynote: Joint Session with Conferences 9035 and 9039
Heinz U. Lemke, Computer Assisted Radiology and Surgery
   (Germany)

Lung, Chest, and Abdomen I
Nicholas A. Petrick, U.S. Food and Drug Administration (United States)
Jong Hyo Kim, Seoul National University College of Medicine
   (Korea, Republic of)
Vessels, Heart, and Eye II
Marleen de Bruijne, Erasmus MC (Netherlands) and University of Copenhagen (Denmark)
Clarisa I. Sánchez, Radboud University Nijmegen Medical Center (Netherlands)

Breast I
Joseph Y. Lo, Duke University Medical Center (United States)
Georgia D. Tourassi, Oak Ridge National Laboratory (United States)

Prostate and Colon II
Ronald M. Summers, National Institutes of Health (United States)

Musculoskeletal and Miscellaneous
Axel Wismüller, University of Rochester Medical Center (United States)
Michael F. McNitt-Gray, University of California, Los Angeles (United States)

Breast II
Horst Karl Hahn, Fraunhofer MEVIS (Germany)
Hiroshi Fujita, Gifu University School of Medicine (Japan)

Lung, Chest, and Abdomen II
Kyongtae Ty Bae, University of Pittsburgh Medical Center (United States)
Rafael Wiemker, Philips Research (Germany)
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

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. Viswnath, Case Western Reserve Univ. (United States); J. Futterer, J. Bomers, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); A. Madabhushi, Case Western Reserve Univ. (United States)