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Conferences & Courses
27 February–3 March 2016

Town & Country Resort and Convention Center
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DATES
Conferences and Courses
27 February–3 March 2016

LOCATION
Town & Country Resort and Convention Center
San Diego, California, USA

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SPIE would like to express its deepest appreciation to the symposium chairs, conference chairs, program committees, session chairs, and authors who have so generously given their time and advice to make this symposium possible.

The symposium, like our other conferences and activities, would not be possible without the dedicated contribution of our participants and members. This program is based on commitments received up to the time of publication and is subject to change without notice.

Contents

TECHNICAL CONFERENCES

DAILY EVENT SCHEDULE

SATURDAY 27 February	SUNDAY 28 February	MONDAY 29 February	TUESDAY 1 March	WEDNESDAY 2 March	THURSDAY 3 March
SC086 **Fundamentals of Medical Image Processing and Analysis** (Deserno) 8:30 am to 5:30 pm, $570 / $660	**CONFERENCE 9783: Physics of Medical Imaging**, p. 26 Chairs: **Despina Kontos,** The Univ. of Pennsylvania Health System (USA) and **Thomas G. Flohr,** Siemens Healthcare GmbH (Germany)				
SC1182 **ITK in Biomedical Research and Commercial Applications** (McCormick, Aylward, Johnson, Lowekamp) 8:30 am to 5:30 pm, $570 / $660			**CONFERENCE 9784: Image Processing**, p. 26 Chairs: **Martin A. Styner,** The Univ. of North Carolina at Chapel Hill (USA) and **Elsa D. Angelini,** Columbia Univ. (USA), Télécom ParisTech (France)		
SC1183 **Modern Diagnostic X-Ray Sources** (Behling) 8:30 am to 12:30 pm, $490 / $540	**CONFERENCE 9785: Computer-Aided Diagnosis**, p. 20 Chairs: **Georgia D. Tourassi,** Oak Ridge National Lab. (USA) and **Samuel G. Armato III**, The Univ. of Chicago (USA)				**Student Paper Awards 2016, p. 9**
SC1127 **ROC Analysis and Observer Studies to Evaluate Imaging Technology** (Hillis, Nishikawa, Samuelson) 8:30 am to 5:30 pm, $570 / $660	**CONFERENCE 9786: Image-Guided Procedures, Robotic Interventions, and Modeling**, p. 26 Chairs: **Robert J. Webster III,** Vanderbilt Univ. (USA) and **Ziv R. Yaniv,** National Library of Medicine (USA)			**CONFERENCE 9787: Image Perception, Observer Performance, and Technology Assessment**, p. 26 Chairs: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA) and **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (USA)	
SC829 **MIC-GPU: High-Performance Computing for Medical Imaging on Programmable Graphics Hardware (GPU)** (Mueller, Ha) 1:30 pm to 5:30 pm, $360 / $410	**CONFERENCE 9789: PACS and Imaging Informatics: Next Generation and Innovations**, p. 27 Chairs: **Jianguo Zhang,** Shanghai Institute of Technical Physics (China) and **Tessa S. Cook,** The Univ. of Pennsylvania Health System (USA)		**CONFERENCE 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging**, p. 27 Chairs: **Barjor Gimi,** Geisel School of Medicine at Dartmouth (USA) and **Andrzej Krol,** SUNY Upstate Medical Univ. (USA)		
WS776 **Writing for Publication in Medical Imaging** (Hanson) 1:30 pm to 5:30 pm, $125 / $175	**CONFERENCE 9790: Ultrasonic Imaging and Tomography**, p. 27 Chairs: **Neb Duric,** Delphinus Medical Technologies (USA), Barbara Ann Karmanos Cancer Institute (USA) and **Brecht Heyde,** Katholieke Univ. Leuven (Belgium), Duke Univ. (USA)		9784 Keynote Presentation: **Image Processing Pipelines: Applications in Magnetic Resonance Histology** (Johnson) 10:10 to 11:10 am, p.12 **Women's Networking Lunch**, 12:10 to 1:20 pm, p.22	**CONFERENCE 9791: Digital Pathology**, p. 27 Chairs: **Metin N. Gurcan,** The Ohio State Univ. Wexner Medical Ctr. (USA) and **Anant Madabhushi,** Case Western Reserve Univ. (USA)	
	SC987 **Spectral CT Imaging** (Schmidt, Flohr, Grant) 8:30 am to 12:30 pm, $360 / $410	9785 Keynote Presentation: **Radiomics: There is More Than Meets the Eye in Medical Imaging** (Aerts) 8:00 to 9:00 am, p.11	9786 Keynote Presentation: **Robot-Assisted Tumor Resection: Palpation, Incision, Debridement, and Adhesive Closure** (Goldberg) 1:20 to 2:20 pm, p.11	9788 Keynote Presentation: **Interesting *In- Vivo* Magnetic Resonance Experiments that are Not Quite Ready for Prime Time and Some that Are!** (Ackerman) 10:10 to 11:10 am, p.12	9787 Keynote Presentation: **Image Perception Foundation of Success for NLST** (Jacobson) 8:00 to 9:00 am, p.13
	SC1129 **Photon Counting X-ray Imaging: Technology and Methods** (Danielsson) 1:30 pm to 5:30 pm, $360 / $410	SC1026 **Graph Algorithmic Techniques for Biomedical Image Segmentation** (Garvin, Wu) 8:30 am to 12:30 pm, $360 / $410	SC1185 **Radiation Dosimetry in Diagnostic Radiology: A Primer** (Maidment) 1:30 pm to 5:30 pm, $360 / $410	9791 Keynote Presentation: **Current Challenges in Digital Pathology** (Bloom) 1:20 to 2:20 pm, p.12	9791 Invited Paper: **Cancer diagnostics in Africa: leapfrog technology and volunteers transform care** (Holladay) 2:40 to 3:10 pm, p.62
	9789 Keynote Presentation: **Connecting Images to the Electronic Medical Record: Structured Reporting, Machine Learning, and Natural Language Processing** (Langlotz) 8:40 to 9:40 am p.10	SC1184 **Methodology for Measuring Functional Connectivity in Neuroimaging Data Analysis** (Lei) 8:30 am to 12:30 pm, $360 / $410	WS757 **Early Career Professional Development in Medical Imaging** (Krupinski) 1:30 pm to 5:30 pm, $125 / $175		
	Lunch with the Experts - A Student Networking Event, 12:10 to 1:20 pm, p.22	9790 Keynote Presentation: **Enhanced Ultrasound, Ultrasound Tomography for Volume Limb Imaging and Prosthetic Fitting** (Anthony) 10:10 to 11:10 am, p.11	SPIE-AAPM-NCI PANEL DISCUSSION: **CAD Grand Challenges: Paving the Way for Imaging in the Era of Precision Medicine** (Armato) 3:30 to 4:50 pm, p.15		
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			TECHNICAL WORKSHOP WK3: **Live Demonstrations** (Chan, Hahn) 5:00 to 7:00 pm, p.15		
			TECHNICAL WORKSHOP WK5: **Validation of Medical Image-Perception Models** (Abbey, Kupinski) 5:00 to 7:00 pm, p.15		
			TECHNICAL WORKSHOP WK6: **NIH Funding Opportunities: Navigating the System and Tips for Applicants** (Sastre) 5:00 to 7:00 pm, p.15		

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TECHNICAL WORKSHOP WK4: **Sensing Challenges and Prospects in Miniaturizing Surgical Robots and Tools** (Burgner-Kahrs) 5:45 to 7:45 pm, p.14

SPIE/IFCARS JOINT WORKSHOP WK7: **Information Management, Systems Integration, Standards, and Approval Issues for the Digital Operating Room** (Berliner, Lemke) 5:45 to 7:45 pm, p.14

SPIE STUDENT MEMBERS receive 50% OFF all courses and workshops.

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9783	Conference 9784	Conference 9785	Conference 9786	Conference 9787	Conference 9788	Conference 9789	Conference 9790	Conference 9791
SUNDAY · 28 February									
8:00 to 9:40 am	**SESSION 1:** **Tomosynthesis and Digital Subtraction Angiography** *(Joseph Y. Lo, John M. Sabol)*		**SESSION 1:** **Vessels and Heart** *(Stephen Aylward, Thomas Deserno)*	**SESSION 1:** **Cardiac Procedures** *(Maryam E. Rettmann, David R. Holmes III)*			**Session 1A:** **Keynote**, 8:40 am *(Jianguo Zhang)*	**SESSION 1:** **Motion and Deformation Imaging** *(Brett C. Byram)*	
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	**SESSION 2:** **Breast Imaging** *(Andreu Badal, Wei Zhao)*		**SESSION 2:** **Musculoskeletal and Miscellaneous** *(Axel Wismülle Carol L. Novak)*	**SESSION 2:** **Segmentation and 2D and 3D Registration** *(David R. Haynor, Baowei Fei)*			**SESSION 1:** **Imaging Informatics for Precision Medicine** *(Wyatt Tellis)*	**SESSION 2:** **Ultrasound Tomography and Reconstruction** *(Olivier Roy, Torsten Hopp)*	
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm	**SESSION 3:** **Keynote and Dual and Multi Energy CT** *(Despina Kontos, Thomas G. Flohr)*		**SESSION 3:** **Lung and Chest I** *(Matthew S. Brown, Catalin Fetita)*	**SESSION 3:** **Spine and Percutaneous Procedures** *(Gabor Fichtinger, David J. Hawkes)*			**SESSION 2:** **Surgical PACS, 3D Printing, and Imaging Informatics for Non-radiological Applications** *(Thomas Deserno)*	**SESSION 3:** **Ultrasound Image Analysis and Tissue Characterization** *(Brecht Heyde)*	
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm	**SESSION 4:** **Cone Beam CT I: New Technologies, Corrections** *(John Yorkston, Hilde Bosmans)*		**SESSION 4:** **Breast** *(Hiroshi Fujita, Karen Drukker)*	**SESSION 4:** **Ultrasound Image Guidance:** Joint Session with Confs. 9786 and 9790 *(Parvin Mousavi, Brecht Heyde)*			**SESSION 3:** **Imaging Informatics for Diagnostics and Therapeutic Applications** *(Maria Y. Law)*	**SESSION 4:** **Ultrasound Image Guidance** Joint Session with Confs. 9786 and 9790 *(Parvin Mousavi, Brecht Heyde)*	
5:45 to 7:45 pm	TECHNICAL WORKSHOPS								
MONDAY · 29 February									
8:00 to 9:40 am	**SESSION 5:** **Phase Contrast Imaging** *(Mini Das, Guang-Hong Chen)*		**SESSION 5:** **Keynote and Deep Learning I** *(Lubomir M. Hadjiiski, Horst K. Hahn)*	**SESSION 5:** **Registration** *(Lena Maier-Hein, Stefanie Speidel)*			**SESSION 4:** **Big Data Technologies and Image Sharing in Medical Imaging and Informatics** *(Brent J. Liu)*	**SESSION 5:** **Novel Imaging Strategies and Signal Processing** *(Mohammad Mehrmohammadi)*	
9:40 to 10:10 am	**Coffee Break**						**POSTER AWARD ANNOUNCEMENTS**		
10:10 am to 12:10 pm	**SESSION 6:** **Cone Beam CT II: System Optimization, Image Reconstruction** *(Marc Kachelriess, Maria Drangova)*		**SESSION 6:** **Radiomics I** *(Maryellen L. Giger, Nicholas A. Petrick)*	**SESSION 6:** **Robotic Systems and Treatment Planning** *(David M. Kwartowitz, Cristian A. Linte)*			**SESSION 5:** **Cloud Computing and Collaborating for Medical Imaging Services and Applications** *(Peter R. Bak)*	**SESSION 6:** **Keynote and New Applications of Ultrasound in Medicine and Biology** *(Brian Anthony, Neb Duric)*	
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:40 pm	**SESSION 7:** **CT I: Technology, System Characterization, Applications** *(Christoph Hoeschen, Kirsten Boedeker)*		**SESSION 7:** **Deep Learning II** *(Ronald M. Summers, Hayit Greenspan)*	**SESSION 7:** **Tissue Deformation and Motion** *(Michael I. Miga, Pierre Jannin)*				**SESSION 7:** **Transducers and Beamforming** *(Jørgen Arendt Jensen, Marko Jakovljevic)*	
3:30 to 4:00 pm	**Coffee Break**							**POSTER AWARD ANNOUNCEMENTS**	
4:00 to 5:15 pm	**Best Student Paper Awards and Plenary Presentation**								
5:30 to 7:00 pm	SUNDAY/MONDAY POSTER SESSION								

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9783	Conference 9784	Conference 9785	Conference 9786	Conference 9787	Conference 9788	Conference 9789	Conference 9790	Conference 9791
TUESDAY · 1 March									
8:00 to 9:40 am	**SESSION 8: Detectors** *(John A. Rowlands, Karim S. Karim)*	**SESSION 1 Quantitative Image Analysis** *(Marius G. Linguraru, Tomaž Vrtovec)*	**SESSION 8: Lung and Chest II** *(Bram van Ginneken, Rafael Wiemker)*	**SESSION 8: Intraoperative Imaging and Visualization** *(George J. Grevera, Amber L. Simpson)*					
9:40 to 9:45 am	POSTER AWARD ANNOUNCEMENTS		POSTER AWARD ANNOUNCEMENTS	POSTER AWARD ANNOUNCEMENTS					
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	**SESSION 9: CT II: Image Reconstruction, Artifact Reduction** *(Joseph W. Stayman, Michael Grass)*	**SESSION 2: Keynote and Diffusion MRI** *(Bennett A. Landman)*	**SESSION 9: Head and Neck** *(Khan M. Iftekharuddin, Fabrice Meriaudeau)*	**SESSION 9: Endoscopy/ Laparoscopy** *(Eric J. Seibel, William E. Higgins)*					
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm	**SESSION 10: Photon Counting CT I: Instrumentation** *(Mats Danielsson, Stephen J. Glick)*	**SESSION 3: Computational Anatomy** *(Mads Nielsen)*	**SESSION 10: Radiomics II** *(Nico Karssemeijer, Heang-Ping Chan)*	**SESSION 10: Keynote and New Robotic Applications** *(Robert J. Webster III, Ziv Yaniv)*		**SESSION 1: Novel Imaging Methods** *(Andrzej Krol Robert C. Molthen)*			
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 4:50 pm	**SESSION 11: PET and MR** *(Jinyi Qi, Christoph Hoeschen)*	**SESSION 4: Segmentation: Brain** *(Miguel Angel González Ballester, Ivana Isgum)*	**SESSION 11:** PANEL DISCUSSION: **CAD Grand Challenges: Paving the Way for Imaging in the Era of Precision Medicine** *(Samuel G. Armato)*	**SESSION 11: Prostate Procedures** *(Purang Abolmaesumi, Frank Sauer)*		**SESSION 2: Innovations in Image Processing** *(Armando Manduca Robert C. Molthen)*			
5:00 to 7:00 pm	**TECHNICAL WORKSHOPS**								
WEDNESDAY · 2 March									
8:00 to 9:40 am	**SESSION 12: Photon Counting CT II: Spectral Imaging** *(Taly G. Gilat-Schmidt, Mats Danielsson)*	**SESSION 5: Image Enhancement**	**SESSION 12: Colon and Prostate** *(Janne J. Näppi, Kenji Suzuki)*		**SESSION 1: Technology Assessment in Breast Imaging** *(Robert M. Nishikawa)*	**SESSION 3: Bone and Skeletal Imaging, Biomechanics** *(Robert C. Molthen, Axel Wismüll*			
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	**SESSION 13: New Systems and Technologies** *(Rebecca Fahrig, Ingrid S. Reiser)*	**SESSION 6: Shape** *(Cristian Lorenz)*	**SESSION 13: Abdominal** *(Hiroyuki Yoshida, Kensaku Mori)*		**SESSION 2: Model Observers I** *(François O. Bochud)*	**SESSION 4: Keynote and Neurological Imaging** *(Axel Wismüller, Barjor Gimi)*			
12:10 to 1:20 pm	**Lunch Break**								

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9783	Conference 9784	Conference 9785	Conference 9786	Conference 9787	Conference 9788	Conference 9789	Conference 9790	Conference 9791
WEDNESDAY Afternoon · 2 March									
1:20 to 3:00 pm	**SESSION 14: Scatter and Diffraction Imaging** *(Mini Das, Guang-Hong Chen)*	**SESSION 7: Motion/Registration** *(Kensaku Mori)*			**SESSION 3: Perception Metrology** *(Frank W. Samuelson)*	**SESSION 5: fMRI** *(Axel Wismüller, Barjor Gimi)*			**SESSION 1: Keynote and Trends** *(Metin N. Gurcan, Anant Madabhushi)*
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm	**SESSION 15: Task Driven Imaging, Observers, Detectability, Phantom Studies** *(Hee-Joung Kim, Anders Tingberg)*	**SESSION 8: Machine Learning** *(Murray H. Loew)*			**SESSION 4: Perception** *(Claudia R. Mello-Thoms)*	**SESSION 6: Optical** *(Yu Chen, Baohong Yuan)*			**SESSION 2 : Precision Medicine and Grading** *(John E. Tomaszewski)*
5:30 to 7:00 pm	**TUESDAY/WEDNESDAY POSTER SESSION**								
THURSDAY · 3 March									
8:00 to 9:40 am		**SESSION 9: Model-based Image Analysis and Image Synthesis** *(Jerry L. Prince)*			**SESSION 5: Keynote and ROC Analysis** *(Craig K. Abbey, Matthew A. Kupinski)*	**SESSION 7: Fluids and Cardiovascular** *(Armando Manduca, Robert C. Molthen)*			**SESSION 3: Detection and Segmentation** *(Anne L. Martel)*
9:40 to 9:45 am		**POSTER AWARD ANNOUNCEMENTS**			**POSTER AWARD ANNOUNCEMENTS**				**POSTER AWARD ANNOUNCEMENTS**
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm		**SESSION 10: Segmentation** *(Aaron Fenster)*			**SESSION 6: Model Observers II: Search** *(Howard C. Gifford, Subok Park)*	**SESSION 8: Cancer Imaging** *(Barjor Gimi, Baohong Yuan)*			**SESSION 4: Machine Learning** *(Aaron D. Ward, Josien P. W. Pluim)*
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm		**SESSION 11: Classification/ Population** *(Baowei Fei)*			**SESSION 7: Breast Imaging II** *(Pontus A. Timberg)*	**SESSION 9: Lung** *(Robert C. Molthen)*			**SESSION 5: Emerging Technologies** *(Selim Aksoy, Scott Doyle)* 2:40 to 3:10 pm **SESSION 6: Emerging Global Opportunities** *(Metin N. Gurcan, Anant Madabhushi)*
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm		**SESSION 12: Registration** *(Stefan Klein)*			**SESSION 8: Technology Assessment** *(Maciej A. Mazurowski)*	**SESSION 10: Novel MR Techniques and Applications** *(Barjor Gimi, Axel Wismüller)*			
5:30 to 5:35 pm						**POSTER AWARD ANNOUNCEMENTS**			

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AWARDS AND PLENARY SESSION

Monday 29 February • 4:00 to 5:15 pm • Location: Town & Country

4:00 to 4:15 pm

Best Student Paper Awards Announcement

The first place winner and runner up of the Robert F. Wagner All-Conference Student Paper Award will be announced, and conference finalists will be recognized.

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In Memoriam

Dr. Lee Allen Rosen
April 15, 1947 - October 22, 2015

When you think of medical imaging research a lot of names come to mind, but when you think of those having the most impact in terms of being an advocate for funding in our field one name stands out: Lee Rosen. Dr. Lee Rosen was a Scientific Review Officer at the National Institutes of Health for 26 years and head of the BMIT study section, where the majority of our grants go for review. On October 22, 2015 Lee passed away after a short but valiant battle with acute myeloid leukemia.

He will be dearly missed by those who served on his study sections and by those whose careers have been impacted by his constant efforts to make the grant review process as effective, efficient, and fair as possible. Dr. Rosen went out of his way to recruit the best and most appropriate reviewers for his study sections, and also took the added time and energy to talk with applicants about their submissions. His dedication to helping young scientists understand the review process was exemplified by the number of grant workshops he arranged and hosted at numerous scientific meetings over the years. It is impossible to count the number of medical imaging investigators that have benefited from Lee's advocacy, support, wisdom, and above all, friendship. He will be dearly missed by all of us.

Presented by: **Jerry L. Prince,** Johns Hopkins Univ. (USA)

4:15 to 5:15 pm

The Evolution of Medical Imaging from Qualitative to Quantitative: Opportunities, Challenges, and Approaches

Edward F. Jackson
Professor and Chair
Director, Medical Physics Graduate Program
Department of Medical Physics
Univ. of Wisconsin-Madison School of Medicine and Public Health (USA)

ABSTRACT: Over the past decade, there has been an increasing focus on quantitative imaging biomarkers (QIBs), which are defined as "objectively measured characteristics derived from in vivo images as indicators of normal biological processes, pathogenic processes, or response to a therapeutic intervention"[1]. To evolve qualitative imaging assessments to the use of QIBs requires the development and standardization of data acquisition, data analysis, and data display techniques, as well as appropriate reporting structures. As such, successful implementation of QIB applications relies heavily on expertise from the fields of medical physics, radiology, statistics, and informatics as well as collaboration from vendors of imaging acquisition, analysis, and reporting systems. When successfully implemented, QIBs will provide image-derived metrics with known bias and variance that can be validated with anatomically and physiologically relevant measures, including treatment response (and the heterogeneity of that response) and outcome. Such non-invasive quantitative measures can then be used effectively in clinical and translational research and will contribute significantly to the goals of precision medicine. This presentation will focus on 1) outlining the opportunities for QIB applications, with examples to demonstrate applications in both research and patient care, 2) discussing key challenges in the implementation of QIB applications, and 3) providing overviews of efforts to address such challenges from federal, scientific, and professional organizations, including, but not limited to, the RSNA, NCI, FDA, and NIST.

[1]Sullivan, Obuchowski, Kessler, et al. Radiology, epub August 2015.

BIOGRAPHY: **Dr. Edward Jackson** is Professor and Chair of the Department of Medical Physics and Professor of Radiology and Human Oncology at the University of Wisconsin-Madison School of Medicine and Public Health. He is the current chair of the RSNA Quantitative Imaging Biomarkers Alliance (QIBA) and is past chair of the ISMRM Ad Hoc Committee on Standards for Quantitative MR. He is a member of the AAPM Science Council and Education Council, and is chair-elect of the Commission on Accreditation of Medical Physics Education Programs (CAMPEP). Dr. Jackson is a fellow of the AAPM and the ACR.

AWARD FINALISTS

Join us on Monday at 4:00 pm in the Town & Country Room for the recognition of the conference finalists and an announcement of the first place winner and runner up.

CONGRATULATIONS CONFERENCE FINALISTS

The following student authors will advance to the final round of the Robert F. Wagner Best Student paper competition. Their papers were chosen from 59 submissions.

PHYSICS OF MEDICAL IMAGING (9783)

Rayleigh imaging in spectral mammography
Paper 9783-7
Student Author: **Karl Berggren,** KTH Royal Institute of Technology (Sweden) and Philips Healthcare (Sweden)

Design, fabrication, and implementation of voxel-based 3D printed textured phantoms for task-based image quality assessment in CT
Paper 9783-76
Student Author: **Justin Solomon,** Carl E. Ravin Advanced Imaging Labs., Duke Univ. (USA)

IMAGE PROCESSING (9784)

Contour tracking and probabilistic segmentation of tissue phase mapping MRI
Paper 9784-3
Student Author: **Teodora Chitiboi,** Fraunhofe MEVIS (Germany) and Jacobs Univ. Bremen (Germany)

Combined registration and motion correction of longitudinal retinal OCT data
Paper 9784-32
Student Author: **Andrew Lang,** Johns Hopkins Univ. (USA)

COMPUTER-AIDED DIAGNOSIS (9785)

Deep convolutional neural networks for automatic coronary calcium scoring in a screening study with low-dose chest CT
Paper 9785-36
Student Author: **Nikolas Lessmann,** Univ. Medical Ctr. Utrecht (Netherlands)

Radiomics versus physician assessment for the early prediction of local cancer recurrence after stereotactic radiotherapy for lung cancer
Paper 9785-50
Student Author: **Sarah Mattonen,** Western Univ. (Canada) and Baines Imaging Research Lab., London Regional Cancer Program (Canada)

IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING (9786)

MIND Demons for MR-to-CT deformable image registration in image-guided spine surgery
Paper 9786-16
Student Author: **Sureerat Reaungamornrat,** Johns Hopkins Univ. (USA)

Image-guided preoperative prediction of pyramidal tract side effect in deep brain stimulation
Paper 9786-29
Student Author: **Clément Baumgarten,** INSERM (France) and Univ. of Rennes 1 (France)

IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT (9787)

The classification of normal screening mammograms
Paper 9787-15
Student Author: **Zoey Ang,** The Univ. of Sydney (Australia)

BIOMEDICAL APPLICATIONS IN MOLECULAR, STRUCTURAL, AND FUNCTIONAL IMAGING (9788)

Modeling the brain morphology distribution in the general aging population
Paper 9788-17
Student Author: **Wyke Huizinga,** Erasmus MC (Netherlands)

A semi-automatic framework of measuring pulmonary arterial metrics at anatomic airway locations using CT imaging
Paper 9788-41
Student Author: **Dakai Jin,** Univ. of Iowa, (USA)

PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS (9789)

A handheld computer-aided diagnosis system and simulated analysis
Paper 9789-23
Student Author: **Ming Jian Su,** Guangxi Univ. (China)

ULTRASONIC IMAGING AND TOMOGRAPHY (9790)

Development and evaluation of a novel VEGFR2-targeted nanoscale ultrasound contrast agents
Paper 9790-28
Student Author: **Houqiang Yu,** Huazhong Univ. of Science and Technology (China)

Dynamic programing on a tree for ultrasound elastography
Paper 9790-50
Student Author: **Roozbeh Shams,** Concordia Univ. (Canada)

DIGITAL PATHOLOGY (9791)

Evaluating stability of histomorphometric features across scanner and staining variations: predicting biochemical recurrence from prostate cancer whole slide images
Paper 9791-25
Student Author: **Patrick Leo,** Case Western Reserve Univ. (USA)

Cell nuclei attributed relational graphs for efficient representation and classification of gastric cancer in digital histopathology
Paper 9791-31
Student Author: **Harshita Sharma,** Technische Univ. Berlin (Germany)

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.

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Contributions by the Medical Imaging Community

CONGRATULATIONS TO THE 2015 ROBERT F. WAGNER BEST STUDENT PAPER AWARD RECIPIENTS

1ST PLACE

Ibrahim Sadek, Univ. de Bourgogne (France)

Automatic discrimination of color retinal images using the bag of words approach [9414-54]

RUNNER-UP

Fumin Guo, Robarts Research Institute (Canada)

Automated pulmonary lobar ventilation measurements using volume-matched thoracic CT and MRI [9417-42]

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PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS
CONFERENCE 9789 · Paper Number 9789-100

Connecting Images to the Electronic Medical Record: Structured Reporting, Machine Learning, and Natural Language Processing

Sunday 28 February 2016
8:40 to 9:40 am · Location: San Diego

Curtis Langlotz
Stanford Univ. Medical Ctr. (USA)

ABSTRACT: The imaging report is an essential source of clinical imaging information. It documents critical information about the patient's health and provides a professional interpretation of the images. However, the vast majority of report information remains narrative, a major obstacle to the rapid extraction and re-use of discrete imaging data. Structured reporting facilitates linking of imaging observations to clinical and genomic data, and is increasingly being adopted by clinical imaging practices. However, most imaging reports are used only once by the clinician who ordered the imaging study and are rarely used again for clinical care, research, or analytics. This presentation will describe the likely future of the imaging report, including efforts underway to standardize radiology report information, and the use of machine learning and natural language processing techniques to extract the semantic elements of the radiology report. These novel technologies enable connections between images and the electronic health record, and represent a vital part of medical imaging's future.

BIOGRAPHY: **Dr. Langlotz** has published over 100 scholarly articles, and is author of the recently published book "The Radiology Report: A Guide to Thoughtful Communication for Radiologists and Other Medical Professionals". Over the past decade, Dr. Langlotz has led many national and international efforts to improve the quality of radiology reporting, including the RadLex terminology standard, the RadLex Playbook of radiology exam codes, and the report template library of the Radiological Society of North America. His research is focused on improving the accuracy and consistency of radiology communication through real-time decision support systems and other information technologies. His biomedical informatics laboratory develops novel machine learning and natural language processing algorithms that provide intelligent assistance to radiologists, clinicians, patients, and other consumers of images and reports.

PHYSICS OF MEDICAL IMAGING
CONFERENCE 9783 · Paper Number 9783-12

EXPLORER: Changing the Molecular Imaging Paradigm with Total-Body PET/CT

Sunday 28 February 2016
1:20 to 2:20 pm • Location: Town & Country

Simon Cherry
Univ. of California, Davis (USA)

ABSTRACT: Positron emission tomography (PET) is the highest sensitivity technique for human whole-body imaging studies. However, current clinical PET scanners do not make full use of the available signal, as they only permit imaging of a 15-25 cm segment of the body at one time. Given the limited sensitive region, whole-body imaging with clinical PET scanners requires relatively long scan times and subjects the patient to higher than necessary radiation doses.
The EXPLORER initiative aims to build a 2-meter axial length PET scanner to allow imaging the entire subject at once, capturing nearly the entire available PET signal. EXPLORER will acquire data with ~40-fold greater sensitivity leading to a six-fold increase in reconstructed signal-to-noise ratio for imaging the total body. Alternatively, total-body images with the EXPLORER scanner will be able to be acquired in ~30 seconds or with ~0.15 mSv injected dose, while maintaining current PET image quality.
The superior sensitivity will open many new avenues for biomedical research. Specifically for cancer applications, high sensitivity PET will enable detection of smaller lesions. Additionally, greater sensitivity will allow imaging out to 10 half-lives of positron emitting radiotracers. This will enable 1) metabolic ultra-staging with FDG by extending the uptake and clearance time to 3-5 hours to significantly improve contrast and 2) improved kinetic imaging with short-lived radioisotopes such as C-11, crucial for drug development studies. Frequent imaging studies of the same subject to study disease progression or to track response to therapy will be possible with the low dose capabilities of the EXPLORER scanner. The low dose capabilities will also open up new imaging possibilities in pediatrics and adolescents to better study developmental disorders. This talk will review the basis for developing total-body PET, potential applications, and review progress to date in developing EXPLORER, the first total-body PET scanner

BIOGRAPHY: **Dr. Cherry's** research interests center around biomedical imaging and in particular the development and application of in vivo molecular imaging systems. His major accomplishments have been in developing and applying high resolution systems for positron emission tomography (PET), in particular the invention of the microPET technology that was subsequently widely adopted in academia and industry. He has contributed to the development of very high performance detectors for PET, and to multimodality imaging systems, including the first hybrid PET/MRI (magnetic resonance imaging) systems. He is currently co-leading the effort to develop the world's first total body PET scanner.

CONFERENCE KEYNOTE PRESENTATIONS

COMPUTER-AIDED DIAGNOSIS

CONFERENCE 9785 · Paper Number 9785-23

Radiomics: There is More than Meets the Eye in Medical Imaging

Monday 29 February 2016
8:00 am to 9:00 am • Location: Golden West

Hugo Aerts
Dana-Farber Cancer Institute, Brigham and Women's Hospital, Harvard Medical School (USA)

ABSTRACT: Imaging-based techniques have traditionally been restricted to the diagnosis of cancer and staging of cancer. But technological advances are moving imaging modalities into the heart of patient care. Radiomics uses imaging assays to develop biomarkers which complement those derived from biopsies. The ultimate goal of radiomics is to improve personalized medicine strategies by allowing clinicians to monitor disease in real time as patients move through treatment. Several studies in different cancer types have demonstrated that radiomic biomarkers have strong prognostic performance, and are associated with underlying mutation and gene-expression patterns. In this talk, Dr. Aerts will discuss recent developments from his lab and collaborators performing research at the intersection of radiology and bioinformatics. Also, he will discuss recent work of building a computational image analysis system to extract a rich radiomics set and use these features to build prognostic radiomics signatures. The presentation will conclude with a discussion of future work on building integrative systems incorporating both molecular and phenotypic data to improve cancer therapies.

BIOGRAPHY: **Dr. Hugo Aerts** is Director of the Computational Imaging and Bioinformatics Laboratory (CIBL) at Harvard-DFCI. Dr. Aerts' group focuses on the development and application of advanced computational approaches applied to medical imaging data, pathology, and genomic data. Furthermore, he is a PI-member of the Quantitative Imaging Network (QIN) and Informatics Technology for Cancer Research (ITCR) initiative of the NIH.

ULTRASONIC IMAGING AND TOMOGRAPHY

CONFERENCE 9790 · Paper Number 9790-25

Enhanced Ultrasound, Ultrasound Tomography for Volume Limb Imaging and Prosthetic Fitting

Monday 29 February 2016
10:10 to 11:10 am · Location: Royal Palm One

Brian Anthony
Massachusetts Institute of Technology (USA)

ABSTRACT: Ultrasound imaging methods hold the potential to deliver low-cost, high-resolution, operator-independent and non-ionizing imaging systems – such systems couple appropriate algorithms with imaging devices and techniques. The increasing demands on general practitioners motivate us to develop more usable and productive diagnostic imaging equipment. Ultrasound, specifically freehand ultrasound, is a low cost and safe medical imaging technique. It doesn't expose a patient to ionizing radiation. Its safety and versatility make it very well suited for the increasing demands on general practitioners, or for providing improved medical care in rural regions or the developing world. However it typically suffers from sonographer variability; we will discuss techniques to address user variability. As with any medical imaging technique, methods are developed for imaging specific regions of the body; ultrasound is typically used to image soft tissues of the body. Ultrasound methods have been developed for applications involving pre-natal health, cardiac imaging, detection of breast cancer and therapeutic uses, however, ultrasound systems for 3-D imaging and quantification of hard tissues like bone in vivo are currently non-existent. We will discuss our work to combine cylindrical scanning systems with state of the art inversion algorithms to deliver ultrasound systems for imaging and quantifying limbs in 3-D in vivo. Such systems have the potential to track the progression of bone health at a low cost and without radiation exposure, as well as, improve prosthetic socket fitting. Current methods of prosthetic socket fabrication remain subjective and ineffective at creating an interface to the human body that is both comfortable and functional. Though there has been recent success using methods like magnetic resonance imaging and biomechanical modeling, a low-cost, streamlined, and quantitative process for prosthetic cup design and fabrication has not been fully demonstrated. Medical ultrasonography may inform the design process of prosthetic sockets in a more objective manner. This talk presents the results of progress in this area.

BIOGRAPHY: **Dr. Anthony** is Co-Director of MIT's Medical Electronic Device Realization Center, Director of MIT's Master of Engineering in Manufacturing Program. He designs instruments and techniques to monitor and control physical systems. His work involves systems analysis and design, calling upon mechanical, electrical and optical engineering, along with computer science and optimization, to create solutions. Dr. Anthony won an Emmy - from the Academy of Television Arts and Sciences - in broadcast technical innovation using high-speed video.

IMAGE PROCESSING

CONFERENCE 9784 · Paper Number 9784-6

Image Processing Pipelines: Applications in Magnetic Resonance Histology

Tuesday 1 March 2016
10:10 to 11:10 am • Location: San Diego

G. Allan Johnson
Duke Ctr. for In Vivo Microscopy (USA)

ABSTRACT: Image processing has become ubiquitous in virtually all imaging research—so ubiquitous that it is easy to loose track of how diverse this processing has become. The Duke Center for In Vivo Microscopy has pioneered the development of Magnetic Resonance Histology (MRH), which generates large multi-dimensional data sets that can easily reach into the 10s of gigabytes. A series of dedicated image-processing workstations and associated software have been assembled to optimize each step of acquisition, reconstruction, post-processing, registration, visualization, and dissemination. This talk will describe the image-processing pipelines from acquisition to dissemination that have become critical to our everyday work.

BIOGRAPHY: **Dr. G. Allan Johnson** completed his Ph.D. in physics under Duke Professor Walter Gordy in 1974. He joined the Department of Radiology that same year where he worked on the first CT system at Duke. From 1979-2009 he served as Director of Diagnostic Physics, where he was engaged in translating CT and MR technology into application. He was responsible for the installation of the world's first clinical high-field (1.5 T) MR system from 1982-1989. He founded the Center for In Vivo Microscopy http://www.civm.duhs.duke.edu/ in 1986. He is the inaugural Charles E. Putman Professor of Radiology, Physics, and Biomedical Engineering.

IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING

CONFERENCE 9786 · Paper Number 9786-49

Robot-Assisted Tumor Resection: Palpation, Incision, Debridement, and Adhesive Closure

Tuesday 1 March 2016
1:20 to 2:20 pm · Location: California

Ken Goldberg
Univ. of California, Berkeley (USA)

ABSTRACT: With Doug Boyd at UC Davis, we are developing tooling and learning algorithms to facilitate supervised automation of surgical subtasks. We'll discuss our recent work on palpation, dissection, retraction, debridement, and adhesive closure.

BIOGRAPHY: **Ken Goldberg** is an artist and UC Berkeley professor. He and his students investigate robotics, automation, art, and social media. Ken is Director of the People and Robots Initiative (a CITRIS multicampus multidisciplinary research program established in April 2015) and UC Berkeley's Automation Sciences Research Lab (since 1995). Ken earned dual degrees in Electrical Engineering and Economics from the University of Pennsylvania (1984) and MS and PhD degrees from Carnegie Mellon University (1990). He joined the UC Berkeley faculty in 1995 where he is Professor of Industrial Engineering and Operations Research (IEOR), with secondary appointments in Electrical Engineering/Computer Science (EECS), Art Practice, the School of Information, and in the Department of Radiation Oncology at the UCSF Medical School.

Ken has published over 200 peer-reviewed technical papers on algorithms for robotics, automation, and social information filtering; his inventions have been awarded eight US Patents. He is Editor-in-Chief of the IEEE Transactions on Automation Science and Engineering (T-ASE), Co-Founder of the Berkeley Center for New Media (BCNM), the African Robotics Network (AFRON), the Center for Automation and Learning for Medical Robotics (CAL-MR), the CITRIS Data and Democracy Initiative (DDI), Hybrid Wisdom Labs, and Moxie Institute.

Ken's art installations are related to his research and have been exhibited at venues including the Whitney Biennial, Berkeley Art Museum, SF Contemporary Jewish Museum, Pompidou Center, Buenos Aires Biennial, and the ICC in Tokyo. Ken co-wrote three award-winning Sundance documentary films, "The Tribe", "Yelp", and "Connected: An Autoblogography of Love, Death, and Technology" and co-directed the Emmy-Nominated Short Doc "Why We Love Robots." Ken's artwork is represented by the Catharine Clark Gallery in San Francisco and he is Founding Director of UC Berkeley's Art, Technology, and Culture Lecture Series (since 1997).

Ken was awarded the Presidential Faculty Fellowship in 1995 by Bill Clinton, the National Science Foundation Faculty Fellowship in 1994, the Joseph Engelberger Robotics Award in 2000, and elected IEEE Fellow in 2005. He lives in the Bay Area with his daughters and wife, filmmaker and Webby Awards founder Tiffany Shlain.

BIOMEDICAL APPLICATIONS IN MOLECULAR, STRUCTURAL, AND FUNCTIONAL IMAGING

CONFERENCE 9788 · Paper Number 9788-15

Interesting *in-Vivo* Magnetic Resonance Experiments that are Not Quite Ready for Prime Time and Some that Are!

Wednesday 2 March 2016
10:10 to 11:10 am · Location: Royal Palm One

Joseph Ackerman
Washington Univ. in St. Louis (USA)

ABSTRACT: Magnetic resonance imaging (MRI) offers the advantages of full field-(depth)-of-view, no exposure to ionizing radiation, and myriad endogenous (and exogenous) contrasts. Disadvantages are related to low signal-to-noise sensitivity, which for biomedical related experiments relegates most protocols to detection of the water 1H (proton) MR signal and, for a given contrast, results in long scanning times (minutes). Despite these limitations, MRI has proven to provide remarkable functional and structural insights into intact functioning biological systems, from the cultured cell to mouse to man.

Our laboratory and collaborators are focused on the development and implementation of MRI methods that elucidate and take advantage of the biophysics underlying the "structure" of the MR signal to more deeply characterize tissue biology and pathophysiology. This presentation will focus on four active areas of investigation: (i) development of a mouse model of Gamma Knife-induced late time-to-onset radiation necrosis and the subsequent monitoring of its remarkable drug-enabled mitigation, (ii) use of N-acetyl-aspartate (NAA) as an MR-active intra-neuronal marker of "intracellular" diffusion, and changes therein in stroke, (iii) measurement of the intracellular water residence/pre-exchange lifetime in neurons and in astrocytes via the "Brains-on-Beads" system, and (iv) determination of the longitudinal (spin-lattice) 1H MR relaxation of tissue water to map dissolved oxygen content (pO2).

BIOGRAPHY: **Joseph J. H. Ackerman, Ph.D.,** is the William Greenleaf Eliot Professor of Chemistry at Washington University in Saint Louis and holds joint appointments in the Departments of Radiology and Internal Medicine. Ackerman received his Chemistry B.A. from Boston University and Ph.D. from Colorado State University. He was an NIH Postdoctoral Fellow at the University of Oxford, Oxford, UK. Ackerman is a Gold Medal awardee and Fellow of the International Society for Magnetic Resonance in Medicine (ISMRM).

DIGITAL PATHOLOGY

CONFERENCE 9791 · Paper Number 9791-1

Current Challenges in Digital Pathology

Wednesday 2 March 2016
1:20 to 2:20 pm · Location: Golden West

Kenneth Bloom
Clairent, Inc. (USA)

ABSTRACT: Digital Pathology is an enabling technology that holds the promise to transform anatomic pathology into an objective science, but major hurdles still exist. The regulatory landscape of WSI (whole slide imaging) is still evolving. In the United States, the US Food and Drug Administration has indicated that WSI systems are class III medical devices and thus will require premarket approval. Several vendors are in the process of obtaining approval to use these systems for primary diagnosis, but the value of digital pathology extends far beyond replacing the microscope. Once untethered from the microscope pathologists will be able to utilize the full power of the next generation of tools and techniques waiting to be developed. Multiplexing, machine learning, quantitative image analysis, interpreting spatial relationships and integration with other large data sets are but a few of the applications waiting to be perfected. I will discuss the current challenges in digital pathology, where and how I believe basic research will be most effective and future trends in pathology.

BIOGRAPHY: **Kenneth J. Bloom, MD** has been the Chief Medical Officer since 2005 and was the original Medical Director of Clarient Diagnostic SeNices. Dr. Bloom's career spans more than 30 years including key positions in start-up companies, University-based Medical Centers and commercial laboratories. As on early adopter of information technology, Dr. Bloom developed the Pathology Information System at Rush Medical Center and helped design the hospital's Tumor Registry and Surgical Information System. Using this technology, Dr. Bloom co-founded Initiate Systems, which just prior to its sale to IBM. was estimated to hold an 80% share of the software market that linked individual patient records across various healthcare databases. During his residency, Dr. Bloom developed the first commercial Telepathology system and co-authored the key technical papers. He was an invited speaker at the First International Conference on Clinical Application ofTelemedicine in Tromso. Norway in 1993.

Dr. Bloom came to Clarient from Irvine CA-based U.S. Lobs, where he served as Senior Medical Director since 2002. Dr. Bloom's academic posts have included Clinical Professor of Pathology at USC, Keck School of Medicine, Associate Professor of Pathology at Rush Medical College and one year as a visiting Professor in the Department of Computer Science at DePaul University. Over the past 15 years. Dr. Bloom hos held more than 10 appointed positions at Chicago-based Rush Presbyterian-St. Luke's Medical Center. one of the leading cancer research hospitals in the US. Those positions included Director of Laboratory Operations, Director of Immunohistochemistry, Consultant to the Rush Breast Cancer Center, and Director of Information Services for the Rush Cancer Institute.

IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT

CONFERENCE 9787 · Paper Number 9787-1

Image Perception Foundation of Success for NLST

Thursday 3 March 2016
8:00 to 9:00 am · Location: California

Francine Jacobson
Brigham & Women's Hospital (USA)

ABSTRACT: The introduction of helical CT, allowing imaging of lungs during a single breath-hold provided unprecedented non-invasive visualization of lung parenchyma. Advances in technology required a new paradigm for viewing CT and MR images. My image perception research began with the exploration of stacked image viewing, serving as an observer and as an investigator of features that drew radiologist attention while searching for simulated nodules in known locations. Nodule detection is fundamental to lung cancer screening CT. Multidetector CT technology has continued to increase our understanding of the features of early lung cancer and lung parenchyma. Precision medicine demands attention to many previously overlooked features that have phenotypic significance for disease classification, treatment, and outcome. Quantitative evaluation of lung parenchyma now provides valuable data although subjective evaluation by the expert observer remains important for validation of findings and identification of subtle features that do not lend themselves to quantitative measurement. The potential for lung cancer screening CT to improve health extends beyond cancer to the detection of subtle lung disease and coronary artery calcifications. Radiologists face new challenges for integration of quantitative and qualitative information at a level usually associated with clinical trials for the 9 million Americans who meet current lung cancer screening CT guidelines. It is time for new paradigms in image viewing and assessment of technology and observer performance that are central to image perception science.

BIOGRAPHY: **Dr. Francine Jacobson** piloted the MD-MPH program and the University of Miami School of Medicine receiving both degrees in May, 1986, followed by internship and residency at Maine Medical Center, and fellowship in thoracic radiology at Brigham and Women's Hospital. She joined the faculty in 1992 and currently oversees The Brigham and Women's Health Care Lung Cancer Screening program at Brigham and Women's Hospital, Dana-Farber Cancer Institute, Brigham and Women's Faulkner Hospital, and Cape Cod Hospital. She served as the initial site PI for NLST, co-chaired the AATS Task Force for Lung Cancer Screening and Surveillance, and currently serves as site radiologist for COPDGene.

TECHNICAL WORKSHOPS

These technical workshops are included with your registration.

SUNDAY WORKSHOPS · 5:45 to 7:45 pm

Interventional Procedures: Emerging Technologies and Clinical Applications

WK1 TECHNICAL WORKSHOP: PHYSICS OF MEDICAL IMAGING (CONFERENCE 9783) AND IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS AND MODELING (CONFERENCE 9786)

Sunday 28 February 2016 • 5:45 to 7:45 pm
Location: Town & Country

WORKSHOP CHAIRS:
Despina Kontos, The Univ. of Pennsylvania Health System (USA)
Ziv Yaniv, National Library of Medicine (USA)

Recent advances in the technology of interventional imaging are currently making possible unprecedented opportunities for innovative procedures that will change clinical management of patients to more accurately detect disease and better guide therapeutic procedures. From novel angiography techniques, to artery embolization, radiofrequency ablation, and minimally-invasive surgery, these advances are moving Interventional Radiology towards a more personalized, precision medicine approach, that will improve both patient quality of life and long-term outcomes. This workshop will include a panel of experts that will cover topics from developments in basic imaging science and imaging technology engineering, to commercial product development and translation in clinical applications, aiming to provide a broad overview of recent advances in interventional imaging procedures and spearhead related discussion among panel attendees.

SPEAKERS:

Terry Peters, Robarts Research Institute (USA)
Imaging Systems for Minimally-Invasive Surgery

Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA)
Interventional Imaging Technologies for Therapy Guidance

Kullervo Kynnyen, Sunnybrook Health Sciences Ctr. (Canada)
Applications of Non-Invasive Surgery and Targeted Therapeutics

Dorin Comaniciu, Siemens Healthcare (USA)
Technology Transfer of Interventional Imaging Technologies to the Clinic

Sensing Challenges and Prospects in Miniaturizing Surgical Robots and Tools

WK4 TECHNICAL WORKSHOP: IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING (CONFERENCE 9786)

Sunday 28 February 2016 • 5:45 to 7:45 pm
Location: California

WORKSHOP CHAIR:
Jessica Burgner-Kahrs, Leibniz Univ. Hannover (Germany)

The workshop brings together experts in computer aided and robot-assisted surgery and experts in small scale sensor technology. The current challenges in further miniaturizing surgical robots and tools in terms of mechanical and sensory requirements will be elaborated. We will in particular regard needle-size surgical manipulators such as concentric tube continuum robots which are very promising for minimally invasive interventions through natural orifices such as transnasal skull base surgery and transurethral urologic surgery. Afterwards, current developments in flexible electronics and miniaturized sensors will be presented. Finally, we will discuss integration requirements and prospects for surgical applications in a panel discussion.

Each speaker will give a short presentation followed by a panel discussion.

PANELISTS:

Jenny Dankelman, TU Delft (Netherlands)
Novel designs to miniaturize needles, catheters, and surgical tools

Dan Popa, Univ. of Louisville (USA)
A view from microns and millimeters to human size

Robert J. Webster III, Vanderbilt Univ. (USA)
Why the design, sensing, and planning communities must collaborate to create optical surgical robots

SPIE/IFCARS JOINT WORKSHOP

Information Management, Systems Integration, Standards, and Approval Issues for the Digital Operating Room

WK7 COMPUTER AIDED DIAGNOSIS (CONFERENCE 9785) AND PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS (CONFERENCE 9789)

Sunday 28 February 2016 • 5:45 to 7:45 pm
Location: Golden West

WORKSHOP CHAIRS:
Leonard Berliner, New York Methodist Hospital (USA)
Heinz Lemke, Computer Assisted Radiology and Surgery (Germany)

It has been challenging to put into practice in the Operating Room (OR many of the new technological and system advances, associated interventional procedures and the corresponding redesign of healthcare infrastructures. Four main areas of technology development for the Digital OR (DOR) can be identified:

1. Devices, including signal detection and recording, robotics, guidance systems, simulation technologies, which allow precision in the delivery of personalized operative healthcare;
2. IT Infrastructure, including DICOM, IHE, EMR, Therapy Imaging and Model Management System (TIMMS) infrastructure for the storage, integration, processing and transmission of patient specific data;
3. Functionalities, including specific interventional processes, patient specific modelling, optimization of surgical workflow, TIMMS engines and,
4. Visualization, including the processing, transmission, display and storage of images, video, and physiologic signals (e.g. a type of surgical PACS).

A PACS-like architecture and its application for the management of image and model guided therapy has been the subject of discussions in the DICOM and IHE standard activities. With the initiation of the new IHE Surgery Domain, this SPIE / IFCARS Joint Workshop focuses on presentations and discussions on topics such as:

- The Digital OR infrastructure and IHE Surgery
- OR.NET - the German OR-IT integration project
- SCOT - the Japanese OR-IT integration project
- MD PnP – a USA OR-IT integration project
- Viewpoints from industry and bridging the Radiology - Surgery gap
- IHE Surgery Planning and Technical Committee Work Tasks
- Proposal for IHE Integration Profiles,
- Approval and certification strategies

PANELISTS/SPEAKERS:

Yoshihiro Muragaki, Tokyo Women's Medical University, (Japan)
Kirby Vosburgh, Brigham and Women's Hospital, (USA)
Ron Schilling, EchoPixel, Inc., (USA)
Erik Schreiber, University of Leipzig, ICCAS, (Germany)
Armin Janss, RWTH, Aachen, (Germany)
David Hilderbrand, 3si Surgical Workflow (USA)

TECHNICAL PANEL AND WORKSHOPS

TUESDAY PANEL · 3:30 to 4:50 pm

SPIE-AAPM-NCI PANEL DISCUSSION

CAD Grand Challenges: Paving the Way for Imaging in the Era of Precision Medicine

Tuesday 1 March 2016 • 3:30 to 4:50 pm
Location: Golden West

MODERATOR:
Samuel G. Armato III, The Univ. of Chicago (USA)

PANELISTS:

Maryellen Giger, The Univ. of Chicago (USA)

Ronald M. Summers, National Institutes of Health (USA)

Joel H. Saltz, Stony Brook Univ. (USA)

Fabrice Meriaudeau, Univ. de Bourgogne (France)

Hugo Aerts, Dana-Farber Cancer Institute (USA)

As part of the 2016 SPIE Medical Imaging Symposium, the CAD Conference will host a panel discussion to explore current imaging challenges that are worthy of becoming the subject of a future CAD Grand Challenge. The successful LUNGx Challenge that was held in conjunction with the 2015 SPIE Medical Imaging Symposium (Armato III, et al., *Journal of Medical Imaging*, 2015) involved quantitative image analysis methods (radiomics) for the classification of malignant and benign lung nodules on thoracic CT scans—an important and clinically significant issue, but one that has been under investigation for decades. This panel discussion will encourage attendees to think about the next generation of radiologic tasks that should be advanced through the commitment of a Grand Challenge. The panel also will touch on the technical requirements necessary to develop an open-source informatics infrastructure for the support of grand challenges and the evaluation of clinical support systems.

TUESDAY WORKSHOPS · 5:00 to 7:00 pm

Image Synthesis

WK2 IMAGE PROCESSING (CONFERENCE 9784)

Tuesday 1 March 2016 • 5:00 to 7:00 pm
Location: San Diego

WORKSHOP CHAIRS:

Jerry Prince, Johns Hopkins Univ. (USA)

Sebastien Ourselin, Univ. College London (United Kingdom)

Acquisition of truly calibrated magnetic resonance images is not currently possible. Scanners and pulse sequences are different—in subtle ways sometimes and quite dramatic ways more often. As a consequence, the use of MR images for automatic image analysis yields inconsistent results. Image synthesis can be used to normalize and impute imaging data from missing pulse sequences, both of which can improve subsequent image processing steps such as segmentation and registration. Cross modality synthesis can also be used to create patient-specific models and priors, informing complex image analysis processes such as the reconstruction of PET/MR data using MR-derived synthetic CT images.

These are just two key applications where image synthesis is proving to be useful in medical imaging. In fact, there has been considerable recent research on both the methods and applications of image synthesis in medical imaging. Despite literature on the general topic going back at least two decades, however, its practice remains somewhat controversial. This workshop will be split into three parts. First, the chairs will present a historical background on image synthesis, framing key developments in medical imaging, computer vision, and image processing that relate to the current practice. Second, the speakers will describe key methods that have been shown to work well for certain modern applications. Third, the chairs and speakers will together form a panel to engage the audience in a conversation about the current practice and applications of image synthesis and to speculate about its future.

WORKSHOP SPEAKERS:

Snehashis Roy, Henry M. Jackson Foundation (USA)

M. Jorge Cardoso, Univ. College London (United Kingdom)

Live Demonstrations

WK3 TECHNICAL WORKSHOP: COMPUTER-AIDED DIAGNOSIS (CONFERENCE 9785)

Tuesday 1 March 2016 • 5:00 to 7:00 pm
Location: Grand Exhibit Hall

WORKSHOP CHAIRS:

Dr. Heang-Ping Chan, Univ. of Michigan Health System, (USA)

Dr. Horst Hahn, Fraunhofer MEVIS, (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging.

The Live Demonstration Workshop will be held as part of the 2016 SPIE Medical Imaging Conference on Tuesday, 1 March 2016 from 5:00 pm to 7:00 pm.

The Live Demonstration Workshop invites participation from all of the conferences that comprise the SPIE Medical Imaging Conference. We encourage the CAD, Digital Pathology, Image Processing, PACS, Perception, Physics, Visualization, and all other conferences to participate.

This workshop features interactive demonstrations that are complementary to the topics of SPIE Medical Imaging. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a Live Demonstration; however, authors of SPIE Medical Imaging papers are encouraged to submit demonstrations that are complimentary to their oral and poster presentations.

Validation of Medical Image-Perception Models

WK5 IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSIESSMENT (CONFERENCE 9787)

Tuesday 1 March 2016 • 5:00 to 7:00 pm
Location: California

WORKSHOP CHAIRS:

Craig K. Abbey, Univ. of California, Santa Barbara, (USA)

Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona, (USA)

Computational models that perform or mimic the performance of diagnostic tasks are playing a greater role in support of improved diagnoses in medical imaging. Examples of applications in which such models are used include computer-aided diagnosis, display calibration, and image quality assessment. Given the breadth and complexity of perceptual processes in medical imaging, appropriate validation of models is a crucial component of their development.

This workshop will focus on rigorous methods to validate models of perception and performance in diagnostic tasks. The panel will present various perspectives on this topic, including the relation to general prediction algorithms, validation of optimal models, validation of CAD algorithms, and broader clinical considerations in model validation.

PANELISTS:

Craig K. Abbey, Univ. of California, Santa Barbara, (USA)

Jovan G. Brankov, Illinois Institute of Technology, (USA)

Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona, (USA)

Frank W. Samuelson, U.S. Food and Drug Administration (USA)

Robert M. Nishikawa, Univ. of Pittsburgh (USA)

NIH Funding Opportunities: Navigating the System and Tips for Applicants

WK6 PHYSICS OF MEDICAL IMAGING (WK6 PHYSICS OF MEDICAL IMAGING (9783)

Tuesday 1 March 2016 • 5:00 to 7:00 pm
Location: Town & Country

WORKSHOP CHAIR:
Antonio Sastre, National Institute of Biomedical Imaging and Bioengineering (USA)

The Workshop will provide an introduction and refresher to NIH funding opportunities for both beginners and more experienced applicants. Topics to be covered include:

- how to find your "home" among the 24 NIH Institutes and Centers that fund grants,
- how to select the best grant mechanism for your research topic, the state of development of your ideas and the amount of supporting preliminary data,
- how to evaluate the best fit between your grant application and the many review panels at the NIH Center for Scientific Review,
- suggestions and program perspective on how to structure grant applications to best convey your ideas,
- guidance on the various NIH staff who are available to help at different stages of the process.

The Workshop will also cover the very different programmatic and review considerations for some of the more common grant mechanisms, such as R21s, R01s, and BRPs.

COURSES

MONEY-BACK GUARANTEE

We are confident that once you experience an SPIE course for yourself you will look to us for your future education needs. However, if for any reason you are dissatisfied, we will gladly refund your money. We just ask that you tell us what you did not like; suggestions for improvement are always welcome.

CONTINUING EDUCATION UNITS

SPIE has been approved as an accredited provider of CEUs by IACET, The International Association for Continuing Education and Training (Provider #1002091). In obtaining this approval, SPIE has demonstrated that it complies with the ANSI/IACET Standards which are widely recognized as standards of good practice.

SPIE has applied to CAMPEP to award MPCECs (Medical Physics Continuing Education Credits) for courses at Medical Imaging 2015. If you attend one of our Medical Imaging courses and meet CAMPEP's qualifications you may apply for these credits at no charge. CAMPEP is a continuing professional education accreditation organization specific to the medical imaging community.

SPIE reserves the right to cancel a course due to insufficient advance registration.

GET SMARTER

Get training and access to professional development courses to stay competitive and advance your career.

Fundamentals of Medical Image Processing and Analysis

SC086 •Course Level: Intermediate • CEU: 0.65
$570 Members | $660 Non-Members USD
Saturday 8:30 am to 5:30 pm

Instructor: **Thomas Deserno**

This course gives an overview of medical image formation, enhancement, analysis, visualization, and communication with many examples from medical applications. It starts with a brief introduction to medical imaging modalities and acquisition systems. Basic approaches to display one-, two-, and three-dimensional (3D) biomedical data are introduced. As a focus, image enhancement techniques, segmentation, texture analysis and their application in diagnostic imaging will be discussed. To complete this overview, storage, retrieval, and communication of medical images are also introduced.

In addition to this theoretical background, a 45 min practical demonstration with ImageJ is given. For this course, ImageJ is appropriately configured with useful plug-ins (e.g. DICOM import, 3D rendering) and distributed on CD-ROM. Attendees are welcome to perform on their own laptop computers.

Graph Algorithmic Techniques for Biomedical Image Segmentation

SC1026 • Course Level: Intermediate • CEU: 0.35
$360 Members • $410 Non-Members USD
Monday 8:30 am to 12:30 pm

Instructors: **Mona Garvin** and **Xiaodong Wu**

This course provides an in-depth overview of two state-of-the-art graph-based methods for segmenting three-dimensional structures in medical images: graph cuts and the LOGISMOS (Layered Optimal Graph Image Segmentation of Multiple Objects and Surfaces) approach. Such graph-based approaches are becoming increasingly used in the medical image analysis community, in part, due to their ability to efficiently produce globally optimal three-dimensional segmentations in a single pass (not requiring an iterative numerical scheme). Additionally, LOGISMOS enables the simultaneous optimal detection of multiple surfaces in volumetric images, which is important in many medical image segmentation applications. In the first part of the course, we provide a broad overview of both graph cuts and the LOGISMOS approach, including the presentation of a number of example applications. In the second and third parts of the course, we present the algorithmic details of graph cuts and the LOGISMOS approach, respectively. In the final part of the course, we discuss the design of cost functions, which is of paramount importance in any graph-based approach.

ROC Analysis and Observer Studies to Evaluate Imaging Technology

SC1127 • Course Level: Introductory • CEU: 0.65
$570 Members • $660 Non-Members USD
Saturday 8:30 am to 5:30 pm

Instructors: **Stephen Hillis, Robert Nishikawa,** and **Frank Samuelson**

Short of a clinical trial, observer studies are used to measure the performance of radiologists and to compare different imaging technologies with the aim of understanding how the technology might be used clinically. The goal of this course is to provide guidance on how to design, conduct, and analyze an observer study. We will examine how to plan an observer study, step by step, and then how to implement the plan in detail. The focus will be on pitfalls and common mistakes.

We will review basic ROC analysis and commonly used methods for analyzing multireader, multicase (MRMC) ROC observer data. Related software and sample-size estimation will also be discussed and demonstrated using real datasets.

The participants will take part in some simulated reader studies using a computer interface, compete for prizes, and depart with a better understanding of reader studies of diagnostic imaging devices.

Class participants should bring a laptop or tablet computer to the course. Participants will use this computer for analyzing data, performing sample-size estimation, and participating in live interactive reader studies.

Photon Counting X-ray Imaging: Technology and Methods

SC1129 • Course Level: Introductory • CEU: 0.35
$360 Members • $410 Non-Members USD
Sunday 1:30 pm to 5:30 pm

Instructors: **Mats Danielsson** and **Fredrik Grönberg**

This course explains the principles of photon counting detectors for spectral x-ray imaging. Typical technical implementations are described and fundamental differences to energy integrating systems are pointed out. In particular, the issues of high-rate handling and the effect of detector cross talk on energy resolution are described. Requirements on electronics for spectral imaging in computed tomography is also discussed.

A second objective of the course is to describe how energy sensitive counting detectors make use of the energy sampling of the linear attenuation coefficients of the background and target materials for any given imaging task; methods like material basis decomposition and optimal energy weighting will be explained.

REGISTRATION REQUIRED.
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PHOTONICS MEDIA

THE PULSE OF THE INDUSTRY

ITK in Biomedical Research and Commercial Applications

NEW

SC1182 • Course Level: Introductory • CEU: 0.65
$570 Members • $660 Non-Members USD
Saturday 8:30 am to 5:30 pm

Instructors: **Matthew McCormick, Stephen Aylward, Hans Johnson**, and **Bradley Lowekamp**

The Insight Segmentation and Registration Toolkit (www.itk.org) has become a standard in academia and industry for medical image analysis. In recent years, the ITK developers' community has focused on providing programming interfaces to ITK from Python, Java, and Javascript and making ITK available via leading applications such as Slicer and ImageJ.

In this course we present best practices for taking advantage of ITK in your imaging research and commercial products. Via interactive examples that attendees can run on their laptops during the course, we show how ITK can speed research and commercial product development. We demonstrate how script writing and interactive GUIs can be used to access the algorithms in ITK and the multitude of ITK extensions that are freely available on the web. We also cover the opportunities and challenges with using open-source software in research and in commercial applications: from prototypes that can lead to venture capital funding to applications for first-in-human trials and ultimately for regulatory approval.

Modern Diagnostic X-Ray Sources

NEW

SC1183 • Course Level: Introductory • CEU: 0.35
$490 Members • $540 Non-Members USD
Saturday 8:30 am to 12:30 pm

Instructor: **Rolf Behling**

This lecture will provide a sound basis for understanding the physics of production of "clinical" X-rays for diagnostics and briefly touch therapeutic use. It will treat functional principles of X-ray sources including high voltage supply. Design aspects, special features, radiation protection, and modern performance metric, manufacturing technology, and cost aspects will be discussed. Why is vacuum technology not at all outdated? Will we find the X-ray LED, compact X-ray Lasers or flat panel sources in medical imaging soon? Why do hundreds of tube types populate the market? The lecture will cover system performance aspects related to the source, material boundary conditions, and manufacturing technology.

The quest for affordable healthcare demands for trade-offs between value and cost, and objective comparison of tube types. Initial costs and costs of tube replacement will be discussed as well as means to extend tube life and to save natural resources. Last but not least, the lecture may spark fascination for this species of off-the-mainstream vacuum electronics light sources.

COURSE PRICE INCLUDES the text *Modern Diagnostic X-Ray Sources, Technology, Manufacturing, Reliability* (CRC Press, 2015) by Rolf Behling.

Methodology for Measuring Functional Connectivity in Neuroimaging Data Analysis

NEW

SC1184 • Course Level: Intermediate • CEU: 0.35
$360 Members • $410 Non-Members USD
Monday 8:30 am to 12:30 pm

Instructor: **Tianhu Lei**

A dynamic version of neuroimaging data analysis not only emphasizes the functional specifications of brain regions, but also focuses on the massively parallel nature of distributed and interacting regions that are hypothesized to process the functional tasks under investigations. Studying brain interactions leads to an emerging field: Functional Connectivity.

Functional connectivity between two brain units (neuron columns, recording sites, regions) are generally defined as the temporal correlation among their time courses. Its objective is to capture the dynamic, context-dependent processes that may lead to preferential recruitment of some units over others.

Five classical measures – Mutual and Magnitude coherence, Phase synchronization, Mutual Information, Coefficient of determination, and Phase-Locking value are developed to assess Functional connectivity. They are applied to different neuroimaging disciplines: functional Magnetic Resonance Imaging (fMRI), Magnetoencephalography (MEG), and Electroencephalography (EEG).

To tackle problems inherent in classical measures – i.e., the assumption of stationarity of Time Series, the time-invariance of Functional connectivity, and the lack of directional information flow between brain units – a methodology for Dynamic Functional Connectivity is also developed.

Radiation Dosimetry in Diagnostic Radiology: A Primer

NEW

SC1185 • Course Level: Introductory • CEU: 0.35
$360 Members • $410 Non-Members USD
Tuesday 1:30 pm to 5:30 pm

Instructor: **Andrew Maidment**

This course provides a foundation of knowledge in radiation dosimetry for scientists and engineers who need to work with dosimetric quantities. Topics to be covered include: a review of the medical uses of ionizing radiation; the basics of radiation biology, including the bioeffects of radiation and radiation injury mechanisms; the concepts of kerma and dose; measurement methods for kerma and dose; the uncertainty of these measurements; application specific dosimetric quantities (such as those for mammography or CT); and methods for reporting dose including DICOM dose structured reports. The course will serve to separate fact from fiction. At the conclusion of the course, attendees should understand the various dosimetric quantities reported with modern medical images.

MIC-GPU: High-Performance Computing for Medical Imaging on Programmable Graphics Hardware (GPU)

SC829 • Course Level: Intermediate • CEU: 0.35
$360 Members • $410 Non-Members USD
Saturday 1:30 pm to 5:30 pm

Instructor: **Klaus Mueller** and **Sungsoo Ha**

Advanced graphics boards have become a standard ingredient in any mid-range and high-end PC, and aside from enabling stunning interactive graphics effects in computer games, their rich programmability allows speedups (over CPU-based code) of 1-2 orders of magnitude also in general-purpose computations. This course explains, in gentle ways, how to exploit this powerful computing platform to accelerate various popular medical imaging applications, such as CT, MRI, image processing, and data visualization. It begins by introducing the basic GPU architecture and its programming model, which establishes a solid understanding on how general computing tasks must be structured and implemented on the GPU to achieve the desired high speedups. Next, it examines a number of standard 2D and 3D medical imaging operators, such as filtering, sampling, statistical analysis, transforms, projectors, etc, and explains how these can be effectively accelerated on the GPU. Finally, it puts this all together by describing the full GPU-accelerated computing pipeline for a representative set of medical imaging applications, such as analytical and iterative CT, MRI, image enhancement chains, and volume visualization.

Spectral CT Imaging

SC987 • Course Level: Intermediate • CEU: 0.35
$360 Members • $410 Non-Members USD
Sunday 8:30 am to 12:30 pm

Instructors: **Bernhard Schmidt, Thomas Flohr,** and **Katharine Grant**

This course provides attendees with an advanced knowledge of spectral CT imaging. The course focuses on the properties of a spectral CT measurement and the main applications in spectral CT reconstruction and spectral CT image post-processing. Many clinical examples of spectral CT imaging applications are provided to illustrate the diagnostic outcome of this technique.

Early Career Professional Development in Medical Imaging

WS757 • Course Level: Introductory • CEU: 0.35
$125 Members | $175 Non-Members USD
Tuesday 1:30 pm to 5:30 pm

Instructor: **Elizabeth Krupinski**

This course provides attendees with strategies and ideas for navigating through the early years of Medical Imaging research in the academic environment. The course focuses on strategic career planning topics such as effective CV development, understanding the Promotion & Tenure process, resource negotiating tips, time management & organizational skills, and writing and winning research grants.

Writing for Publication in Medical Imaging

WS776 • Course Level: Introductory • CEU: 0.35
$125 Members | $175 Non-Members USD
Saturday 1:30 pm to 5:30 pm

Instructor: **Kenneth Hanson**

This course teaches attendees the skills needed to create well-written scientific articles for publication in journals or proceedings. We discuss the structure of a paper and the roles of its various parts. You will learn the principles of good technical writing and how to avoid common pitfalls. We will discuss how to use writer's aids, many of which are available on line.

BRUKER

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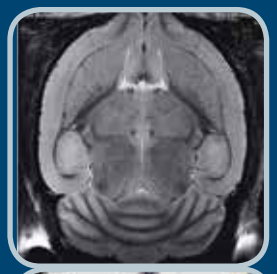
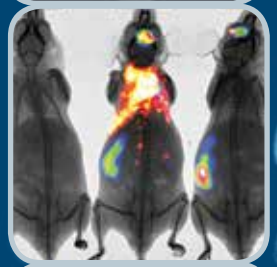


MRI
MPI*



Fluorescence
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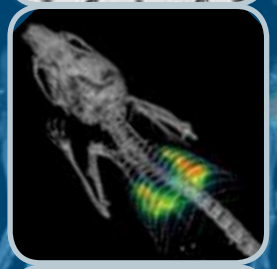
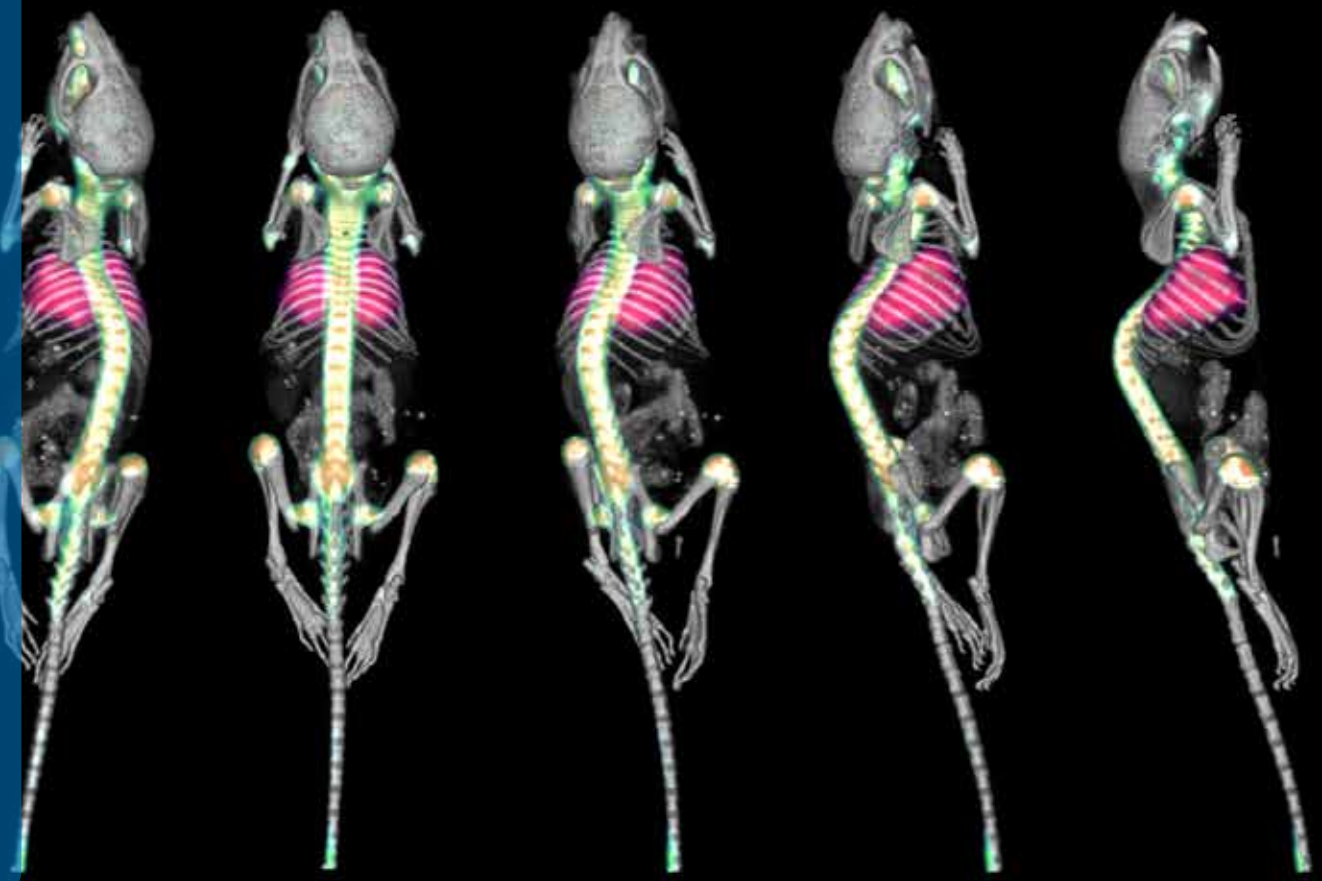
Radioisotopic



PET
SPECT
CT

High Resolution
Micro-CT



www.bruker.com/preclinicalimaging

Photo courtesy of Ken Hanson

POSTER SESSION INFORMATION

Location: Grand Exhibit Hall

Two poster sessions are scheduled. Poster authors will be in attendance during the Interactive Poster Sessions to answer questions. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field.

SUNDAY/MONDAY POSTER SESSION

Poster presentations from the Physics of Medical Imaging; Computer-Aided Diagnosis; Image-guided Procedures, Robotic Interventions, and Modeling; PACS and Imaging Informatics: Next Generation and Innovations; and Ultrasonic Imaging and Tomography conferences will be included.

AUTHOR SET-UP TIME: Sunday after 12:00 pm (noon)

Posters should remain on display until the end of the Interactive Poster Session on Monday.

INTERACTIVE POSTER SESSION AND RECEPTION:
Monday from 5:30 to 7:00 pm

TUESDAY/WEDNESDAY POSTER SESSION

Poster presentations from the Image Processing; Image Perception, Observer Performance, and Technology Assessment; Biomedical Applications in Molecular, Structural, and Functional Imaging; and Digital Pathology conferences will be included.

AUTHOR SET-UP TIME: Tuesday after 9:30 am

Posters should remain on display until the end of the Interactive Poster Session on Wednesday.

INTERACTIVE POSTER SESSION AND RECEPTION:
Wednesday from 5:30 to 7:00 pm

NOTE: Extended poster viewing until 9:00 pm on Sunday and Tuesday.

Poster award winners will be recognized and certificates distributed in the conference meeting rooms. Check conference schedules for times and locations. Ribbons will identify winning posters during the Interactive Poster Sessions.

2016 Poster Awards Information

Location: Poster Awards presented in the Conference Rooms - Check the conference schedule for exact times.

Each conference will recognize selected poster presentations of exceptional quality at either the Cum Laude or Honorable Mention level. Winners will be chosen by members of conference review committees.

The winning posters will be identified during the receptions with award ribbons. Winners will be recognized and certificates distributed in the conference meeting rooms. See conference schedules for times and locations.

In addition, cum laude poster award recipients will be recognized in the Proceedings of SPIE volumes and the following year's Call for Papers.

RECOGNITION LEVELS:
Each conference will recognize a selected poster at the cum laude level for the quality of work presented as well as the presentation. A number of posters, limited to no more than five percent, will receive honorable mention.

BASIS FOR SELECTION:
Work should be of a standard of excellence as judged by the quality and quantity of results presented. It should include results that are both significant and new to the field of study. Conclusions should be well supported by the results, and relevant references should be cited.

Presentation should be well organized, clear, and concise. It should be self-contained, giving adequate background, concise results, and relevant references. Graphic design will be considered only to the extent that it contributes to the clarity of presentation.

A conference may give preference to first authors who are students or who are within five years of their terminal degrees..

MEDICAL IMAGING AWARD EVENTS

2016 Conference Awards

Award announcements will take place in the conference rooms on Tuesday before the morning coffee break.

Image-Guided Procedures Young Scientist Award

(CONFERENCE 9786)

Tuesday 1 March 2016
9:40 to 9:45 am · Location: California

This award is specific to papers in the Image-Guided Procedures, Robotic Interventions, and Modeling conference 9786.

The young scientist award is a prize awarded to first authors of high-quality papers within the Image-Guided Procedures conference.

SPONSORED BY: SIEMENS

Image-Guided Procedures Poster Presentation Awards

(CONFERENCE 9786)

SPONSORED BY NDI

The Image-Guided Procedures, Robotic Interventions, and Modeling conference will offer cash prizes as part of the poster presentation awards. Poster presentations must be displayed early on the first day of the Sunday/Monday poster session to enter the competition. The space will be available to display posters beginning at 12:00 pm on Sunday. Award announcements will take place in the conference room before morning coffee break on Tuesday.

Physics of Medical Imaging Student Paper Award

(CONFERENCE 9783)

Tuesday 1 March 2016
9:40 to 9:45 am · Location: Town & Country

This award is specific to papers in the Physics of Medical Imaging conference 9783.

The student paper award is a prize awarded to first authors of high-quality papers within the Physics of Medical Imaging conference.

SPONSORED BY: Carestream

Physics of Medical Imaging Poster Presentation Awards

(CONFERENCE 9783)

SPONSORED BY: GE Healthcare

The Physics of Medical Imaging conference will offer cash prizes as part of the poster presentation awards. Poster presentations must be displayed early on the first day of the Sunday/Monday poster session to enter the competition. The space will be available to display posters beginning at 12:00 pm on Sunday. Award announcements will take place in the conference room before morning coffee break on Tuesday.

SOCIAL NETWORKING EVENTS

Join your colleagues at these relaxed events, including a Student Lunch with the Experts and Women's Networking Lunch—events not to be missed!

Open to all paid conference attendees.
May require ticket and/or sign-up.

Lunch with the Experts - A Student Networking Event

Sunday 28 February 2016 • 12:10 to 1:20 pm
Location: Grand Exhibit Hall

Open to Student Attendees
Lunch ticket required

Enjoy a casual meal with colleagues at this engaging networking opportunity. Hosted by SPIE Student Services, this event features experts willing to share their experience and wisdom on career paths in optics and photonics. Seating is limited and will be granted on a first-come, first-served basis.

Women's Networking Lunch

Tuesday 1 March • 12:10 to 1:20 pm
Location: Royal Palm Five

Lunch ticket required.

Join other women in the field for informal discussions and networking during the scheduled lunch on Tuesday.

Sign up at registration required before morning coffee break on Tuesday.

Hear the latest advances in Precision Medicine

The SPIE Medical Imaging Precision Medicine track highlights papers that showcase innovative ways to apply this multidimensional / multidisciplinary technology.

PRECISION MEDICINE

An emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person is being highlighted in this year's program. Information regarding the Precision Medicine Initiative is available at: www.whitehouse.gov/precision-medicine.

Sunday 28 February 2016

Cognitive tools pipeline for assistance of mitral valve surgery
Paper 9786-2 • Sunday 28 February 2016 • 8:20 AM
Nicolai J. Schoch, UniversitätsKlinikum Heidelberg (Germany), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION 1: Cardiac Procedures

Random walk based segmentation for the prostate on 3D transrectal ultrasound images
Paper 9786-6 • Sunday 28 February 2016 • 10:10 AM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION 2: Segmentation and 2D and 3D Registration

Patient-tailored multimodal neuroimaging, visualization and quantification of human intra-cerebral hemorrhage
Paper 9789-1 • Sunday 28 February 2016 • 10:10 AM
Andrei Irimia, The Univ. of Southern California (USA), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 1: Imaging Informatics for Precision Medicine

Rayleigh imaging in spectral mammography
Paper 9783-7 • Sunday 28 February 2016 • 10:30 AM
Erik Fredenberg, Philips Healthcare (Sweden), et al.
Conference 9783: Physics of Medical Imaging
SESSION 2: Breast Imaging

Radiogenomic analysis of breast cancer: dynamic contrast enhanced -magnetic resonance imagingbased features are associated with molecular subtypes
Paper 9789-2 • Sunday 28 February 2016 • 10:30 AM
Lihua Li, Hangzhou Dianzi Univ. (China), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 1: Imaging Informatics for Precision Medicine
Date and Time:

Dynamic contrast-enhanced magnetic resonance imaging for prediction of response to neoadjuvant chemotherapy in breast cancer
Paper 9789-3 • Sunday 28 February 2016 • 10:50 AM
Lihua Li, Hangzhou Dianzi Univ. (China), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 1: Imaging Informatics for Precision Medicine
Date and Time:

Medical Sieve: A Cognitive Assistant for Radiologists and Cardiologists
Paper 9785-9 • Sunday 28 February 2016 • 11:10 AM
Tanveer F. Syeda-Mahmood, IBM Research - Almaden (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 2: Musculoskeletal and Miscellaneous

Automatic lung nodule classification with radiomics approach
Paper 9789-4 • Sunday 28 February 2016 • 11:10 AM
Jun Zhao, Shanghai Jiao Tong Univ. (China), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 1: Imaging Informatics for Precision Medicine

Acne image analysis: lesion localization and classification
Paper 9785-10 • Sunday 28 February 2016 • 11:30 AM
Fazly S. Abas, The Ohio State Univ. (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 2: Musculoskeletal and Miscellaneous

3D printed cardiac phantom for procedural planning of a transcatheter native mitral valve replacement
Paper 9789-6 • Sunday 28 February 2016 • 1:40 PM
Richard L. Izzo, The Jacobs Institute (USA), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 2: Surgical PACS, 3D Printing, and Imaging Informatics for Non-radiological Applications

Dictionary-based image denoising for dual-energy computed tomography
Paper 9783-13 • Sunday 28 February 2016 • 2:20 PM
Peter B. Noël, Klinikum rechts der Isar der Technischen Univ. München (Germany), et al.
Conference 9783: Physics of Medical Imaging
Session 3: Keynote and Dual and Multi Energy CT

Monday February 29 2016

Mutual Information-based feature selection for radiomics
Paper 9789-19 • Monday 29 February 2016 • 9:00 AM
Estanislao Oubel, Median Technologies (France), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION 4: Big Data Technologies and Image Sharing in Medical Imaging and Informatics

Increasing cancer detection yield of breast MRI using a new CAD scheme of mammograms
Paper 9785-26 • Monday 29 February 2016 • 10:10 AM
Bin Zheng, The Univ. of Oklahoma (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 6: Radiomics I

Predicting Ki67% expression from DCE-MR images of breast tumors using textural kinetic features in tumor habitats
Paper 9785-28 • Monday 29 February 2016 • 10:50 AM
Baishali Chaudhury, Univ. of South Florida (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 6: Radiomics I

Applying quantitative adiposity feature analysis models to predict benefit of bevacizumab-based chemotherapy in ovarian cancer patients
Paper 9785-29 • Monday 29 February 2016 • 11:10 AM
Bin Zheng, The Univ. of Oklahoma (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 6: Radiomics I

Radiogenomics of glioblastoma: a pilot multi-institutional study to investigate a relationship between tumor shape features and tumor molecular subtype
Paper 9785-30 • Monday 29 February 2016 • 11:30 AM
Kal L. Clark, Duke Univ. (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 6: Radiomics I

Estimation of organ dose under tube current modulated CT for 58 patients across diverse protocols
Paper 9783-120 • Monday 29 February 2016 • 5:30 PM
Wanyi Fu, Duke Univ. (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION PS4: Posters: CT: Technology, System Characterization, Dose, Applications

Calcium scoring with dual-energy CT in men and women: an anthropomorphic phantom study
Paper 9783-148 • Monday 29 February 2016 • 5:30 PM
Nicholas A. Petrick, U.S. Food and Drug Administration (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION PS6: Posters: Dual and Multi Energy CT
Date and Time:

Neutron spectroscopic imaging for precision medical diagnostics
Paper 9783-176 • Monday 29 February 2016 • 5:30 PM
Anuj J. Kapadia, Duke Univ. (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION PS9: Posters: New Systems and Technologies

Validation of coded aperture coherent scatter spectral imaging for normal and neoplastic breast tissues via surgical pathology
Paper 9783-211 • Monday 29 February 2016 • 5:30 PM
Robert E. Morris, Duke Univ. Medical Ctr. (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION PS14: Posters: Scatter and Diffraction Imaging

Synthesized interstitial lung texture for use in anthropomorphic computational phantoms
Paper 9783-216 • Monday 29 February 2016 • 5:30 PM
Marc Becchetti, Duke Univ. (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION PS15: Posters: Task Driven Imaging, Observers, Detectability, Phantom Studies

Quantitative breast MRI radiomics for cancer risk assessment and the monitoring of high-risk populations
Paper 9785-67 • Monday 29 February 2016 • 5:30 PM
Kayla R. Mendel, The Univ. of Chicago (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS1: Posters: Breast

Computer-aided Global Breast MR Image Feature Analysis for Prediction of Tumor Response to Chemotherapy: Performance Assessment
Paper 9785-73 • Monday 29 February 2016 • 5:30 PM
Faranak Aghaei, The Univ. of Oklahoma (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS1: Posters: Breast

Deep learning in the small sample size setting: cascaded feed forward neural networks for medical image segmentation
Paper 9785-89 • Monday 29 February 2016 • 5:30 PM
Bilwaj K. Gaonkar, Univ. of California, Los Angeles (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS3: Posters: Head and Neck

A fully automatic framework for cell segmentation on non-confocal adaptive optics images
Paper 9785-90 • Monday 29 February 2016 • 5:30 PM
Jianfei Liu, National Institutes of Health (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS3: Posters: Head and Neck

Predicting outcomes in glioblastoma patients using computerized analysis of tumor shape: preliminary data
Paper 9785-101 • Monday 29 February 2016 • 5:30 PM
Kal L. Clark, Duke Univ. (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS3: Posters: Head and Neck
Date and Time:

Glioma grading using cell nuclei morphologic features in digital pathology images
Paper 9785-102 • Monday 29 February 2016 • 5:30 PM
Khan M. Iftekharuddin, Old Dominion Univ. (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS3: Posters: Head and Neck

Change descriptors for determining nodule malignancy in National Lung Screening Trial CT screening images
Paper 9785-113 • Monday 29 February 2016 • 5:30 PM
Benjamin E. Geiger, Univ. of South Florida (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION PS4: Posters: Lung and Chest

Visual design and verification tool for collision-free dexterous patient specific neurosurgical instruments
Paper 9786-57 • Monday 29 February 2016 • 5:30 PM
Margaret A. Hess, Lab. for Percutaneous Surgery (Canada), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION PSMon: Poster-Sunday/Monday
Date and Time:

Kinect based real-time position calibration for nasal endoscopic surgical navigation system
Paper 9786-59 • Monday 29 February 2016 • 5:30 PM
Jian Yang, Beijing Institute of Technology (China), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION PSMon: Poster-Sunday/Monday

A motorized ultrasound system for MRI-ultrasound fusion guided prostatectomy
Paper 9786-88 • Monday 29 February 2016 • 5:30 PM
Reza Seifabadi, National Institutes of Health (USA), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION PSMon: Poster-Sunday/Monday

Interactive visualization for scar transmurality in cardiac resynchronization therapy
Paper 9786-100 • Monday 29 February 2016 • 5:30 PM
Sabrina Reiml, Siemens Healthcare (Germany), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION PSMon: Poster-Sunday/Monday

Semantic information extracting system for classification of radiological reports in radiology information system (RIS)
Paper 9789-26 • Monday 29 February 2016 • 5:30 PM
Liehang Shi, Shanghai Institute of Technical Physics (China), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION PSMon: Sunday/Monday Posters

Building hybrid high-dimensional imaging database for content-based image search
Paper 9789-28 • Monday 29 February 2016 • 5:30 PM
Qinpei Sun, Shanghai Institute of Technical Physics (China), et al.
Conference 9789: PACS and Imaging Informatics: Next Generation and Innovations
SESSION PSMon: Sunday/Monday Posters

Determining cardiac fiber orientation using FSL and registered ultrasound/DTI volumes
Paper 9790-40 • Monday 29 February 2016 • 5:30 PM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9790: Ultrasonic Imaging and Tomography
SESSION PS1: Poster SESSION: Motion and Deformation Imaging

Observations of liver cancer cells in scanning probe acoustic microscope: a preliminary study
Paper 9790-65 • Monday 29 February 2016 • 5:30 PM
Xiaohui Chen, Huazhong Univ. of Science and Technology (China), et al.
Conference 9790: Ultrasonic Imaging and Tomography
SESSION PS7: Poster SESSION: Transducers and Beamforming

Tuesday 1 March 2016

A computational model for estimating tumor margins in complementary tactile and 3D ultrasound images
Paper 9786-41 • Tuesday 1 March 2016 • 9:00 AM
Arefin M. Shamsil, Canadian Surgical Technologies and Advanced Robotics (Canada), et al.
Conference 9786: Image-Guided Procedures, Robotic Interventions, and Modeling
SESSION 8: Intraoperative Imaging and Visualization

An open library of CT patient projection data
Paper 9783-44 • Tuesday 1 March 2016 • 10:10 AM
Baiyu Chen, Mayo Clinic (USA), et al.
Conference 9783: Physics of Medical Imaging
SESSION 9: CT II: Image Reconstruction, Artifact Reduction

Computer-aided detection of human cone photoreceptor inner segments using multi-scale circular voting
Paper 9785-45 • Tuesday 1 March 2016 • 10:50 AM
Jianfei Liu, National Institutes of Health (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 9: Head and Neck
Date and Time:

Applying a radiomics approach to predict prognosis of lung cancer patients
Paper 9785-49 • Tuesday 1 March 2016 • 1:20 PM
Bin Zheng, The Univ. of Oklahoma (USA), et al.
Conference 9785: Computer-Aided Diagnosis
SESSION 10: Radiomics II

Spatiotemporal-atlas-based dynamic speech imaging
Paper 9788-3 • Tuesday 1 March 2016 • 2:00 PM
Maojing Fu, Univ. of Illinois at Urbana-Champaign (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 1: Novel Imaging Methods

Performance modeling of a wearable Brain PET (BET) camera
Paper 9788-5 • Tuesday 1 March 2016 • 2:40 PM
Andrzej Krol, SUNY Upstate Medical Univ. (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 1: Novel Imaging Methods

Wednesday 2 March 2016

Discriminatory power of common genetic variants in personalized breast cancer diagnosis
Paper 9787-24 • Wednesday 2 March 2016 • 9:20 AM
Yirong Wu, Univ. of Wisconsin-Madison (USA), et al.
Conference 9787: Image Perception, Observer Performance, and Technology Assessment
SESSION 1: Technology Assessment in Breast Imaging

Evaluating effects of methylphenidate on brain activity in cocaine addiction: a machine-learning approach
Paper 9788-23 • Wednesday 2 March 2016 • 2:40 PM
Irina Rish, IBM Thomas J. Watson Research Ctr. (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 5: fMRI

Slide specific models for segmentation of differently stained digital histopathology whole slide images
Paper 9784-35 • Wednesday 2 March 2016 • 3:30 PM
Nicolas Brieu, Definiens AG (Germany), et al.
Conference 9784: Image Processing
SESSION 8: Machine Learning

Intraoperative neuropathology of glioma recurrence: cell detection and classification
Paper 9791-8 • Wednesday 2 March 2016 • 4:50 PM
Fazly S. Abas, The Ohio State Univ. (USA), et al.
Conference 9791: Digital Pathology
SESSION 2: Precision Medicine and Grading

Image similarity ranking of focal computed tomography liver lesions using a 2AFC technique
Paper 9787-20 • Wednesday 2 March 2016 • 5:10 PM
Jessica Faruque, National Institutes of Health (USA), et al.
Conference 9787: Image Perception, Observer Performance, and Technology Assessment
SESSION 4: Perception

Capturing population based patient-specific characters for prostate segmentation on 3D CT images
Paper 9784-78 • Wednesday 2 March 2016 • 5:30 PM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9784: Image Processing
SESSION PS1: Posters: Classification and Machine Learning

A framework for probabilistic atlas-based organ segmentation
Paper 9784-104 • Wednesday 2 March 2016 • 5:30 PM
Chunhua Dong, Ritsumeikan Univ. (Japan), et al.
Conference 9784: Image Processing
SESSION PS2: Posters: Segmentation

A utility/cost analysis of breast cancer risk prediction algorithms
Paper 9787-55 • Wednesday 2 March 2016 • 5:30 PM
Craig K. Abbey, Univ. of California, Santa Barbara (USA), et al.
Conference 9787: Image Perception, Observer Performance, and Technology Assessment
SESSION PWed: Posters-Tuesday/Wednesday

Transcranial direct current stimulation transiently increases the blood-brain barrier solute permeability in vivo
Paper 9788-68 • Wednesday 2 March 2016 • 5:30 PM
Bingmei Fu, The City College of New York (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION PS4: Posters: Neurological Imaging

Respiratory-gated electrical impedance tomography: a potential technique for quantifying stroke volume
Paper 9788-84 • Wednesday 2 March 2016 • 5:30 PM
Saaid H. Arshad, Thayer School of Engineering at Dartmouth (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION PS7: Posters: Fluids and Cardiovascular

Nonrigid 2D registration of fluoroscopic coronary artery image sequence with layered motion
Paper 9788-87 • Wednesday 2 March 2016 • 5:30 PM
Taewoo Park, Hankuk Univ. of Foreign Studies (Korea, Republic of), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION PS7: Posters: Fluids and Cardiovascular

Deciphering protein signatures using color, morphological, and topological analysis of immunohistochemically stained human tissues
Paper 9791-27 • Wednesday 2 March 2016 • 5:30 PM
Maria Gabrani, IBM Research - Zürich (Switzerland), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Pathological Gleason prediction through gland ring morphometry in immunofluorescent prostate cancer images
Paper 9791-29 • Wednesday 2 March 2016 • 5:30 PM
Faisal Khan, Rutgers, The State Univ. of New Jersey (USA), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Automatic extraction of a novel imaging biomarker from fluorescence microscopic imaging of TRA-8/DR5 oligomers to predict TRA-8 therapeutic efficacy in breast and pancreatic cancer mouse models
Paper 9791-33 • Wednesday 2 March 2016 • 5:30 PM
Hyunki Kim, The Univ. of Alabama at Birmingham (USA), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Identification of immune cell infiltration in hematoxylin-eosin stained breast cancer samples: Texture-based classification of tissue morphologies
Paper 9791-34 • Wednesday 2 March 2016 • 5:30 PM
Riku Turkki, Univ. of Helsinki (Finland), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Deep learning-based gland quantification in digitized tissue samples from patients with colorectal cancer: associations with clinical data and outcome
Paper 9791-39 • Wednesday 2 March 2016 • 5:30 PM
Dmitrii Bychkov, Univ. of Helsinki (Finland), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Hierarchical nucleus segmentation in digital pathology images
Paper 9791-41 • Wednesday 2 March 2016 • 5:30 PM
Yi Gao, Stony Brook Univ. (USA), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

The role of imaging based prostate biopsy morphology in a data fusion paradigm for transducing prognostic predictions
Paper 9791-43 • Wednesday 2 March 2016 • 5:30 PM
Faisal Khan, Rutgers, The State Univ. of New Jersey (USA), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Toward phenotypic analysis of whole zebrafish from synchrotron microCT images: Automated detection and segmentation of cell nuclei
Paper 9791-44 • Wednesday 2 March 2016 • 5:30 PM
Yifu Ding, Penn State College of Medicine (USA), et al.
Conference 9791: Digital Pathology
SESSION PSWed: Posters-Tuesday/Wednesday

Thursday 3 March 2016

A dual energy CT study on vascular effects of gold nanoparticles in radiation therapy
Paper 9788-31 • Thursday 3 March 2016 • 8:20 AM
Cristian T. Badea, Duke Univ. (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 7: Fluids and Cardiovascular

Adaptive local thresholding for robust nucleus segmentation utilizing shape priors
Paper 9791-11 • Thursday 3 March 2016 • 8:20 AM
Shawn Wang, Ventana Medical Systems, Inc. (USA), et al.
Conference 9791: Digital Pathology
SESSION 3: Detection and Segmentation

Non-uniform object counting method in large-format pyramid images applied to CD31 vessel counting in whole-mount digital pathology sections
Paper 9791-12 • Thursday 3 March 2016 • 8:40 AM
Mayan Murray, Sunnybrook Research Institute (Canada), et al.
Conference 9791: Digital Pathology
SESSION 3: Detection and Segmentation

Multimodal in vivo imaging of tumor xenografts using novel receptor-targeted peptide tracers
Paper 9788-35 • Thursday 3 March 2016 • 10:10 AM
Sarah Erdmann, Charité Universitätsmedizin Berlin (Germany), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 8: Cancer Imaging

Predicting response before initiation of neoadjuvant chemotherapy in breast cancer using new methods for the analysis of dynamic contrast enhanced MRI (DCE MRI) data
Paper 9788-36 • Thursday 3 March 2016 • 10:30 AM
Julio Cárdenas-Rodríguez, The Univ. of Arizona (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 8: Cancer Imaging

Hyperspectral imaging of neoplastic progression in a mouse model of oral carcinogenesis
Paper 9788-37 • Thursday 3 March 2016 • 10:50 AM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 8: Cancer Imaging

Optimal retinal cyst segmentation from OCT images
Paper 9784-49 • Thursday 3 March 2016 • 11:10 AM
Ipek Oguz, The Univ. of Iowa (USA), et al.
Conference 9784: Image Processing
SESSION 10: Segmentation

Superpixel-based spectral classification for the detection of head and neck cancer with hyperspectral imaging
Paper 9788-38 • Thursday 3 March 2016 • 11:10 AM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 8: Cancer Imaging

Evaluation of 6-([18F] fluoroacetamido)-1-hexanoic-anilide (18F-FAHA) as imaging probe in tumor xenograft mice model
Paper 9788-39 • Thursday 3 March 2016 • 11:30 AM
Author(s): Fiona Li, Western Univ. (Canada), et al.
Conference 9788: Biomedical Applications in Molecular, Structural, and Functional Imaging
SESSION 8: Cancer Imaging

Quantitative diagnosis of tongue cancer from histological images in an animal model
Paper 9791-20 • Thursday 3 March 2016 • 11:50 AM
Baowei Fei, Emory Univ. (USA), et al.
Conference 9791: Digital Pathology
SESSION 4: Machine Learning
Date and Time:

Multi-scale learning based segmentation of glands in digital colonrectal pathology images
Paper 9791-21 • Thursday 3 March 2016 • 1:20 PM
Yi Gao, Stony Brook Univ. (USA), et al.
Conference 9791: Digital Pathology
SESSION 5: Emerging Technologies

TECHNICAL CONFERENCES

CONFERENCE 9783

Room: Town & Country

Sun.–Wed. 28 Feb.–2 March 2016
Proceedings of SPIE Vol. 9783

Physics of Medical Imaging

Conference Chairs: **Despina Kontos,** The Univ. of Pennsylvania Health System (USA); **Thomas G. Flohr,** Siemens Healthcare GmbH (Germany)

Conference Co-Chair: **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA)

Program Committee: **Andreu Badal,** U.S. Food and Drug Administration (USA); **Kirsten Boedeker,** Toshiba Medical Research Institute USA (USA); **Hilde Bosmans,** Katholieke Univ. Leuven (Belgium); **Guang-Hong Chen,** Univ. of Wisconsin-Madison (USA); **Mini Das,** Univ. of Houston (USA); **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden); **Maria Drangova,** Robarts Research Institute (Canada); **Rebecca Fahrig,** Siemens Healthcare GmbH (Germany), Stanford Univ. School of Medicine (USA); **Taly Gilat-Schmidt,** Marquette Univ. (USA); **Stephen J. Glick,** U.S. Food and Drug Administration (USA), Univ. of Massachusetts Medical School (USA); **Michael Grass,** Philips Research (Germany); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany); **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Karim S. Karim,** Univ. of Waterloo (Canada); **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Jinyi Qi,** Univ. of California, Davis (USA); **Magdalena Rafecas,** Univ. zu Lübeck (Germany); **Ingrid S. Reiser,** The Univ. of Chicago (USA); **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada); **John M. Sabol,** GE Healthcare (USA); **Joseph W. Stayman,** Johns Hopkins Univ. (USA); **Anders Tingberg,** Lund Univ. (Sweden); **John Yorkston,** Carestream Health, Inc. (USA); **Wei Zhao,** Stony Brook Medicine (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Tuesday morning.

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CONFERENCE 9784

Room: San Diego

Tues.–Thurs. 1–3 March 2016
Proceedings of SPIE Vol. 9784

Image Processing

Conference Chairs: **Martin A. Styner,** The Univ. of North Carolina at Chapel Hill (USA); **Elsa D. Angelini,** Columbia Univ. (USA), Télécom ParisTech (France)

Program Committee: **Rafeef Abugharbieh,** The Univ. of British Columbia (Canada); **Paul Aljabar,** King's College London (UK); **Mostafa Analoui,** Livingston Securities, LLC (USA); **Brian B. Avants,** Univ. of Pennsylvania (USA); **Meritxell Bach-Cuadra,** Univ. de Lausanne (Switzerland); **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr. (USA); **Christian Barillot,** IRISA / INRIA Rennes (France); **Benoit M. Dawant,** Vanderbilt Univ. (USA); **Marleen de Bruijne,** Erasmus MC (Netherlands); **Alexandre X. Falcão,** Univ. Estadual de Campinas (Brazil); **Baowei Fei,** Emory Univ. (USA); **Aaron Fenster,** Robarts Research Institute (Canada); **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Mona K. Garvin,** The Univ. of Iowa (USA); **James C. Gee,** Univ. of Pennsylvania (USA); **Guido Gerig,** The Univ. of Utah (USA); **Benjamin Glocker,** Imperial College London (UK); **Miguel Angel González Ballester,** Univ. Pompeu Fabra (Spain); **Hayit Greenspan,** Tel Aviv Univ. (Israel); **Ghassan Hamarneh,** Simon Fraser Univ. (Canada); **David R. Haynor,** Univ. of Washington (USA); **Tobias Heimann,** Siemens AG (Germany); **Ivana Išgum,** Univ. Medical Ctr. Utrecht (Netherlands); **Stefan Klein,** Erasmus MC (Netherlands); **Bennett A. Landman,** Vanderbilt Univ. (USA); **Tianhu Lei,** MD Imaging Research (USA); **Boudewijn P. F. Lelieveldt,** Leiden Univ. Medical Ctr. (Netherlands); **Marius George Linguraru,** Children's National Medical Ctr. (USA); **Murray H. Loew,** The George Washington Univ. (USA); **Cristian Lorenz,** Philips Research (Germany); **Frederik Maes,** Katholieke Univ. Leuven (Belgium); **Diana Mateus,** Technische Univ. München (Germany); **Vincent A. Magnotta,** The Univ. of Iowa Hospitals and Clinics (USA); **Sunanda D. Mitra,** Texas Tech Univ. (USA); **Kensaku Mori,** Nagoya Univ. (Japan); **Nassir Navab,** Technische Univ. München (Germany), Johns Hopkins Univ. (USA); **Mads Nielsen,** Niels Bohr Institute (Denmark); **Wiro J. Niessen,** Erasmus MC (Netherlands); **Brian Nutter,** Texas Tech Univ. (USA); **Sébastien Ourselin,** Univ. College London (UK); **Dzung L. Pham,** Henry Jackson Foundation/USU (USA), National Institutes of Health (USA), Johns Hopkins Univ. (USA); **Jerry L. Prince,** Johns Hopkins Univ. (USA); **Sonia Pujol,** Brigham and Women's Hospital (USA); **Punam K. Saha,** The Univ. of Iowa (USA); **Olivier Salvado,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Lin Shi,** The Chinese Univ. of Hong Kong (China); **Marius Staring,** Leiden Univ. Medical Ctr. (Netherlands); **Philippe Thevenaz,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Jayaram K. Udupa,** Univ. of Pennsylvania (USA); **Koen Van Leemput,** Harvard Medical School (USA), Massachusetts General Hospital (USA); **Tom K. Vercauteren,** Univ. College London (UK); **Tomaž Vrtovec,** Univ. of Ljubljana (Slovenia); **Wolfgang Wein,** ImFusion GmbH (Germany)

Posters for this conference will be on display Tuesday and Wednesday in Grand Exhibit Hall. The interactive poster session with authors in attendance will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Thursday morning.

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CONFERENCE 9785

Room: Golden West

Sun.–Wed. 28 Feb.–2 March 2016
Proceedings of SPIE Vol. 9785

Computer-Aided Diagnosis

Conference Chairs: **Georgia D. Tourassi,** Oak Ridge National Lab. (USA); **Samuel G. Armato III,** The Univ. of Chicago (USA)

Program Committee: **Susan M. Astley,** The Univ. of Manchester (UK); **Stephen Aylward,** Kitware, Inc. (USA); **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr. (USA); **Matthew S. Brown,** Univ. of California, Los Angeles (USA); **Heang-Ping Chan,** Univ. of Michigan Health System (USA); **Marleen de Bruijne,** Erasmus MC (Netherlands); **Thomas M. Deserno,** RWTH Aachen (Germany); **Karen Drukker,** The Univ. of Chicago (USA); **Catalin Fetita,** Télécom SudParis (France); **Hiroshi Fujita,** Gifu Univ. School of Medicine (Japan); **Maryellen L. Giger,** The Univ. of Chicago (USA); **Hayit Greenspan,** Tel Aviv Univ. (Israel); **Lubomir M. Hadjiiski,** Univ. of Michigan Health System (USA); **Horst Karl Hahn,** Fraunhofer MEVIS (Germany); **Khan M. Iftekharuddin,** Old Dominion Univ. (USA); **Nico Karssemeijer,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **JongHyo Kim,** Seoul National Univ. Hospital (Korea, Republic of); **Marius George Linguraru,** Children's National Medical Ctr. (USA); **Fabrice Meriaudeau,** Univ. de Bourgogne (France); **Kensaku Mori,** Nagoya Univ. (Japan); **Janne J. Näppi,** Massachusetts General Hospital (USA); **Noboru Niki,** Univ. of Tokushima (Japan); **Carol L. Novak,** Siemens Corp., Corporate Technology (USA); **Nicholas A. Petrick,** U.S. Food and Drug Administration (USA); **Clarisa I. Sánchez,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Ronald M. Summers,** National Institutes of Health (USA); **Kenji Suzuki,** Illinois Institute of Technology (USA); **Bram van Ginneken,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Eva M. van Rikxoort,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Rafael Wiemker,** Philips Research (Germany); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA); **Xiaofeng Yang,** Emory Univ. (USA); **Hiroyuki Yoshida,** Massachusetts General Hospital (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Tuesday morning.

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CONFERENCE 9786

Room: California

Sun.–Tues. 28 Feb.–1 March 2016
Proceedings of SPIE Vol. 9786

Image-Guided Procedures, Robotic Interventions, and Modeling

Conference Chairs: **Robert J. Webster III,** Vanderbilt Univ. (USA); **Ziv R. Yaniv,** National Library of Medicine (USA)

Program Committee: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Wolfgang Birkfellner,** Medizinische Univ. Wien (Austria); **Sandrine de Ribaupierre,** Western Univ. (Canada); **Baowei Fei,** Emory Univ. (USA); **Gabor Fichtinger,** Queen's Univ. (Canada); **George J. Grevera,** Saint Joseph's Univ. (USA); **David Hawkes,** Univ. College London (UK); **David R. Haynor,** Univ. of Washington (USA); **William E. Higgins,** The Pennsylvania State Univ. (USA); **David R. Holmes III,** Mayo Clinic (USA); **Pierre Jannin,** Univ. de Rennes 1 (France); **David M. Kwartowitz,** Clemson Univ. (USA); **Cristian A. Linte,** Rochester Institute of Technology (USA); **Lena Maier-Hein,** Deutsches Krebsforschungszentrum (Germany); **Michael I. Miga,** Vanderbilt Univ. (USA); **Kensaku Mori,** Nagoya Univ. (Japan); **Parvin Mousavi,** Queen's Univ. (Canada); **Maryam E. Rettmann,** Mayo Clinic (USA); **Frank Sauer,** Siemens Corp., Corporate Technology (USA); **Eric J. Seibel,** Univ. of Washington (USA); **Guy Shechter,** Philips Healthcare (USA); **Amber L. Simpson,** Memorial Sloan-Kettering Cancer Ctr. (USA); **Stefanie Speidel,** Karlsruher Institut für Technologie (Germany); **Andrew D. Wiles,** Northern Digital Inc. (Canada); **Ivo Wolf,** Hochschule Mannheim (Germany)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Tuesday morning.

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CONFERENCE 9787

Room: California

Wed.–Thurs. 2–3 March 2016
Proceedings of SPIE Vol. 9787

Image Perception, Observer Performance, and Technology Assessment

Conference Chairs: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA); **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (USA)

Program Committee: **François O. Bochud,** Ctr. Hospitalier Univ. Vaudois (Switzerland); **Jovan G. Brankov,** Illinois Institute of Technology (USA); **Alastair G. Gale,** Loughborough Univ. (UK); **Howard C. Gifford,** Univ. of Houston (USA); **Stephen L. Hillis,** The Univ. of Iowa (USA); **Elizabeth A. Krupinski,** The Univ. of Arizona (USA); **Maciej A. Mazurowski,** Duke Univ. (USA); **Anthony J. Maeder,** The Univ. of Western Australia (Australia); **Mark F. McEntee,** The Univ. of Sydney (Australia); **Claudia R. Mello-Thoms,** The Univ. of Sydney (Australia), Univ. of Pittsburgh (USA); **Robert M. Nishikawa,** Univ. of Pittsburgh (USA); **Subok Park,** U.S. Food and Drug Administration (USA); **Ljiljana Platiša,** Univ. Gent (Belgium); **Frank W. Samuelson,** U.S. Food and Drug Administration (USA); **Sian Taylor-Phillips,** The Univ. of Warwick (UK); **Pontus A. Timberg,** Scanias Univ. Hospital (Sweden); **David L. Wilson,** Case Western Reserve Univ. (USA)

Posters for this conference will be on display Tuesday and Wednesday in Grand Exhibit Hall. The interactive poster session with authors in attendance will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Thursday morning.

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TECHNICAL CONFERENCES

CONFERENCE 9788

Room: Royal Palm One

Tues.–Thurs. 1–3 March 2016
Proceedings of SPIE Vol. 9788

Biomedical Applications in Molecular, Structural, and Functional Imaging

Conference Chairs: **Barjor Gimi,** Geisel School of Medicine at Dartmouth (USA); **Andrzej Krol,** SUNY Upstate Medical Univ. (USA)

Program Committee: **David Abookasis,** Ariel Univ. (Israel); **Amir A. Amini,** Univ. of Louisville (USA); **Juan R. Cebral,** George Mason Univ. (USA); **Anne V. Clough,** Marquette Univ. (USA); **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Xavier Intes,** Rensselaer Polytechnic Institute (USA); **Vikram Kodibagkar,** Arizona State Univ. (USA); **Changqing Li,** Univ. of California, Merced (USA); **Armando Manduca,** Mayo Clinic College of Medicine (USA); **Robert C. Molthen,** GE Healthcare (USA), Marquette Univ. (USA), Medical College of Wisconsin (USA); **Nicholas J. Tustison,** Univ. of Virginia (USA); **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA); **Baohong Yuan,** The Univ. of Texas at Arlington (USA)

Posters for this conference will be on display Tuesday and Wednesday in Grand Exhibit Hall. The interactive poster session with authors in attendance will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Thursday afternoon.

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CONFERENCE 9789

Room: San Diego

Sun.–Mon. 28–29 Feb. 2019
Proceedings of SPIE Vol. 9789

PACS and Imaging Informatics: Next Generation and Innovations

Conference Chairs: **Jianguo Zhang,** Shanghai Institute of Technical Physics (China); **Tessa S. Cook,** The Univ. of Pennsylvania Health System (USA)

Program Committee: **Peter R. Bak,** McMaster Univ. (Canada); **William W. Boonn,** The Univ. of Pennsylvania Health System (USA); **Thomas M. Deserno,** RWTH Aachen (Germany); **Steven C. Horii,** The Univ. of Pennsylvania Health System (USA); **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China); **Heinz U. Lemke,** Computer Assisted Radiology and Surgery (Germany); **Brent J. Liu,** The Univ. of Southern California (USA); **Eliot L. Siegel,** Univ. of Maryland Medical Ctr. (USA); **Wyatt Tellis,** Univ. of California, San Francisco (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Monday mrning.

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CONFERENCE 9790

Room: Royal Palm One

Sun.–Mon. 28–29 Feb. 2016
Proceedings of SPIE Vol. 9790

Ultrasonic Imaging and Tomography

Conference Chairs: **Neb Duric,** Delphinus Medical Technologies (USA), Barbara Ann Karmanos Cancer Institute (USA); **Brecht Heyde,** Univ. of Leuven (Belgium), Duke Univ. (USA)

Program Committee: **Mark A. Anastasio,** Washington Univ. in St. Louis (USA); **Jeffrey C. Bamber,** The Royal Marsden NHS Foundation Trust (UK); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands); **Jan D'hooge,** Univ. of Leuven (Belgium); **Marvin M. Doyley,** Univ. of Rochester (USA); **Stanislav Y. Emelianov,** The Univ. of Texas at Austin (USA); **Mostafa Fatemi,** Mayo Clinic College of Medicine (USA); **Aaron Fenster,** Robarts Research Institute (Canada); **Jérémie Fromageau,** The Institute of Cancer Research (UK); **James F. Greenleaf,** Mayo Clinic (USA); **Emma J. Harris,** The Institute of Cancer Research (UK); **Martin Christian Hemmsen,** Technical Univ. of Denmark (Denmark); **Michael Jaeger,** Univ. Bern (Switzerland); **Jørgen Arendt Jensen,** Technical Univ. of Denmark (Denmark); **Hyung Ham Kim,** Univ. of Southern California (USA); **Roman G. Maev,** Univ. of Windsor (Canada); **Stephen A. McAleavey,** Univ. of Rochester (USA); **Mohammad Mehrmohammadi,** Wayne State Univ. (USA); **Serge Mensah,** Aix-Marseille Univ. (France); **Svetoslav I. Nikolov,** BK Medical (Denmark); **Olivier Roy,** Karmanos Cancer Institute (USA); **Nicole V. Ruiter,** Karlsruher Institut für Technologie (Germany); **Kai E. Thomenius,** Massachusetts Institute of Technology (USA); **William F. Walker,** Univ. of Virginia (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Monday afternoon.

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CONFERENCE 9791

Room: Golden West

Wed.–Thurs. 2–3 March 2016
Proceedings of SPIE Vol. 9791

Digital Pathology

Conference Chairs: **Metin N. Gurcan,** The Ohio State Univ. Wexner Medical Ctr. (USA); **Anant Madabhushi,** Case Western Reserve Univ. (USA)

Program Committee: **Selim Aksoy,** Bilkent Univ. (Turkey); **Ulysses J. Balis,** Univ. of Michigan Health System (USA); **Rohit Bhargava,** Univ. of Illinois at Urbana-Champaign (USA); **Ulf-Dietrich Braumann,** Hochschule für Technik, Wirtschaft und Kultur Leipzig (Germany); **Eric Cosatto,** NEC Labs. America, Inc. (USA); **Scott Doyle,** Rutgers, The State Univ. of New Jersey (USA); **Michael D. Feldman,** The Univ. of Pennsylvania Health System (USA); **David J. Foran,** Rutgers Cancer Institute of New Jersey (USA); **Brandon D. Gallas,** U.S. Food and Drug Administration (USA); **Marios A. Gavrielides,** U.S. Food and Drug Administration (USA); **Tom R. L. Kimpe,** Barco N.V. (Belgium); **Elizabeth A. Krupinski,** The Univ. of Arizona (USA); **Richard M. Levenson,** Univ. of California, Davis (USA); **Olivier Lezoray,** Univ. de Caen Basse-Normandie (France); **Derek R. Magee,** Univ. of Leeds (UK); **Anne L. Martel,** Sunnybrook Research Institute (Canada); **Erik Meijering,** Erasmus MC (Netherlands); **James P. Monaco,** Inspirata, Inc. (USA); **Mehdi Moradi,** IBM Research - Almaden (USA); **Bahram Parvin,** Lawrence Berkeley National Lab. (USA); **Josien P. W. Pluim,** Image Sciences Institute (Netherlands); **Nasir M. Rajpoot,** Qatar Univ. (Qatar); **Gustavo Kunde Rohde,** Carnegie Mellon Univ. (USA); **Berkman Sahiner,** U.S. Food and Drug Administration (USA); **Chukka Srinivas,** Ventana Medical Systems, Inc. (USA); **John E. Tomaszewski,** Univ. at Buffalo (USA); **Darren Treanor,** Univ. of Leeds (UK); **Jeroen van der Laak,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Aaron D. Ward,** The Univ. of Western Ontario (Canada); **Martin J. Yaffe,** Sunnybrook Research Institute (Canada); **Bülent Yener,** Rensselaer Polytechnic Institute (USA)

Posters for this conference will be on display Tuesday and Wednesday in Grand Exhibit Hall. The interactive poster session with authors in attendance will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Thursday morning.

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SUNDAY 28 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 1
Room: Town & Country . .Sun 8:00 to 9:40 am

Tomosynthesis and Digital Subtraction Angiography
Session Chairs: **Joseph Y. Lo,** Duke Univ. (USA);
John M. Sabol, GE Healthcare (USA)

8:00 am: **Quantification of resolution in multiplanar reconstructions for digital breast tomosynthesis**, Trevor L. Vent, Raymond J. Acciavatti, Young Joon Kwon, Andrew D. A. Maidment, Univ. of Pennsylvania (USA) . . . . . [9783-1]

8:20 am: **Tomosynthesis for coronary artery calcium scoring**, Gongting Wu, Jiong Wang, Marci Potuzko, Allison Harman, Caleb Pearce, Jing Shan, Yueh Z. Lee M.D., Otto Zhou, Jianping Lu, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9783-2]

8:40 am: **A new generation of stationary digital breast tomosynthesis system with wider angular span and faster scanning time**, Jabari Calliste, The Univ. of North Carolina at Chapel Hill (USA); Bo Gao, Philip E. Laganis, Derrek Spronk, Houman Jafari, Kyle Olson, XinRay Systems Inc. (USA); Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9783-3]

9:00 am: **Detection of microcalcification clusters by 2D-mammography and narrow and wide angle digital breast tomosynthesis**, Andria Hadjipanteli, The Royal Surrey County Hospital NHS Trust (UK); Premkumar Elangovan, Ctr. for Vision Speech and Signal Processing, Univ. of Surrey (UK); Padraig T. Looney, Alistair Mackenzie, The Royal Surrey County Hospital NHS Trust (UK); Kevin Wells, Ctr. for Vision, Speech and Signal Processing, Univ. of Surrey (UK); David R. Dance, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) . .[9783-4]

9:20 am: **Feasibility of reduced-dose 3D/4D-DSA using a weighted edge preserving filter**, Erick L. Oberstar, Michael A. Speidel, Brian J. Davis, Charles M. Strother, Charles A. Mistretta, Univ. of Wisconsin-Madison (USA) . . . . . .[9783-5]

Coffee Break. . . . Sun 9:40 am to 10:10 am

9783 continues on page 29

CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 1
Room: Golden West . . . . Sun 8:00 to 9:40 am

Vessels and Heart
Session Chairs: **Stephen Aylward,** Kitware, Inc. (USA); **Thomas Deserno,** Uniklinik RWTH Aachen (Germany)

8:00 am: **Inner and outer coronary vessel wall segmentation from CCTA using an active contour model with machine learning-based 3D voxel context-aware image force**, Udhayaraj Sivalingam, Technische Univ. München (Germany) and Siemens Healthcare GmbH (Germany); Michael G. Wels, Siemens Healthcare GmbH (Germany); Markus Rempfler, Technische Univ. München (Germany); Stefan Grosskopf, Michael Suehling, Siemens Healthcare GmbH (Germany); Bjoern H. Menze, Technische Univ. München (Germany) . . . . . [9785-1]

8:20 am: **Automated identification of best-quality coronary artery segments from multiple-phase coronary CT angiography (cCTA) for vessel analysis**, Chuan Zhou, Heang-Ping Chan, Lubomir M. Hadjiiski, Aamer R. Chughtai, Jun Wei, Ella A. Kazerooni M.D., Univ. of Michigan Health System (USA) . . . . . .[9785-2]

8:40 am: **3D assessment of the carotid artery vessel wall volume: an imaging biomarker for diagnosis of the Atherosclerotic Disease**, Mariam Afshin, Tishan Maraj, Tina Bineshmarvasti, Navneet Singh, Sunnybrook Health Sciences Ctr. (Canada); Alan Moody, Univ. of Toronto (Canada) . . . . . .[9785-3]

9:00 am: **A system for automatic aorta sections measurements on chest CT**, Yitzchak Pfeffer, RADLogics Inc. (Israel); Arnaldo Mayer, The Chaim Sheba Medical Ctr., Tel Hashomer (Israel); Adi Zholkover, RADLogics Inc. (Israel); Eli Konen M.D., The Chaim Sheba Medical Ctr., Tel Hashomer (Israel) . . . . . .[9785-4]

9:20 am: **Quantitative MRI myocarditis analysis by a PCA- based object recognition algorithm**, Rocco Romano, Univ. degli Studi di Salerno (Italy); Igino De Giorgi, Azienda Ospedaliera Univ. (Italy); Fausto Acernese, Gerardo Giordano, Univ. degli Studi di Salerno (Italy); Antonio Orientale, Giovanni Babino, Azienda Ospedaliera Univ. San Giovanni di Dio e Ruggi D'Aragona (Italy); Fabrizio Barone, Univ. degli Studi di Salerno (Italy) .[9785-5]

Coffee Break. . . . Sun 9:40 am to 10:10 am

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 1
Room: California . . . Sun 8:00 am to 9:40 am

Cardiac Procedures
Session Chairs: **Maryam E. Rettmann,** Mayo Clinic (USA); **David R. Holmes III,** Mayo Clinic (USA)

8:00 am: **Improved image guidance technique for minimally invasive mitral valve repair using tracked 3D ultrasound**, Adam Rankin, John T. Moore, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Daniel Bainbridge, The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada); Terry M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) . . . . . [9786-1]

8:20 am: **Cognitive tools pipeline for assistance of mitral valve surgery**, Nicolai J. Schoch, UniversitätsKlinikum Heidelberg (Germany); Patrick Philipp, Tobias Weller, Karlsruher Institut für Technologie (Germany); Sandy Engelhardt, Deutsches Krebsforschungszentrum (Germany); Mykola Volovyk, Karlsruher Institut für Technologie (Germany); Andreas Fetzer, Marco Nolden, Deutsches Krebsforschungszentrum (Germany); Raffaele de Simone, UniversitätsKlinikum Heidelberg (Germany); Ivo Wolf, Deutsches Krebsforschungszentrum (Germany); Maria Maleshkova, Achim Rettinger, Rudi Studer, Karlsruher Institut für Technologie (Germany); Vincent Heuveline, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . [9786-2]

8:40 am: **Dynamic tracking of prosthetic valve motion and deformation from bi-plane x-ray views: feasibility study**, Charles R. Hatt, Martin G. Wagner, Amish N. Raval, Michael A. Speidel, Univ. of Wisconsin-Madison (USA) . . . . . .[9786-3]

9:00 am: **Classification of calcium in intravascular OCT images for the purpose of intervention planning**, Ronny Y. Shalev, Case Western Reserve Univ. (USA); Daisuke Nakamura, Setsu Nishino, Univ. Hospitals of Cleveland (USA); Andrew Rollins, Case Western Reserve Univ. (USA); Hiram Bezerra, Univ. Hospitals Case Medical Ctr. (USA); Soumya Ray, David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9786-4]

9:20 am: **Fusion of CTA and XA data using 3D centerline registration for plaque visualization during coronary intervention**, Gaurav Kaila, Technische Univ. Delft (Netherlands); Pieter Kitslaar, Leiden Univ. Medical Ctr. (Netherlands) and Medis Medical Imaging Systems B.V. (Netherlands); Boudewijn Lelieveldt, Jouke Dijkstra, Leiden Univ. Medical Ctr. (Netherlands); Shengxian Tu, Shanghai Jiao Tong Univ. (China); Martin Penicka, Onze-Lieve-Vrouw Gasthuis vzw (Belgium). . . . . [9786-5]

Coffee Break. . . . Sun 9:40 am to 10:10 am

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 1A
Room: San Diego . . . . . .Sun 8:40 to 9:40 am

Keynote
Session Chair: **Jianguo Zhang,** Shanghai Institute of Technical Physics (China)

8:40 am: **Connecting images to the electronic medical record: structured reporting, machine learning, and natural language processing** *(Keynote Presentation)*, Curtis P. Langlotz M.D., Stanford Univ. Medical Ctr. (USA) . . . . . .[9789-100]

Coffee Break. . . . Sun 9:40 am to 10:10 am

9789 continues on page 29

CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: Royal Palm One

SESSION 1
Room: Royal Palm One . Sun 8:00 to 9:40 am

Motion and Deformation Imaging
Session Chair: **Brett C. Byram,** Vanderbilt Univ. (USA)

8:00 am: **Perfusion imaging with non-contrast ultrasound**, Jaime E. Tierney, Douglas M. Dumont, Brett C. Byram, Vanderbilt Univ. (USA) . . . . . .[9790-1]

8:20 am: **Estimation of the velocity of the popliteal vein using transverse oscillation**, Thor Bechsgaard M.D., Kristoffer L. Hansen M.D., Andreas H. Brandt M.D., Rigshospitalet (Denmark); Simon Holbek, Technical Univ. of Denmark (Denmark); Charlotte Strandberg M.D., Niels Bækgaard M.D., Gentofte Hospital (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark); Michael B. Nielsen M.D., Rigshospitalet (Denmark) . . . . . .[9790-2]

8:40 am: **High frame rate synthetic aperture vector flow imaging for transthoracic echocardiography**, Carlos A. Villagomez Hoyos, Matthias B. Stuart, Technical Univ. of Denmark (Denmark); Thor Bechsgaard M.D., Rigshopitalet (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark); Michael B. Nielsen, Rigshopitalet (Denmark) .[9790-3]

9:00 am: **3D vector flow using a row-column addressed CMUT array**, Simon Holbek, Ctr. for Fast Ultrasound Imaging (Denmark); Thomas L. Christiansen, Mathias Engholm, DTU Nanotech (Denmark); Mathias B. Stuart, Ctr. for Fast Ultrasound Imaging (Denmark); Christopher Beers, Sound Technology, Inc. (USA); Lars N. Moesner, BK Ultrasound (Denmark); Erik V. Thomsen, DTU Nanotech (Denmark); Jørgen A. Jensen, Ctr. for Fast Ultrasound Imaging (Denmark) . . . . . .[9790-4]

9:20 am: **Fast myocardial strain estimation from 3D ultrasound through elastic image registration with analytic regularization**, Bidisha Chakraborty, Brecht Heyde, Martino Alessandrini, Jan D'hooge, KU Leuven (Belgium) . . .[9790-5]

Coffee Break. . . . Sun 9:40 am to 10:10 am

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SUNDAY 28 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 2
Room: Town & Country . Sun 10:10 am to 12:10 pm

Breast Imaging
Session Chairs: **Andreu Badal,** U.S. Food and Drug Administration (USA); **Wei Zhao,** Stony Brook Medicine (USA)

10:10 am: **Simulation of 3D synthetic breast blocks**, Premkumar Elangovan, Univ. of Surrey (UK); David R. Dance, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK); Kevin Wells, Univ. of Surrey (UK) . . . . . .[9783-6]

10:30 am: **Rayleigh imaging in mammography**, Karl Berggren, Philips Healthcare (Sweden) and KTH Royal Institute of Technology (Sweden); Mats Danielsson, KTH Royal Institute of Technology (Sweden); Erik Fredenberg, Philips Healthcare (Sweden) . . . . .[9783-7]

10:50 am: **Reproducing 2D breast mammography images with 3D printed phantoms**, Matthew Clark, Univ. of Maryland, College Park (USA); Bahaa Ghammraoui, Andreu Badal, U.S. Food and Drug Administration (USA) . . . . . .[9783-8]

11:10 am: **Breast ultrasound tomography with two parallel transducer arrays**, Lianjie Huang, Junseob Shin, Ting Chen, Youzuo Lin, Kai Gao, Miranda Intrator, Kenneth Hanson, Los Alamos National Lab. (USA) . . . . . .[9783-9]

11:30 am: **A new open-source multi-modality digital breast phantom**, Christian G. Graff, U.S. Food and Drug Administration (USA) . . . . . .[9783-10]

11:50 am: **Estimating breast thickness for dual-energy subtraction in contrast-enhanced digital mammography using calibration phantoms**, Kristen C. Lau, Young Joon Kwon, Moez K. Aziz, Andrew D. A. Maidment, The Univ. of Pennsylvania Health System (USA) . . . . . [9783-11]

Lunch Break . . . . Sun 12:10 pm to 1:20 pm

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 2
Room: Golden West . .Sun 10:10 am to 12:10 pm

Musculoskeletal and Miscellaneous
Session Chairs: **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA); **Carol L. Novak,** Siemens Corp., Corporate Technology (USA)

10:10 am: **Differentiation of fat, muscle, and edema in thigh MRIs using random forest classification**, William Kovacs, Chia-Ying Liu, Ronald M. Summers, Jianhua Yao, National Institutes of Health (USA) . .[9785-6]

10:30 am: **Assessing vertebral fracture risk on volumetric quantitative computed tomography by geometric characterization of trabecular bone structure**, Walter Checefsky, Anas Z. Abidin, Mahesh B. Nagarajan, Univ. of Rochester (USA); Jan S. Bauer, Thomas H. Baum, Technische Univ. München (Germany); Axel Wismüller M.D., Univ. of Rochester (USA) and Ludwig-Maximilians Univ. München (Germany)[9785-7]

10:50 am: **Classification of voting patterns to improve the generalized Hough transform for epiphyses localization**, Ferdinand Hahmann, Gordon Böer, Eric Gabriel, Fachhochschule Kiel (Germany); Thomas M. Deserno, Uniklinik RWTH Aachen (Germany); Carsten Meyer, Hauke Schramm, Fachhochschule Kiel (Germany) and Christian-Albrechts-Univ. zu Kiel (Germany) . . . . . .[9785-8]

11:10 am: **Medical Sieve: a cognitive assistant for radiologists and cardiologists**, Tanveer F. Syeda-Mahmood, IBM Research - Almaden (USA) . . . .[9785-9]

11:30 am: **Acne image analysis: lesion localization and classification**, Fazly S. Abas, Benjamin Kaffenberger, Joseph Bikowski, The Ohio State Univ. (USA); Metin N. Gurcan, The Ohio State Univ. Wexner Medical Ctr. (USA). . . . . [9785-10]

11:50 am: **Classification of melanoma lesions using sparse coded features and random forests**, Mojdeh Rastgo Dastjerdi, Guillaume Lemaitre, Univ. de Girona (France) and Univ. de Bourgogne (France); Olivier Morel, Joan Massich, Univ. de Bourgogne (France); Rafael Garcia, Univ. de Girona (Spain); Fabrice Meriaudeau, Franck Marzani, Désiré Sidibé, Univ. de Bourgogne (France) . . . . . [9785-11]

Lunch Break . . . . Sun 12:10 pm to 1:20 pm

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 2
Room: California . Sun 10:10 am to 12:10 pm

Segmentation and 2D and 3D Registration
Session Chairs: **David R. Haynor,** Univ. of Washington (USA); **Baowei Fei,** Emory Univ. (USA)

10:10 am: **Random walk based segmentation for the prostate on 3D transrectal ultrasound images**, Baowei Fei, Emory Univ. (USA); Ling Ma, Emory Univ. (USA) and Beijing Institute of Technology (China); Rongrong Guo, Zhiqiang Tian, Emory Univ. (USA); Rajesh Venkataraman, Saradwata Sarkar, Eigen Inc. (USA); Xiabi Liu, Beijing Institute of Technology (China); Peter T. Nieh, Viraj Master, David M. Schuster, Emory Univ. (USA). . . . . [9786-6]

10:30 am: **Resection planning for robotic acoustic neuroma surgery**, Kepra McBrayer, Vanderbilt Univ. (USA); George B. Wanna M.D., Vanderbilt Univ. Medical Ctr. (USA); Benoit M. Dawant, Vanderbilt Univ. (USA); Ramya Balachandran, Robert F. Labadie M.D., Vanderbilt Univ. Medical Ctr. (USA); Jack H. Noble, Vanderbilt Univ. (USA). . . . . [9786-7]

10:50 am: **Fat segmentation on chest CT images via fuzzy models**, Yubing Tong, Jayaram K. Udupa, Caiyun Wu, Gargi Pednekar, Janani R. Subramanian, Univ. of Pennsylvania (USA); David J. Lederer, Columbia Univ. Medical Ctr. (USA); Jason Christie, Drew A. Torigian, Univ. of Pennsylvania (USA) . . . . . [9786-8]

11:10 am: **Automatic masking for robust 3D-2D image registration in image-guided spine surgery**, Michael D. Ketcha, Tharindu De Silva, Ali Uneri, Johns Hopkins Univ. (USA); Gerhard Kleinszig, Siemens AG (Germany); Sebastian Vogt, Siemens Medical Solutions USA, Inc. (Germany); Jean-Paul Wolinsky, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9786-9]

11:30 am: **Robust patella motion tracking using intensity-based 2D-3D registration on dynamic bi-plane fluoroscopy: toward quantitative assessment in MPFL reconstruction surgery**, Yoshito Otake, Matthieu Esnault, Nara Institute of Schience and Technology (Japan); Robert Grupp, Johns Hopkins Univ. (USA); Shinichi Kosugi, Nara Prefecture Western Medical Ctr. (Japan); Yoshinobu Sato, Nara Institute of Science and Technology (Japan). . . [9786-10]

11:50 am: **Fast generation of digitally reconstructed radiograph through an efficient preprocessing of ray attenuation values**, Soheil Ghafurian, Dimitris Metaxas, Virak Tan, Kang Li, Rutgers, The State Univ. of New Jersey (USA) . . . . . [9786-11]

Lunch Break. . . . . .Sun 12:10 pm to 1:20 pm

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 1
Room: San Diego . . .Sun 10:10 am to 1:20 pm

Imaging Informatics for Precision Medicine
Session Chair: **Wyatt Tellis,** Univ. of California, San Francisco (USA)

10:10 am: **Patient-tailored multimodal neuroimaging, visualization and quantification of human intra-cerebral hemorrhage**, Sheng-Yang M. Goh, Andrei Irimia, The Univ. of Southern California (USA); Paul M. Vespa, Univ. of California, Los Angeles (USA); John D. Van Horn, The Univ. of Southern California (USA). [9789-1]

10:30 am: **Radiogenomic analysis of breast cancer: dynamic contrast enhanced -MRI based features are associated with molecular subtypes**, Shijian Wang, Ming Fan, Hangzhou Dianzi Univ. (China); Juan Zhang, Zhejiang Cancer Hospital (China); Bin Zheng, The Univ. of Oklahoma (USA); Xiaojia Wang, Zhejiang Cancer Hospital (China); Lihua Li, Hangzhou Dianzi Univ. (China) . . . .[9789-2]

10:50 am: **Dynamic contrast-enhanced MR imaging for prediction of response to neoadjuvant chemotherapy in breast cancer**, Juzhong Fu, Ming Fan, Hangzhou Dianzi Univ. (China); Bin Zheng, The Univ. of Oklahoma (USA); Guoliang Shao, Juan Zhang, Zhejiang Cancer Hospital (China); Lihua Li, Hangzhou Dianzi Univ. (China). . . . . .[9789-3]

11:10 am: **Automatic lung nodule classification with radiomics approach**, Jingchen Ma, Qian Wang, Yacheng Ren, Haibo Hu, Jun Zhao, Shanghai Jiao Tong Univ. (China) . . . . . .[9789-4]

Lunch Break . . . . Sun 11:30 am to 1:20 pm

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CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: Royal Palm One

SESSION 2
Room: Royal Palm One . . . . . Sun 10:10 am to 12:10 pm

Ultrasound Tomography and Reconstruction
Session Chairs: **Olivier Roy,** Delphinus Medical Technologies, Inc. (USA); **Torsten Hopp,** Karlsruher Institut für Technologie (Germany)

10:10 am: **Breast tumour visualization using 3D quantitative ultrasound spectroscopy**, Mehrdad J. Gangeh, Univ. of Toronto (Canada); Abdul Raheem, Sunnybrook Research Institute (Canada); Hadi Tadayyon, Univ. of Toronto (Canada); Simon Liu, Farnoosh Hadizad, Sunnybrook Research Institute (Canada); Gregory J. Czarnota, Sunnybrook Health Sciences Ctr. (Canada) . . . . . .[9790-6]

10:30 am: **Spatial smoothing coherence factor for ultrasound computed tomography**, Cuijuan Lou, Mengling Xu, Ming Yue Ding, Ming Yuchi, Huazhong Univ. of Science and Technology (China) . .[9790-7]

10:50 am: **Analysis of patient movement during 3D USCT data acquisition**, Nicole V. Ruiter, Torsten Hopp, Michael Zapf, Ernst Kretzek, Hartmut E. Gemmeke, Karlsruher Institut für Technologie (Germany). . .[9790-8]

11:10 am: **3D ultrasound computer tomography: update from a clinical study**, Torsten Hopp, Michael Zapf, Ernst Kretzek, Julia Henrich, Alexey Tukalo, Hartmut E. Gemmeke, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany) . . . . . .[9790-9]

11:30 am: **Ultrasound breast imaging using frequency domain reverse time migration**, Olivier Roy, Delphinus Medical Technologies, Inc. (USA); Mohammad Akbar Hosain Zuberi, Gerhard Pratt, Western Univ. (Canada); Neb Duric, Delphinus Medical Technologies, Inc. (USA). . . . . [9790-10]

11:50 am: **Frequency-domain ultrasound waveform tomography breast attenuation imaging**, Gursharan S. Sandhu, Cuiping Li, Delphinus Medical Technologies, Inc. (USA) and Karmanos Cancer Institute (USA); Olivier Roy, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA); Erik West, Katelyn Montgomery, Delphinus Medical Technologies, Inc. (USA); Neb Duric, Delphinus Medical Technologies, Inc. (USA) and Karmanos Cancer Institute (USA). . . . . [9790-11]

Lunch Break. . . . . .Sun 12:10 pm to 1:20 pm

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SUNDAY 28 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 3
Room: Town & Country . .Sun 1:20 to 3:00 pm

Keynote and Dual and Multi Energy CT

Session Chairs: **Despina Kontos,** Univ. of Pennsylvania (USA); **Thomas G. Flohr,** Siemens Healthcare GmbH (Germany)

1:20 pm: **Explorer: Changing the molecular imaging paradigm with total-body PET/CT** *(Keynote Presentation)*, Simon R. Cherry, Univ. of California, Davis (USA) . . . . . [9783-12]

2:20 pm: **Dictionary-based image denoising for dual-energy computed tomography**, Korbinian Mechlem, Sebastian Allner, Technische Univ. München (Germany); Kai Mei, Klinikum rechts der Isar der Technischen Univ. München (Germany); Franz Pfeiffer, Technische Univ. München (Germany) and Klinikum rechts der Isar der Technischen Univ. München (Germany); Peter B. Noël, Klinikum rechts der Isar der Technischen Univ. München (Germany) and Technische Univ. München (Germany) . . . . . [9783-13]

2:40 pm: **Reconstruction of limited-angle multi-energy CT using joint clustering prior and sparsity regularization**, Huayu Zhang, Univ. of Wisconsin-Madison (USA); Yuxiang Xing, Tsinghua Univ. (China) . . . . . [9783-14]

Coffee Break. . . . .Sun 3:00 pm to 3:30 pm

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 3
Room: Golden West . Sun 1:20 pm to 3:00 pm

Lung and Chest I

Session Chairs: **Matthew S. Brown,** Univ. of California, Los Angeles (USA); **Catalin Fetita,** Télécom SudParis (France)

1:20 pm: **Localized Fisher vector representation for pathology detection in chest radiographs**, Ofer Geva, Tel Aviv Univ. (Israel); Sivan Lieberman, Eli Konen, The Chaim Sheba Medical Ctr., Tel Hashomer (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel). . . . . [9785-12]

1:40 pm: **Intensity targeted radial structure tensor analysis and its application for automated mediastinal lymph node detection from CT volumes**, Hirohisa Oda, Yukitaka Nimura, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Shingo Iwano, Nagoya Univ. (Japan); Hirotoshi Honma, Sapporo Kosei Hospital (Japan); Hirotsugu Takabatake, Minami Sanjyo Hospital (Japan); Masaki Mori, Sapporo Kosei Hospital (Japan); Hiroshi Natori, Keiwakai Nishioka Hospital (Japan); Kensaku Mori, Nagoya Univ. (Japan)[9785-13]

2:00 pm: **Automatic aortic root segmentation in CT: a whole-body dataset**, Xinpei Gao, Pieter Kitslaar, Arthur J. H. A. Scholte, Boudewijn P. F. Lelieveldt, Jouke Dijkstra, Johan H. C. Reiber, Leiden Univ. Medical Ctr. (Netherlands). . . . . [9785-14]

2:20 pm: **Effects of CT dose and nodule characteristics on CAD performance in a cohort of 90 National Lung Screening Trial patients**, Stefano Young, Pechin Lo, John M. Hoffman, Hyun J. G. Kim, Matthew S. Brown, Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA) . . . . . [9785-15]

2:40 pm: **An automated lung nodule detection system for CT images using synthetic minority oversampling**, Shrikant A. Mehre, Sudipta Mukhopadhyay, Indian Institute of Technology Kharagpur (India); Anirvan Dutta, Birla Institute of Technology Mesra (India); Nagam C. Harsha, National Institute of Technology, Durgapur (India); Ashis K. Dhara, Indian Institute of Technology Kharagpur (India); Niranjan Khandelwal, Postgraduate Institute of Medical Education & Research (India). . . . [9785-16]

Coffee Break. . . . .Sun 3:00 pm to 3:30 pm

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 3
Room: California . . . Sun 1:20 pm to 3:00 pm

Spine and Percutaneous Procedures

Session Chairs: **Gabor Fichtinger,** Lab. for Percutaneous Surgery (Canada); **David J. Hawkes,** Univ. College London (UK)

1:20 pm: **Accurate biopsy-needle depth estimation in limited-angle tomography using multi-view geometry**, Fons van der Sommen, Svitlana Zinger, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands). . . . . [9786-12]

1:40 pm: **Automatic geometric rectification for patient registration in image-guided spinal surgery**, Yunliang Cai, Jonathan Olson, Xiaoyao Fan, Thayer School of Engineering at Dartmouth (USA); Linton Evans, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA) and Dartmouth Hitchcock Medical Ctr (USA); David Roberts, Sohail Mirza, Stuart S. Lollis, Dartmouth Hitchcock Medical Ctr. (USA); Songbai Ji, Thayer School of Engineering at Dartmouth (USA) and Dartmouth Hitchcock Medical Ctr. (USA). . . . . [9786-13]

2:00 pm: **Real-time self-calibration of a tracked augmented reality display**, Zachary M. C. Baum, Andras Lasso, Tamas Ungi M.D., Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada) . . . . . [9786-14]

2:20 pm: **Study into clinical workflow for spinal curvature measurement with portable ultrasound**, Reza Tabanfar, Queen's Univ. (Canada) and Lab. for Percutaneous Surgery (Canada); Christina Yan, Lab. for Percutaneous Surgery (Canada); Michael Kempston, Daniel Borschneck, Queen's Univ. (Canada); Tamas Ungi, Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada) . [9786-15]

2:40 pm: **MIND demons for MR-to-CT deformable image registration in image-guided spine surgery**, Sureerat Reaungamornrat, Tharindu De Silva, Ali Uneri, Johns Hopkins Univ. (USA); Jean-Paul Wolinsky, The Johns Hopkins Hospital (USA); Akhil J. Khanna, Johns Hopkins Health Care & Surgery Ctr. (USA); Gerhard Klienszig, Sebastian Vogt, Siemens AG (Germany); Jerry L. Prince, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9786-16]

Coffee Break. . . . .Sun 3:00 pm to 3:30 pm

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 2
Room: San Diego . . . .Sun 1:20 pm to 3:00 pm

Surgical PACS, 3D Printing, and Imaging Informatics for Non-radiological Applications

Session Chair: **Thomas Deserno,** Uniklinik RWTH Aachen (Germany)

1:20 pm: **Development of a gestural interface with message hooking for manupulating medical images in the operating room**, Ben Joonyeon Park, Taekjin Jang, Jong Woo Choi M.D., Namkug Kim, Asan Medical Ctr. (Korea, Republic of). . . . . .[9789-5]

1:40 pm: **3D printed cardiac phantom for procedural planning of a transcatheter native mitral valve replacement**, Richard L. Izzo, The Jacobs Institute (USA) and Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Ryan P. O'Hara, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Vijay Iyer M.D., Rose Hansen, UBMD Interventional Cardiology (USA); Rebecca L. Berg, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA); Michael Springer, The Jacobs Institute (USA); Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA) . . . . . .[9789-6]

2:00 pm: **Advanced 3D mesh manipulation in stereolithographic files and post-print processing for the manufacturing of patient-specific vascular flow phantoms**, Ryan P. O'Hara, Arpita Chand, Sowmya Vidiyala, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Stacie M. Arechavala, Univ. of Miami (USA) and Toshiba Stroke and Vascular Research Ctr. (USA); Stephen Rudin, Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA) . .[9789-7]

2:20 pm: **A deep semantic mobile application for thyroid cytopathology**, Edward Kim, Miguel Corte-Real, Villanova Univ. (USA); Zubair W. Baloch, Perelman School of Medicine, Univ. of Pennsylvania (USA). . . . . .[9789-8]

2:40 pm: **Interconnecting smartphone, image analysis server, and case report forms in clinical trials for automatic skin lesion tracking in clinical trials**, Daniel Haak, Aliaa Doma, Alexander Gombert, Thomas Deserno, Uniklinik RWTH Aachen (Germany) . . . . . .[9789-9]

Coffee Break. . . . .Sun 3:00 pm to 3:30 pm

9789 continues on page 31

CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: Royal Palm One

SESSION 3
Room: Royal Palm One . Sun 1:20 to 3:00 pm

Ultrasound Image Analysis and Tissue Characterization

Session Chair: **Brecht Heyde,** Univ. of Leuven (Belgium), Duke Univ. (USA)

1:20 pm: **Automatic left-atrial segmentation from cardiac 3D ultrasound: a dual-chamber model-based approach** , Nuno Almeida, KU Leuven (Belgium) and GE Vingmed Ultrasound AS (Norway); Sebastian Imre Sarvari, Oslo Univ. Hospital (Norway) and Ctr. for Cardiological Innovation (Norway); Fredrik Orderud, Olivier Gerard, GE Vingmed Ultrasound AS (Norway); Jan D'hooge, KU Leuven (Belgium); Eigil Samset, GE Vingmed Ultrasound AS (Norway) and Ctr. for Cardiological Innovation (CCI) (Norway). . . . . [9790-12]

1:40 pm: **Automatic short axis orientation of the left ventricle in 3D ultrasound recordings**, João Pedrosa, Brecht Heyde, Piet Claus, Jan D'hooge, Lab. on Cardiovascular Imaging and Dynamics (Belgium) . . . . . [9790-13]

2:00 pm: **Robust spatio-temporal registration of 4D cardiac ultrasound sequences**, Jørn Bersvendsen, GE Vingmed Ultrasound (Norway) and Univ. I Oslo (Norway) and Ctr. for Cardiological Innovation (Norway); Matthew Toews, École de Technologie Supérieure (Canada); Adriyana Danudibroto, KU Leuven (Belgium); William M. Wells III, Brigham and Women's Hospital (USA) and Harvard Medical School (USA); Stig Urheim M.D., Oslo Univ. Hospital (Norway); Raúl San José Estépar, Brigham and Women's Hospital (USA) and Harvard Medical School (USA); Eigil Samset, GE Vingmed Ultrasound (Norway) and Univ. I Oslo (Norway) and Ctr. for Cardiological Innovation (Norway) . . . . . [9790-14]

2:20 pm: **A new approach to ultrasonic elasticity imaging**, Cameron Hoerig, Jamshid Ghaboussi, Michael F. Insana, Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9790-15]

2:40 pm: **Experimental characterization, comparison, and image quality assessment of two ultrasound contrast Agents: optison and definity**, Amy Hughes, Steven Day, Cristian A. Linte, Rochester Institute of Technology (USA); Karl Q. Schwarz M.D., Univ. of Rochester Medical Ctr. (USA) . . . . . [9790-16]

Coffee Break. . . . .Sun 3:00 pm to 3:30 pm

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SUNDAY 28 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 4
Room: Town & Country . .Sun 3:30 to 5:30 pm

Cone Beam CT I: New Technologies, Corrections

Session Chairs: **John Yorkston,** Carestream Health, Inc. (USA); **Hilde Bosmans,** KU Leuven (Belgium)

3:30 pm: **Multipurpose robotic x-ray system for 2D radiographic and 3D cone-beam CT imaging**, Andreas Fieselmann, Jan Steinbrener, Anna K. Jerebko, Thomas Mertelmeier, Siemens AG (Germany) . . . . . [9783-15]

3:50 pm: **Image-based motion compensation for high-resolution extremities cone-beam CT**, Alejandro Sisniega, Joseph W. Stayman, Qian Cao, Johns Hopkins Univ. (USA); John Yorkston, Carestream Health, Inc. (USA); Jeffrey H. Siewerdsen, Wojciech Zbijewski, Johns Hopkins Univ. (USA) . . . . . [9783-16]

4:10 pm: **Striped ratio grids for scatter estimation**, Scott S. Hsieh, Stanford Univ. (USA); Adam S. Wang, Josh M. Star-Lack, Varian Medical Systems, Inc. (USA) . [9783-17]

4:30 pm: **Five-dimensional motion compensation for respiratory and cardiac motion with cone-beam CT of the thorax region**, Sebastian Sauppe, Andreas Hahn, Deutsches Krebsforschungszentrum (Germany); Marcus Brehm, Pascal Paysan, Varian Medical Systems, Inc. (Switzerland); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) [9783-18]

4:50 pm: **Over-exposure correction in knee cone-beam CT imaging with automatic exposure control using a partial low-dose scan**, Jang-Hwan Choi, Kerstin Muller, Scott S. Hsieh, Stanford Univ. (USA); Andreas K. Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Garry Gold M.D., Marc Levenston, Rebecca Fahrig, Stanford Univ. (USA) . . . . . [9783-19]

5:10 pm: **Offset detector super short scan reconstruction for the rotate-plus-shift trajectories and its application to C-arm CT systems**, Jan Kuntz, Michael Knaup, Deutsches Krebsforschungszentrum (Germany); Christof Fleischmann, Ziehm Imaging GmbH (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) . . . . . [9783-20]

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 4
Room: Golden West . . . . Sun 3:30 to 5:30 pm

Breast

Session Chairs: **Hiroshi Fujita,** Gifu Univ. School of Medicine (Japan); **Karen Drukker,** The Univ. of Chicago (USA)

3:30 pm: **Quantification of mammographic masking risk with volumetric breast density maps: how to select women for supplemental screening**, Katharina Holland, Radboud Univ. Medical Ctr. (Netherlands); Carla H. van Gils, Johanna O. P. Wanders, Univ. Medical Ctr. Utrecht (Netherlands); Ritse M. Mann, Nico Karssemeijer, Radboud Univ. Medical Ctr. (Netherlands) . [9785-17]

3:50 pm: **Seamless lesion insertion in digital mammography: methodology and reader study**, Aria X. Pezeshk, Berkman Sahiner, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9785-18]

4:10 pm: **Workflow improvements for digital breast tomosynthesis: computerized generation of enhanced synthetic images**, Sergei Fotin, Yin Yin, Hrishikesh Haldankar, Jeffrey Hoffmeister, Senthil Periaswamy, iCAD, Inc. (USA) . . . . . [9785-19]

4:30 pm: **A fully automated system for quantification of background parenchymal enhancement in breast DCE-MRI**, Mehmet U. Dalmis, Albert Gubern-Mérida, Cristina Borelli, Suzan Vreemann, Ritse M. Mann, Nico Karssemeijer, Radboud Univ. Medical Ctr. (Netherlands). . . . . .[9785-20]

4:50 pm: **Parenchymal texture measures weighted by breast anatomy: preliminary optimization in a case-control study**, Aimilia Gastounioti, Brad M. Keller, Meng-Kang Hsieh, Emily F. Conant M.D., Despina Kontos, Univ. of Pennsylvania (USA) . . . . . [9785-21]

5:10 pm: **Automated linking of suspicious findings between automated 3D breast ultrasound volumes**, Albert Gubern-Mérida, Tao Tan, Jan van Zelst, Ritse M. Mann, Nico Karssemeijer, Radboud Univ. Medical Ctr. (Netherlands). . . . . .[9785-22]

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 4
Room: California . . . . . Sun 3:30 to 5:30 pm

Ultrasound Image Guidance

Joint Session with Conferences 9786 and 9790

Session Chairs: **Parvin Mousavi,** Queen's Univ. (Canada); **Brecht Heyde,** Univ. of Leuven (Belgium), Duke Univ. (USA)

3:30 pm: **Automatic detection of a hand-held needle in ultrasound via phased-based analysis of the tremor motion**, Parmida Beigi, Septimiu E. Salcudean, Robert Rohling, The Univ. of British Columbia (Canada); Gary C. Ng, Philips Ultrasound, Inc. (USA) . . . . . [9786-17]

3:50 pm: **Development of 3D ultrasound needle guidance for high-dose-rate interstitial brachytherapy of gynaecological cancers**, Jessica R. Rodgers, David Tessier, Robarts Research Institute (Canada) and Western Univ. (Canada); David D'Souza, London Regional Cancer Program (Canada); Eric Leung, Odette Cancer Ctr. (Canada) and Sunnybrook Health Sciences Ctr. (Canada); George Hajdok, London Regional Cancer Program (Canada); Aaron Fenster, Robarts Research Institute (Canada) and Western Univ. (Canada). . . . . [9790-17]

4:10 pm: **Ultrasound to video registration using a bi-plane transrectal probe with photoacoustic markers**, Alexis Cheng, Hyun Jae Kang, Russell H. Taylor, Emad M. Boctor, Johns Hopkins Univ. (USA) . . . . . [9786-18]

4:30 pm: **Classification of prostate cancer grade using temporal ultrasound: in vivo feasibility study**, Sahar Ghavidel, Queen's Univ. (Canada); Farhad Imani, Purang Abolmaesumi, Siavash Khallaghi, The Univ. of British Columbia (Canada); Eli Gibson, Western Univ. (Canada); Amir Khojaste, Queen's Univ. (Canada); Mena Gaed M.D., Western Univ. (Canada); Madeleine Moussa, José A. Gomez, London Health Sciences Ctr. (Canada); D. Robert Siemens, Michael Leveridge, Kingston General Hospital (Canada); Silvia Chang, Vancouver General Hospital (Canada); Aaron Fenster, Aaron D. Ward, Western Univ. (Canada); Parvin Mousavi, Queen's Univ. (Canada) [9786-19]

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 3
Room: San Diego . . . . . .Sun 3:30 to 5:30 pm

Imaging Informatics for Diagnostics and Therapeutic Applications

Session Chair: **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China)

3:30 pm: **Streamlining an interactive Bayesian-based diagnostic support tool alongside traditional PACS system**, Po-Hao Chen M.D., Emmanuel Botzolakis M.D., Suyash Mohan M.D., Robert N. Bryan M.D., Tessa S. Cook M.D., The Univ. of Pennsylvania Health System (USA). [9789-10]

3:50 pm: **Improved superficial brain hemorrhage visualization in susceptibility weighted images by constrained minimum intensity projection**, Marcelo A. Castro, Ctr. for Neuroscience and Regenerative Medicine, Henry M. Jackson Foundation (USA); Dzung L. Pham, Ctr. for Neuroscience and Regenerative Medicine, Henry M. Jackson Foundation (USA); John A. Butman, National Institutes of Health (USA)[9789-11]

4:10 pm: **Multi-site evaluation of a clinical decision support system for radiation therapy**, Ruchi R. Deshpande, Brent J. Liu, The Univ. of Southern California (USA); Kerstin A. Kessel, Technische Univ. München (Germany). . . . . [9789-12]

4:30 pm: **Lesion registration for longitudinal disease tracking using thin-plate splines deformation for multiple sclerosis eFolder**, Kevin C. Ma, Xuejun Zhang, Lilyana Amezcua, Mark Shiroishi, Alex Lerner, Brent J. Liu, The Univ. of Southern California (USA) . . . . . [9789-13]

4:50 pm: **Altered effective connectivity within default mode network in major depression disorder**, Liang Li, Baojuan Li, Yuanhan Bai, Huaning Wang, Linchuan Zhang, Longbiao Cui, Hong Yin, Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . [9789-14]

5:10 pm: **Segmentation of bone pixels from EROI Image using Clustering Method for Bone Age Assessment**, rajitha bakthula, Motilal Nehru National Institute of Technology (India) . . . [9789-15]

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CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: California

SESSION 4
Room: California . . . . . .Sun 3:30 to 5:30 pm

NOTE ROOM CHANGE

Ultrasound Image Guidance

Joint Session with Conferences 9786 and 9790

Session Chairs: **Parvin Mousavi,** Queen's Univ. (Canada); **Brecht Heyde,** Univ. of Leuven (Belgium), Duke Univ. (USA)

3:30 pm: **Automatic detection of a hand-held needle in ultrasound via phased-based analysis of the tremor motion**, Parmida Beigi, Septimiu E. Salcudean, Robert Rohling, The Univ. of British Columbia (Canada); Gary C. Ng, Philips Ultrasound, Inc. (USA) . . . . . [9786-17]

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SUNDAY 28 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging

Room: Town & Country

WORKSHOPS
Interventional Procedures: Emerging Technologies and Clinical Applications

Room: Town & Country
Sun 5:45 to 7:45 pm

Workshop Chairs:
Despina Kontos, Univ. of Pennsylvania, (USA)
Ziv Yaniv, National Library of Medicine, (USA)

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CONFERENCE 9785
Computer-Aided Diagnosis

Room: Golden West

WORKSHOP
17th SPIE/IFCARS Joint Workshop on Information Management, Systems Integration, Standards, and Approval Issues for the Digital Operating Room

Room: Golden West
Sun 5:45 pm to 7:45 pm

Workshop Chairs: **Leonard Berliner**, New York Methodist Hospital, (USA) and **Heinz U. Lemke,** Computer Assisted Radiology and Surgery, (German

See Special Events for more information.

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: California

SESSION 4 (continued)
Room: California . . . . . Sun 3:30 to 5:30 pm

4:50 pm: **Non-invasive ultrasound method for measuring large range pressure changes in deep-positioned vessels**, Jacob B. Olesen, Carlos A. Villagomez-Hoyos, Technical Univ. of Denmark (Denmark); Marie S. Traberg, Techical Univ. of Denmark (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . [9790-18]

5:10 pm: **Automatic real-time detection of pleura and B-lines (comet-tail artifacts) on in-vivo ultrasound lung scans**, Ramin Moshavegh, Technical Univ. of Denmark (Denmark); Kristoffer Lindskov Hansen M.D., Hasse Møller Sørensen M.D., Rigshopitalet (Denmark); Martin C. Hemmsen Sr., Technical Univ. of Denmark (Denmark); Michael B. Nielsen M.D., Rigshopitalet (Denmark); Jørgen A. Jensen Sr., Technical Univ. of Denmark (Denmark) . . . . . [9790-19]

WORKSHOP
Sensing Challenges and Prospects in Miniaturizing Surgical Robots and Tools

Room: California · Sun 5:45 pm to 7:45 pm

Workshop Chair: **Jessica Burgner-Kahrs**, Leibniz Univ. Hannover, (Germany)

See Special Events for more information.

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations

Room: Golden West

WORKSHOP
17th SPIE/IFCARS Joint Workshop on Information Management, Systems Integration, Standards, and Approval Issues for the Digital Operating Room

Room: Golden West
Sun 5:45 pm to 7:45 pm

Workshop Chairs: **Leonard Berliner**, New York Methodist Hospital, (USA) and **Heinz U. Lemke,** Computer Assisted Radiology and Surgery, (German

See Special Events for more information.

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CONFERENCE 9790
Ultrasonic Imaging and Tomography

Room: California

SESSION 4 (continued)
Room: California . . . . . Sun 3:30 to 5:30 pm

4:50 pm: **Non-invasive ultrasound method for measuring large range pressure changes in deep-positioned vessels**, Jacob B. Olesen, Carlos A. Villagomez-Hoyos, Technical Univ. of Denmark (Denmark); Marie S. Traberg, Techical Univ. of Denmark (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . [9790-18]

5:10 pm: **Automatic real-time detection of pleura and B-lines (comet-tail artifacts) on in-vivo ultrasound lung scans**, Ramin Moshavegh, Technical Univ. of Denmark (Denmark); Kristoffer Lindskov Hansen M.D., Hasse Møller Sørensen M.D., Rigshopitalet (Denmark); Martin C. Hemmsen Sr., Technical Univ. of Denmark (Denmark); Michael B. Nielsen M.D., Rigshopitalet (Denmark); Jørgen A. Jensen Sr., Technical Univ. of Denmark (Denmark) . . . . . [9790-19]

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SUNDAY/MONDAY POSTERS

Location: Grand Exhibit Hall

Posters for this conference will be on display Sunday and Monday. The interactive poster session with authors in attendance will be Monday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room on Tuesday morning.

POSTER AUTHORS:

- Display your poster early on Sunday for extended viewing and consideration for a poster award.
- Poster boards will be available lunch on Sunday.
- Posters not displayed at the beginning of the interactive poster session and reception will be considered a no show.
- Stand with your poster during the interactive poster session and reception from 5:30 to 7:00 pm on Monday.
- Authors should remove their poster after the interactive poster session on Monday.
- Posters remaining on the boards after the reception will be discarded.

CONFERENCE 9783

Physics of Medical Imaging

Breast Imaging

Conceptual detector development and Monte Carlo simulation of a novel 3D breast computed tomography system, Jens Ziegle, Christoph Hoeschen, Bernhard H. Müller, Bernd Neumann, Otto-von-Guericke Univ. Magdeburg (Germany) . . . . . [9783-81]

Eigenbreasts for statistical breast phantoms, Gregory M. Sturgeon, Duke Univ. (USA); Daniel J. Tward, Johns Hopkins Univ. (USA); Subok Park, U.S. Food and Drug Administration (USA); W. Paul Segars, Joseph Y. Lo, Duke Univ. (USA) . . . . . [9783-82]

Optimal exposure techniques for iodinated contrast-enhanced breast CT, Stephen J. Glick, Andrey V. Makeev, Ctr. for Devices and Radiological Health, U.S. Food and Drug Administration (USA) . . . . [9783-83]

Simulation of spiculated breast lesions, Premkumar Elangovan, Faisal Alrehily, Rafael F. Pinto, Univ. of Surrey (UK); Alaleh Rashid Nasab, Univ. College London (UK); David R. Dance, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK); Kevin Wells, Univ. of Surrey (UK) . . . . . [9783-84]

Estimation of mammary gland composition using CdTe series detector developed for photon-counting mammography, Akiko Ihori, Chizuru Okamoto, Nagoya Univ. (Japan); Tsutomu Yamakawa, Shuichiro Yamamoto, Masahiro Okada, JOB Corp. (Japan); Ai Nakajima, Misa Kato, Yoshie Kodera, Nagoya Univ. (Japan). . . . . [9783-85]

Modeling and dimensioning a novel tissue-specific breast imaging system using spectral x-ray coherent scattering, Damien Barbes, CEA-LETI (France) . . . . . [9783-86]

Reduction of artifacts in computer simulation of breast Cooper's ligaments, David D. Pokrajac, Delaware State Univ. (USA); Andrew D. A. Maidment, Predrag R. Bakic, The Univ. of Pennsylvania Health System (USA). . . . . [9783-87]

Analysis of the scatter effect on detective quantum efficiency of digital mammography, Jiwoong Park, Pusan National Univ. (Korea, Republic of); Seungman Yun, SAMSUNG Electronics Co., Ltd. (Korea, Republic of); Dong Woon Kim, Pusan National Univ. (Korea, Republic of); Cheol-Ha Baek, Dongseo Univ. (Korea, Republic of); Hanbean Yun, Hosang Jeon, Pusan National Univ. Yangsan Hospital (Korea, Republic of) and Ctr. for Advanced Medical Engineering, Pusan National Univ. (Korea, Republic of); Ho Kyung Kim, Pusan National Univ. (Korea, Republic of) and Ctr. for Advanced Medical Engineering, Pusan National Univ. (Korea, Republic of) . [9783-88]

Comparison of contrast enhancement methods using photon counting detector in spectral mammography, Hyemi Kim, Su-Jin Park, Byungdu Jo, Do-Hyeon Kim, Hee-Joung Kim, Yonsei Univ. (Korea, Republic of) . . . . . [9783-89]

Preliminary results for MAMMOCARE prototype: breast biopsy system guided by positron emission tomography in realtime, Laura Moliner, Univ. Politècnica de València (Spain) and I3M (Spain); Jorge Alamo, ONCOVISION (GEM Imaging S.A.) (Spain); Jose L. Peris, Juan Gomez, Instituto de Biomecánica de Valencia (Spain); Paul Tattersall, HERI (UK); Vicente Carrilero López, Abel Orero, Carlos Correcher, ONCOVISION (GEM Imaging S.A.) (Spain); José María Benlloch, I3M (Spain) and Univ. Politècnica de València (Spain) . . . . . [9783-90]

Discrimination between normal breast tissue and tumor tissue using CdTe series detector developed for photon-counting mammography, Chizuru Okamoto, Akiko Ihori, Nagoya Univ. (Japan); Tsutomu Yamakawa, Shuichiro Yamamoto, Masahiro Okada, JOB Corp. (Japan); Misa Kato, Ai Nakajima, Yoshie Kodera, Nagoya Univ. (Japan) . . . [9783-91]

Grid-less imaging with anti-scatter correction software in 2D mammography: the effects on image quality and MGD under a virtual clinical validation study, Nelis Van Peteghem, Frédéric Bemelmans, Xenia Bramaje Adversalo, Elena Salvagnini, KU Leuven (Belgium); Nicholas W. Marshall, Hilde Bosmans, UZ Leuven (Belgium). .[9783-92]

Estimation of adipose compartment volumes in CT images of a mastectomy specimen, David D. Pokrajac, Abdullah-Al-Zubaer Imran, Delaware State Univ. (USA); Andrew D. A. Maidment, Predrag R. Bakic, The Univ. of Pennsylvania Health System (USA) . . . . . [9783-93]

A feasibility study for three materials decomposition in digital mammography, Dong-Hoon Lee, Ye-seul Kim, Sunghoon Choi, Haenghwa Lee, Hee-Joung Kim, Yonsei Univ. (Korea, Republic of).[9783-94]

A new paradigm of dielectric relaxation spectroscopy for non-invasive detection of breast abnormalities: a preliminary feasibility analysis, Sreeram Dhurjaty, Dhurjaty Electronics Consulting LLC (USA); Yuchen Qiu, Maxine Tan, Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9783-95]

DICOM organ dose does not accurately represent calculated dose in mammography, Moayyad E. Suleiman, Patrick C. Brennan, Lucy Cartwright, The Univ. of Sydney (Australia); Jennifer Diffey, The Univ. of Syndey (Australia); Mark F. McEntee, The Univ. of Sydney (Australia) . . . . . [9783-96]

Radiation dose differences between digital mammography and digital breast tomosynthesis are dependent on breast thickness, Maram Mustafa Alakhras, The Univ. of Sydney (Australia); Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) and Univ. of Pittsburgh School of Medicine (USA); Roger Bourne, The Univ. of Sydney (Australia); Mary Rickard, The Univ. of Sydney (Australia) and Sydney Breast Clinic (Australia); Jennifer Diffey, John Hunter Hospital (Australia); Patrick C. Brennan, The Univ. of Sydney (Australia). . . . . [9783-97]

Cone Beam CT

Ring artifacts removal via spatial sparse representation in cone beam CT, Zhongyuan Li, Guang Li, Yi Sun, Shouhua Luo, Southeast Univ. (China) . . . .[9783-98]

Library based x-ray scatter correction for dedicated cone beam breast CT, Lei Zhu, Linxi Shi, Georgia Institute of Technology (USA) . . . . . [9783-99]

Properties of the ellipse-line-ellipse trajectory with asymmetrical variations, Zijia Guo, Frédéric Noo, The Univ. of Utah (USA); Guenter Lauritsch, Siemens Healthcare GmbH (Germany). . .[9783-100]

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Classification of motor intent in transradial amputees using sonomyography and spatio-temporal image analysis, Harishwaran Hariharan, Nima Aklaghi, Alex Baker, Jana Kosecka, Huzefa Rangwala, Siddhartha Sikdar, George Mason Univ. (USA) . . . . .[9790-62]

Single element ultrasonic imaging of limb geometry: an in-vivo study with comparison to MRI, Xiang Zhang, Brian W. Anthony, Massachusetts Institute of Technology (USA) . . . . . .[9790-63]

Towards ultrasound travel time tomography for quantifying human limb geometry and material properties, Jonathan R. Fincke, Micha Feigin, Germán A. Prieto, Xiang Zhang, Brian W. Anthony, Massachusetts Institute of Technology (USA) . . . . . .[9790-64]

Transducers and Beamforming

Observations of liver cancer cells in scanning probe acoustic microscope: a preliminary study, Xiaohui Chen, Ming Yue Ding, Xiaoyue Fang, Huazhong Univ. of Science and Technology (China); Qing Xi, Tianjin Medical Univ. (China); Hua Guo, Tianjin Medical Univ. Cancer Institute and Hospital (China); Ning Zhang, Tianjin Medical Univ. (China) . . . . . .[9790-65]

A preliminary evaluation work on a 3D ultrasound imaging system for 2D array transducer, Xiaoli Zhong, Xu Li, Jiali Yang, Chunyu Li, Junjie Song, Ming Yue Ding, Ming Yuchi, Huazhong Univ. of Science and Technology (China) . . . . . .[9790-66]

A new post-phase rotation based dynamic receive beamforming architecture for smartphone-based wireless ultrasound imaging, Minsuk Park, Jeeun Kang, Gunho Lee, Min Kim, Tai Kyong Song, Sogang Univ. (Korea, Republic of) . . . . . .[9790-67]

MONDAY 29 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 5
Room: Town & Country . Mon 8:00 to 9:40 am

Phase Contrast Imaging
Session Chairs: **Mini Das,** Univ. of Houston (USA); **Guang-Hong Chen,** Univ. of Wisconsin-Madison (USA)

8:00 am: **Single-shot x-ray phase contrast imaging with an algorithmic approach using spectral detection**, Mini Das, Chan Soo Park, Univ. of Houston (USA) . . . . . [9783-21]

8:20 am: **X-ray differential phase contrast imaging using a Talbot-Lau interferometer and a photon-counting detector**, Yongshuai Ge, Ran Zhang, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9783-22]

8:40 am: **Potential use of micorobubles (MBs) as contrast material in x-ray dark field (DF) imaging: How does the DF signal change with the characteristic parameters of the MBs?**, Ran Zhang, Univ. of Wisconsin-Madison (USA); Bin Qin, Univ. of Pittsburgh (USA); Yongshuai Ge, Univ. of Wisconsin-Madison (USA); Bruce R. Whiting, Univ. of Pittsburgh (USA); Ke Li, Univ. of Wisconsin-Madison (USA); Flordeliza S. Villanueva, Univ. of Pittsburgh (USA); Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . [9783-23]

9:00 am: **Phase contrast imaging with a dual-phase grating interferometer**, Matias E. Kagias, Zhentian Wang, Marco F. M. Stampanoni, Paul Scherrer Institut (Switzerland) and ETH Zürich (Switzerland) . . . . . [9783-24]

9:20 am: **High-energy x-ray grating-based phase-contrast radiography of human anatomy**, Florian Horn, Christian Hauke, Sebastian Lachner, Veronika Ludwig, Georg Pelzer, Jens Rieger, Max Schuster, Maria Seifert, Johannes Wandner, Andreas Wolf, Thilo Michel, Gisela Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany). . . [9783-25]

Coffee Break. . . . Mon 9:40 am to 10:10 am

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 5
Room: Golden West . . . . Mon 8:00 to 9:40 am

Keynote and Deep Learning I
Session Chairs: **Lubomir M. Hadjiiski,** Univ. of Michigan Health System (USA); **Horst K. Hahn,** Fraunhofer MEVIS (Germany)

8:00 am: **Radiomics: There is more than meets the eye in medical imaging** *(Keynote Presentation)*, Hugo Aerts, Dana-Farber Cancer Institute (USA) and Brigham and Women's Hospital (USA) and Harvard Medical School (USA). . . . . [9785-23]

9:00 am: **Deep convolutional networks for automated detection of posterior-element fractures on spine CT**, Holger R. Roth, Yinong Wang, Jianhua Yao, Le Lu, National Institutes of Health (USA); Joseph E. Burns, Univ. of California, Irvine (USA); Ronald M. Summers, National Institutes of Health (USA) . . . . . [9785-24]

9:20 am: **Increasing CAD system efficacy for lung texture analysis using a convolutional network**, Sebastian R. Tarando, Catalin Fetita, Télécom SudParis (France); Pierre Yves, Univ. Paris 13 (France) . . . . . [9785-25]

Coffee Break. . . . Mon 9:40 am to 10:10 am

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 5
Room: California . . . . . Mon 8:00 to 9:40 am

Session Chairs: **Lena Maier-Hein,** Deutsches Krebsforschungszentrum (Germany); **Stefanie Speidel,** Karlsruher Institut für Technologie (Germany)

8:00 am: **Deformable registration of x-ray to MRI for post-implant dosimetry in prostate brachytherapy**, Seyoun Park, The Johns Hopkins Hospital (USA); Danny Y. Song, Sidney Kimmel Comprehensive Cancer Ctr. (USA); Junghoon Lee, Johns Hopkins Univ. (USA) . . . . . [9786-20]

8:20 am: **Evaluation of a μCT-based electro-anatomical cochlear implant model**, Ahmet Cakir, Benoit M. Dawant, Jack H. Noble, Vanderbilt Univ. (USA) . . . . . [9786-21]

8:40 am: **Fast simulated annealing and adaptive Monte Carlo sampling based parameter optimization for dense optical-flow deformable image registration of 4DCT lung anatomy**, Tai Dou, Yugang Min, John Neylon, David Thomas, Patrick Kupelian, Anand Santhanam, Univ. of California, Los Angeles (USA). . . . . [9786-22]

9:00 am: **Automatic pose correction for image-guided nonhuman primate brain surgery planning**, Soheil Ghafurian, Merck & Co., Inc. (USA) and Rutgers Univ. (USA); Antong Chen, Catherine Hines, Belma Dogdas, Ashleigh Bone, Kenneth Lodge, Stacey O'Malley, Merck & Co., Inc. (USA); Christopher T. Winkelmann, Pfizer Inc. (USA); Ansuman Bagchi, Laura S. Lubbers, Jason M. Uslaner, Colena Johnson, John Renger, Hatim A. Zariwala, Merck & Co., Inc. (USA) . . . . . [9786-23]

9:20 am: **Accurate tracking of tumor volume change during radiotherapy by CT-CBCT registration with intensity correction**, Seyoun Park, The Johns Hopkins Hospital (USA); Adam Robinson, Johns Hopkins Univ. (USA); Harry Quon, The Johns Hopkins Hospital (USA); Ana P. Kiess, Colette Shen, John Wong, Johns Hopkins Univ. (USA); William Plishker, Raj Shekhar, IGI Technologies (USA); Junghoon Lee, Johns Hopkins Univ. (USA) . . . . . [9786-24]

Coffee Break. . . . Mon 9:40 am to 10:10 am

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 4
Room: San Diego . . . . . Mon 8:00 to 9:40 am

Big Data Technologies and Image Sharing in Medical Imaging and Informatics
Session Chair: **Brent J. Liu,** The Univ. of Southern California (USA)

8:00 am: **A case-based reasoning tool for breast cancer with data mining concepts and techniques**, Souad Demigha, Univ. Paris 1 Panthéon Sorbonne (France) . . . . . [9789-16]

8:20 am: **Improving face image extraction by using deep learning technique**, Zhiyun Xue, Sameer K. Antani, Rodney Long, Dina Demner-Fushman, George R. Thoma, National Library of Medicine (USA) . . . . . [9789-17]

8:40 am: **Collection of sequential imaging events for research in breast cancer screening**, Mishal N. Patel, Kenneth C. Young, Mark D. Halling-Brown, The Royal Surrey County Hospital NHS Trust (UK) . . . . . [9789-18]

9:00 am: **Mutual Information-based feature selection for radiomics**, Estanislao Oubel, Hubert Beaumont, Median Technologies (France); Antoine Iannessi, Ctr. de Lutte Contre le Cancer Antoine Lacassagne (France). . . . [9789-19]

9:20 am: **PACS-integrated electronic data capture of DICOM data in multi-centered clinical trials**, Daniel Haak, Charles-E. Page, Thomas Deserno, Uniklinik RWTH Aachen (Germany) . . . . . [9789-20]

Coffee Break. . . . Mon 9:40 am to 10:10 am

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CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: Royal Palm One

SESSION 5
Room: Royal Palm One . Mon 8:00 to 9:40 am

Novel Imaging Strategies and Signal Processing
Session Chair: **Mohammad Mehrmohammadi,** Wayne State Univ. (USA)

8:00 am: **Sub-mSV breast XACT scanner: concept and design**, Shanshan Tang, Liqiang Ren, Pratik Samant, Jian Chen, Hong Liu, Liangzhong Xiang, The Univ. of Oklahoma (USA) . . . . . [9790-20]

8:20 am: **An evolutionary Bayesian search scheme for ultrasound modulated optical tomography**, Mamatha Venugopal, Debasish Roy, Ram Mohan Vasu, Indian Institute of Science (India). . . . . [9790-21]

8:40 am: **Monte Carlo investigation of the dosimetric effect of the Autoscan ultrasound probe for guidance of radiotherapy**, Michael Martyn, National Univ. of Ireland, Galway (Ireland); Tuathan O' Shea, The Institute of Cancer Research (UK) and The Royal Marsden NHS Foundation Trust (UK); Emma J. Harris, The Institute of Cancer Research (UK) and The Royal Marsden NHS Foundation Trust (UK); Jeffrey C. Bamber, The Institute of Cancer Research (UK) and The Royal Marsden NHS Foundation Trust (UK); Mark J. Foley, National Univ. of Ireland, Galway (Ireland) . . . . . [9790-22]

9:00 am: **Signal processing for enhanced tumor perfusion detection**, MinWoo Kim, Univ. of Illinois at Urbana-Champaign (USA); Craig K. Abbey, Univ. of California, Santa Barbara (USA); Michael F. Insana, Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9790-23]

9:20 am: **Frequency-shift low-pass filtering and least mean square adaptive filtering for ultrasound imaging**, Shanshan Wang, Chunyu Li, Ming Yue Ding, Ming Yuchi, Huazhong Univ. of Science and Technology (China) . . . . . [9790-24]

Coffee Break. . . . Mon 9:40 am to 10:10 am

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MONDAY 29 FEBRUARY

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 6
Room: Town & Country . . . . . Mon 10:10 am to 12:10 pm

Cone Beam CT II: System Optimization, Image Reconstruction

Session Chairs: **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Maria Drangova,** Robarts Research Institute (Canada)

10:10 am: **Design and characterization of a dedicated cone-beam CT scanner for detection of acute intracranial hemorrhage**, Jennifer Xu, Alejandro Sisniega, Wojciech Zbijewski, Hao Dang, Joseph W. Stayman, Johns Hopkins Univ. (USA); Xiaohui Wang, David H. Foos, Carestream Health, Inc. (USA); Nafi Aygun, Vassili E. Koliatsos, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9783-26]

10:30 am: **Intravenous 3D digital subtracted angiography (IV 3D-DSA) from a single sweep C-arm cone beam CT (CBCT) acquisition**, Yinsheng Li, Kai Niu, Pengfei Yang, Beverly D. Aagaard-Kienitz, David B. Niemann, Azam S. Ahmed, Charles M. Strother, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9783-27]

10:50 am: **C-arm cone-beam CT perfusion imaging using SMART-RECON method to improve temporal sampling density and temporal resolution**, Kai Niu, Yinsheng Li, Univ. of Wisconsin-Madison (USA); Sebastian Schafer, Kevin L. Royalty, Siemens Medical Solutions USA, Inc. (USA); Charles M. Strother, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9783-28]

11:10 am: **Nonlinear statistical reconstruction for flat-panel cone-beam CT with blur and correlated noise models**, Steven W. Tilley II, Jeffrey H. Siewerdsen, Wojciech Zbijewski, Joseph W. Stayman, Johns Hopkins Univ. (USA) . . . . . [9783-29]

11:30 am: **Automatic intrinsic cardiac and respiratory gating from cone-beam CT scans of the thorax region**, Andreas Hahn, Sebastian Sauppe, Deutsches Krebsforschungszentrum (Germany); Michael Lell, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany). . . . . [9783-30]

11:50 am: **Reduction of beam hardening artifacts in cone-beam CT imaging via SMART-RECON algorithm**, Yinsheng Li, John Garrett, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9783-31]

Lunch Break . . . . Mon 12:10 pm to 1:20 pm

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 6
Room: Golden West . . . . . Mon 10:10 am to 12:10 pm

Radiomics I

Session Chairs: **Maryellen L. Giger,** The Univ. of Chicago (USA); **Nicholas A. Petrick,** U.S. Food and Drug Administration (USA)

10:10 am: **Increasing cancer detection yield of breast MRI using a new CAD scheme of mammograms**, Maxine Tan, Faranak Aghaei, The Univ. of Oklahoma (USA); Alan B. Hollingsworth, Rebecca G. Stough, Mercy Women's Ctr. (USA); Hong Liu, Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9785-26]

10:30 am: **Identification, segmentation, and characterization of microcalcifications on mammography**, Karen Drukker, The Univ. of Chicago (USA); Serghei Malkov, Jesus Avila, Karla Kerlikowske, Bonnie Joe, Gregor Krings, Jennifer Creasman, Univ. of California, San Francisco (USA); Jennifer S. Drukteinis, Malesa M. Pereira, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Leila Kazemi, John A. Shepherd, Univ. of California, San Francisco (USA); Maryellen L. Giger, The Univ. of Chicago (USA) . . . [9785-27]

10:50 am: **Predicting Ki67% expression from DCE-MR images of breast tumors using textural kinetic features in tumor habitats**, Baishali Chaudhury, Mu Zhou, Dmitry B. Goldgof, Lawrence O. Hall, Univ. of South Florida (USA); Robert A. Gatenby, Robert J. Gillies, Jennifer S. Drukteinis, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) . . . . . [9785-28]

11:10 am: **Applying quantitative adiposity feature analysis models to predict benefit of bevacizumab-based chemotherapy in ovarian cancer patients**, Yunzhi Wang, Yuchen Qiu, The Univ. of Oklahoma (USA); Theresa Thai, Kathleen More, Kai Ding, The Univ. of Oklahoma Health Sciences Ctr. (USA); Hong Liu, Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9785-29]

11:30 am: **Radiogenomics of glioblastoma: a pilot multi-institutional study to investigate a relationship between tumor shape features and tumor molecular subtype**, Nicholas M. Czarnek, Kal L. Clark, Katherine B Peters, Maciej A. Mazurowski, Duke Univ. (USA) . . . . . [9785-30]

11:50 am: **Prognosis classification in glioblastoma multiforme using multimodal MRI derived heterogeneity textural features: impact of pre-processing choices**, Taman Upadhaya, Yannick Morvan, Institut de recherche technologique B-Com (France); Eric Stindel, Lab. de Traitement de l'Information Médicale (France); Pierre-Jean Le Reste, CHU Rennes (France); Mathieu Hatt, Lab. de Traitement de l'Information Médicale (France) . . . . [9785-31]

Lunch Break . . . . Mon 12:10 pm to 1:20 pm

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 6
Room: California . Mon 10:10 am to 12:10 pm

Robotic Systems and Treatment Planning

Session Chairs: **David M. Kwartowitz,** Clemson Univ. (USA); **Cristian A. Linte,** Rochester Institute of Technology (USA)

10:10 am: **Toward disparity joint upsampling for robust stereoscopic endoscopic scene reconstruction in robotic prostatectomy**, Xiongbiao Luo, A. Jonathan McLeod, Terry M. Peters, Western Univ. (Canada) . . . . . [9786-25]

10:30 am: **Endoscopes and robots for tight surgical spaces: use of pre-curved elastic elements to enhance curvature**, Andria A. Remirez, Robert J. Webster III, Vanderbilt Univ. (USA) . . . . . [9786-26]

10:50 am: **Disposable patient-mounted geared robot for image-guided needle insertion**, Charles Watkins, Takahisa Kato, Nobuhiko Hata, Brigham and Women's Hospital (USA) . . . . . [9786-27]

11:10 am: **Comparison of portable and conventional ultrasound imaging in spinal curvature measurement**, Christina Yan, Reza Tabanfar, Michael Kempston, Daniel Borschneck, Tamas Ungi M.D., Gabor Fichtinger, Queen's Univ. (Canada) . . . . . [9786-90]

11:30 am: **Image-guided preoperative prediction of pyramidal tract side effect in deep brain stimulation**, Clément Baumgarten, Yulong Zhao, INSERM (France) and Lab. Traitement du Signal et de l'Image (France); Cecile Malrain M.D., Paul Sauleau M.D., Ctr. Hospitalier Univ. de Rennes (France); Pierre Jannin, Univ. de Rennes 1 (France) and Lab. Traitement du Signal et de l'Image (France); Claire Haegelen M.D., Ctr. Hospitalier Univ. de Rennes (France) and INSERM (France) and LTSI (France) . . . . . [9786-29]

11:50 am: **Rapid virtual stenting for intracranial aneurysms**, Liang Zhao, Danyang Chen, Zihe Chen, Xiangyu Wang, Nikhil Paliwal, Univ. at Buffalo (USA); Jianping Xiang, Hui Meng, Toshiba Stroke and Vascular Research Ctr. (USA); Jason J. Corso, Jinhui Xu, Univ. at Buffalo (USA) . . . . . [9786-30]

Lunch Break . . . . Mon 12:10 pm to 1:20 pm

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CONFERENCE 9789
PACS and Imaging Informatics: Next Generation and Innovations
Room: San Diego

SESSION 5
Room: San Diego . Mon 10:10 am to 11:50 am

Cloud Computing and Collaborating for Medical Imaging Services and Applications

Session Chair: **Peter R. Bak,** McMaster Univ. (Canada)

10:10 am: **Decentralizing radiology: preparing for the end of fee for service**, Steven C. Horii M.D., Tessa S. Cook M.D., Woojin Kim M.D., The Univ. of Pennsylvania Health System (USA). . . . . [9789-21]

10:30 am: **Toward an open-source semantic data infrastructure for integrating clinical and scientific data in cognition-guided surgery,** Andreas Fetzer, Jasmin Metzger, Deutsches Krebsforschungszentrum (Germany); Darko Katic, Karlsruher Institut für Technologie (Germany); Keno März, Deutsches Krebsforschungszentrum (Germany); Martin Wagner, UniversitätsKlinikum Heidelberg (Germany); Patrick Philipp, Karlsruher Institut für Technologie (Germany); Sandy Engelhardt, Deutsches Krebsforschungszentrum (Germany); Tobias Weller, Karlsruher Institut für Technologie (Germany); Sascha Zelzer, Alfred M. Franz, Deutsches Krebsforschungszentrum (Germany); Maria Maleshkova, Achim Rettinger, Stefanie Speidel, Karlsruher Institut für Technologie (Germany); Ivo Wolf, Hochschule Mannheim (Germany); HannesKenngott, Beat Müller, UniversitätsKlinikum Heidelberg (Germany); Lena Maier-Hein, Hans-Peter Meinzer, Marco Nolden, Deutsches Krebsforschungszentrum (Germany)[9789-22]

10:50 am: **A handheld computer-aided diagnosis systema and simulated analysis,** Ming Jian Su, Xuejun Zhang, Guangxi Univ. (China); Brent J. Liu, The Univ. of Southern California (USA); Kening Su, The First Affiliated Hospital of Guangxi Univ. of Chinese Medicine (China); Ryan Louie, The Univ. of Southern California (USA). . [9789-23]

11:10 am: **Performance management of high-performance computing for medical image processing in Amazon Web Services,** Shunxing Bao, Stephen M. Damon, Bennett A. Landman, Aniruddha Gokhale, Vanderbilt Univ. (USA) . [9789-24]

11:30 am: **Mass classification in mammography with multi-agent based fusion of human and machine intelligence**, Dongdong Xi, Ming Fan, Lihua Li, College of Life Information Science and Instrument Engineering, Hangzhou Dianzi University (China); Juan Zhuang, Zhejiang Cancer Hospital (China); Yanna Shan, Hangzhou First People's Hospital, Hangzhou (China); Gang Dai, Zhejiang Cancer Hospital (China); Bin Zheng, College of Life Information Science and Instrument Engineering, Hangzhou Dianzi University (China) and School of Electrical and Computer Engineering, University of Oklahoma (USA) . . . . . [9789-32]

CONFERENCE 9790
Ultrasonic Imaging and Tomography
Room: Royal Palm One

SESSION 6
Room: Royal Palm One . . . . . Mon 10:10 am to 12:10 pm

Keynote and New Applications of Ultrasound in Medicine and Biology

Session Chairs: **Brian George Anthony,** The Univ. of Texas at Austin (USA); **Neb Duric,** Delphinus Medical Technologies, Inc. (USA)

10:10 am: **Enhanced ultrasound, ultrasound tomography for volume limb imaging and prosthetic fitting** *(Keynote Presentation)*, Brian W. Anthony, Massachusetts Institute of Technology (USA). . . . . [9790-25]

11:10 am: **3D optical imagery for motion compensation in a limb ultrasound system**, Bryan J. Ranger, Micha Feigin, Xiang Zhang, Al Mireault, Ramesh Raskar, Hugh M. Herr, Brian W. Anthony, Massachusetts Institute of Technology (USA) . . . . . [9790-26]

11:30 am: **Quantitative head ultrasound measurements to determine thresholds for preterm neonates requiring interventional therapies following intraventricular hemorrhage**, Jessica Kishimoto, Aaron Fenster, Robarts Research Institute (Canada); Fateme Salehi, Western Univ. (Canada); Walter Romano, David S. C. Lee, St. Thomas Elgin General Hospital (Canada); Sandrine de Ribaupierre, Western Univ. (Canada) . . . . . [9790-27]

11:50 am: **Development and evaluation of a novel targeted, nanoscaled, ultrasound contrast agents**, Houqiang Yu , Huazhong Univ. of Science and Technology (China) . . . . . [9790-28]

Lunch Break . . . . Mon 12:10 pm to 1:20 pm

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POSTER AWARDS SESSION
Room: San Diego . . . . .11:50 to 11:55 am

Poster Award Announcements

The PACS and Imaging Informatics: Next Generation and Innovations conference poster award recipients will be recognized and certificates distributed.

CONFERENCE 9789 ENDS

MONDAY 29 FEBRUARY

CONFERENCE 9783

Physics of Medical Imaging

Room: Town & Country

SESSION 7

Room: Town & Country . . . . . Mon 1:20 to 3:40 pm

CT I: Technology, System Characterization, Applications

Session Chairs: **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany); **Kirsten Boedeker,** Toshiba Medical Research Institute USA, Inc. (USA)

1:20 pm: **Development of a realistic dynamic digital brain phantom for CT perfusion validation**, Sarah E. Divel, Stanford Univ. (USA); W. Paul Segars, Duke Univ. Medical Ctr. (USA); Soren Christensen, Max Wintermark, Maarten G. Lansberg, Stanford Univ. Medical Ctr. (USA); Norbert J. Pelc, Stanford Univ. (USA) . [9783-32]

1:40 pm: **Fluence-field modulated x-ray CT using multiple aperture devices,** Joseph W. Stayman, Aswin J. Mathews, Wojciech Zbijewski, Grace J. Gang, Jeffrey H. Siewerdsen, Satomi Kawamoto, Johns Hopkins Univ. (USA); Ira Blevis, Reuven Levinson, Philips Medical Systems Technologies Ltd. (Israel) . . . . . [9783-33]

2:00 pm: **Accuracy of patient specific organ-dose estimates obtained using an automated image segmentation algorithm,** Taly G. Gilat-Schmidt, Marquette Univ. (USA); Adam S. Wang, Thomas Coradi, Benjamin Haas, Josh M. Star-Lack, Varian Medical Systems, Inc. (USA). . . . . [9783-34]

2:20 pm: **Noise characteristics of CT perfusion imaging: How does noise propagate from source images to final perfusion maps?,** Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison School of Medicine and Public Health (USA) . . . . . [9783-35]

2:40 pm: **Experimental characterization of extra-focal radiation in CT scanners,** Bruce R. Whiting, Univ. of Pittsburgh (USA); Joshua D. Evans, Mariela A. Porras-Chaverri, Jeffrey F. Williamson, Virginia Commonwealth Univ. (USA) . . . . . [9783-36]

3:00 pm: **Dual-source multi-energy CT with triple or quadruple x-ray beams,** Lifeng Yu, Shuai Leng, Cynthia H. McCollough, Mayo Clinic (USA) . . [9783-37]

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CONFERENCE 9785

Computer-Aided Diagnosis

Room: Golden West

SESSION 7

Room: Golden West . . . . . Mon 1:20 to 3:20 pm

Deep Learning II

Session Chairs: **Ronald M. Summers,** National Institutes of Health (USA); **Hayit Greenspan,** Tel Aviv Univ. (Israel)

1:20 pm: **Detection of soft tissue densities from digital breast tomosynthesis: comparison of conventional and deep learning approaches**, Sergei Fotin, Yin Yin, Hrishikesh Haldankar, Jeffrey Hoffmeister M.D., Senthil Periaswamy, iCAD, Inc. (USA). . . . . .[9785-32]

1:40 pm: **Deep learning convolution neural network for computer-aided detection of microcalcifications in digital breast tomosynthesis,** Ravi K. Samala, Heang-Ping Chan, Lubomir M. Hadjiiski, Kenny H. Cha, Mark A. Helvie, Univ. of Michigan (USA). . . . . .[9785-33]

2:00 pm: **Computer aided lung cancer diagnosis with deep learning algorithms,** Wenqing Sun, The Univ. of Texas at El Paso (USA); Bin Zheng, The Univ. of Oklahoma (USA); Wei Qian, The Univ. of Texas at El Paso (USA) . . . . . .[9785-34]

2:20 pm: **Visualizing and enhancing a deep learning framework using patients age and gender for chest x-ray image retrieval,** Yaron Anavi, Ilya Kogan, Elad Gelbart, Ofer Geva, Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . .[9785-35]

2:40 pm: **Deep convolutional neural networks for automatic coronary calcium scoring in a screening study with low-dose chest CT,** Nikolas Lessmann, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands); Arnaud A. A. Setio, Radboud Univ. Medical Ctr. (Netherlands); Bob D. de Vos, Univ. Medical Ctr. Utrecht (Netherlands); Francesco Ciompi, Radboud Univ. Medical Ctr. (Netherlands); Pim A. de Jong, Univ. Medical Ctr. Utrecht (Netherlands); Matthjis Oudkerk, Univ. Medical Ctr. Groningen (Netherlands); Willem P. Th. M. Mali, Max A. Viergever, Univ. Medical Ctr. Utrecht (Netherlands); Bram van Ginneken, Radboud Univ. Medical Ctr. (Netherlands). . . . . .[9785-36]

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CONFERENCE 9786

Image-Guided Procedures, Robotic Interventions, and Modeling

Room: California

SESSION 7

Room: California . . . . . Mon 1:20 to 3:40 pm

Tissue Deformation and Motion

Session Chairs: **Michael I. Miga,** Vanderbilt Univ. (USA); **Pierre Jannin,** Univ. de Rennes 1 (France)

1:20 pm: **Surface-driven biomechanical breast image registration**, Bjoern Eiben, Vasileios Vavourakis, John H. Hipwell, Univ. College London (UK); Sven Kabus, Cristian Lorenz, Thomas Buelow, Philips Research (Germany); David J. Hawkes, Univ. College London (UK) . . . . . .[9786-31]

1:40 pm: **Modeling and simulation of tumor-influenced high-resolution real-time physics-based breast models for model-guided robotic interventions,** John Neylon, Katelyn Hasse, Anand Santhanam, Univ. of California, Los Angeles (USA) . . . . . .[9786-32]

2:00 pm: **Accuracy of lesion boundary tracking in navigated breast tumor excision,** Emily Heffernan, Tamas Ungi M.D., Thomas Vaughan, Padina Pezeshki, Andras Lasso, Evelyn Morin, Gabor Fichtinger, Gabrielle Gauvin, Jay Engel M.D., John Rudan M.D., Queen's Univ. (Canada). . . . . .[9786-33]

2:20 pm: **Diaphragm motion characterization using chest motion data for biomechanics-based lung tumor tracking during EBRT,** Elham Karami, Western Univ. (Canada) and Robarts Research Institute (Canada); Stewart Gaede, Western Univ. (Canada) and London Regional Cancer Program (Canada); Ting-Yim Lee, Western Univ. (Canada) and Robarts Research Institute (Canada) and Lawson Health Research Institute (Canada); Abbas Samani, Western Univ. (Canada) and Robarts Research Institute (Canada) . . . . . .[9786-34]

2:40 pm: **Determination of surgical variables using an android application for a brain shift correction pipeline used in image guided neurosurgery,** Rohan C. Vijayan, Rebekah H. Conley, Logan W. Clements, Reid C. Thompson M.D., Michael I. Miga, Vanderbilt Univ. (USA) . . . . . .[9786-35]

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CONFERENCE 9790

Ultrasonic Imaging and Tomography

Room: Royal Palm One

SESSION 7

Room: Royal Palm One . . . . . Mon 1:20 to 3:40 pm

Transducers and Beamforming

Session Chairs: **Jørgen Arendt Jensen,** Technical Univ. of Denmark (Denmark); **Marko Jakovljevic,** Duke Univ. School of Medicine (USA), Stanford Univ. (USA)

1:20 pm: **A pseudo non-linear method for fast simulations of ultrasonic reverberation,** Brett C. Byram, Jasmine Shu, Vanderbilt Univ. (USA) . .[9790-29]

1:40 pm: **A beamforming method for plane wave Doppler imaging of high flow velocities,** Omar Mansour, Tamie L. Poepping, James C. Lacefield, Robarts Research Institute (Canada) . . . . . .[9790-30]

2:00 pm: **Detection of and compensation for blocked elements using large coherent apertures: ex vivo studies,** Marko Jakovljevic, Nick Bottenus, Lily Kuo, Shalki Kumar, Gregg E. Trahey, Duke Univ. (USA) . . . . . .[9790-31]

2:20 pm: **Real-time 3D image reconstruction of a 24x24 row-column addressing array: from raw data to image,** Chunyu Li, Jiali Yang, Xu Li, Xiaoli Zhong, Junjie Song, Ming Yue Ding, Ming Yuchi, Huazhong Univ. of Science and Technology (China) . . . .[9790-32]

2:40 pm: **Synthetic aperture volumetric ultrasound imaging using 2D row-column addressed transducer array,** Hamed Bouzari, Thomas L. Christiansen, Technical Univ. of Denmark (Denmark); Christopher Beers, Sound Technology, Inc. (USA); Matthias B. Stuart, Technical Univ. of Denmark (Denmark); Svetoslav I. Nikolov, BK Ultrasound (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark). . . . . .[9790-33]

3:00 pm: **Advanced optimization of the synthetic aperture imaging quality for fast ultrasound imaging,** Ramin Moshavegh, Jonas Jensen Sr., Carlos A. Villagomez Hoyos, Matthias B. Stuart, Martin C. Hemmsen Sr., Jørgen A. Jensen, Technical Univ. of Denmark (Denmark). . . . . .[9790-34]

3:20 pm: **Analog gradient beamformer for a portable ultrasound scanner**, Tommaso Di Ianni, Martin C. Hemmsen, Technical Univ. of Denmark (Denmark); Jan Bagge, Henrik Jensen, BK Ultrasound (Denmark); Nitsan Vardi, BK Ultrasound (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . .[9790-35]

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CONFERENCE 9783
Physics of Medical Imaging

Room: Town & Country

SESSION 7 (CONTINUED)
Room: Town & Country . Mon 1:20 to 3:40 pm

3:20 pm: **Optimized projection binning for improved helical amplitude- and phase-based 4DCT reconstruction in the presence of breathing irregularity**, René Werner, Univ. Medical Ctr. Hamburg-Eppendorf (Germany); Christian Hofmann, Siemens Healthcare GmbH (Germany); Tobias Gauer, Univ. Medical Ctr. Hamburg-Eppendorf (Germany) . . . . . .[9783-38]

Coffee Break. . . . Mon 3:40 pm to 4:00 pm

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CONFERENCE 9785
Computer-Aided Diagnosis

Room: Golden West

SESSION 7 (CONTINUED)
Room: Golden West . . . . Mon 1:20 to 3:20 pm

3:00 pm: **Comparison of bladder segmentation using deep-learning convolutional neural network with and without level sets**, Kenny H. Cha, Lubomir M. Hadjiiski, Ravi K. Samala, Heang-Ping Chan, Richard H. Cohan M.D., Elaine M. Caoili, Univ. of Michigan Health System (USA) . . . . . .[9785-37]

Coffee Break. . . . Mon 3:20 pm to 3:50 pm

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: California

SESSION 7 (CONTINUED)
Room: California . . . . . Mon 1:20 to 3:40 pm

3:00 pm: **3D superficial vessel centerlines non-rigid registration**, Filipe M. Marreiros, Linköping Univ. (Sweden) and Ctr. for Medical Image Science and Visualization (Sweden); Chunliang Wang, KTH Royal Institute of Technology (Sweden); Sandro Rossitti, Region Östergötland (Sweden); Örjan Smedby, KTH Royal Institute of Technology (Sweden) . . . . . .[9786-36]

3:20 pm: **A novel craniotomy simulation system for evaluation of stereo-pair reconstruction fidelity and tracking**, Xiaochen Yang, Logan W. Clements, Rebekah H. Conley, Reid C. Thompson M.D., Benoit M. Dawant, Michael I. Miga, Vanderbilt Univ. (USA) . . . . . .[9786-37]

Coffee Break. . . . Mon 3:40 pm to 4:00 pm

9786 continues on page 46

CONFERENCE 9790
Ultrasonic Imaging and Tomography

Room: Royal Palm One

POSTER AWARDS SESSION
Room: Royal Palm One . . .3:40 to 3:45 pm

Poster Award Announcements

The Ultrasonic Imaging and Tomography conference poster award recipients will be recognized and certificates distributed.

Coffee Break. . . . Mon 3:45 pm to 4:00 pm

CONFERENCE 9790 ENDS

BEST STUDENT PAPER AWARD AND PLENARY PRESENTATION

Monday 29 February · 4:00 to 5:15 pm · Location: Town & Country

Conference Chairs: **Steven C. Horii,** The Univ. of Pennsylvania Health System (USA)
Berkman Sahiner, U.S. Food and Drug Administration (USA)

Student Paper Award Announcement

Plenary Presentation:

The Evolution of Medical Imaging from Qualitative to Quantitative: Opportunities, Challenges, and Approaches
Edward F. Jackson,
Univ. of Wisconsin-Madison School of Medicine and Public Health (USA)

TUESDAY 1 MARCH

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 8
Room: Town & Country . . . . . Tue 8:00 am to 9:40 am

Detectors
Session Chairs: **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada); **Karim S. Karim,** Univ. of Waterloo (Canada)

8:00 am: **Improving detector spatial resolution using pixelated scintillators with a barrier rib structure**, Langechuan Liu, Minghui Lu, Wanqing Cao, Luke Peng, Arthur Chen, PerkinElmer, Inc. (USA) . . . . . [9783-39]

8:20 am: **Solid state flat panel Imager with avalanche amorphous selenium**, James R. Scheuermann, Amir H. Goldan, Stony Brook Univ. (USA); Olivier Tousignant, Sébastien Léveillé, Analogic Canada Corp. (Canada); Wei Zhao, Stony Brook Univ. (USA) . . . . . [9783-40]

8:40 am: **The new generation of x-ray detectors: higher DQE and less aliasing with lower exposures**, Tomi Nano, Terenz R. Escartin, Robarts Research Institute (Canada); Karim S. Karim, Univ. of Waterloo (Canada); Ian A. Cunningham, Robarts Research Institute (Canada) . . . . . [9783-41]

9:00 am: **DQE simulation of a-Se x-ray detectors using ARTEMIS**, Yuan Fang, Aldo Badano, U.S. Food and Drug Administration (USA) . . . . . [9783-42]

9:20 am: **High-dynamic range CMOS-based mammography detector for FFDM and DBT**, Inge M. Peters, Chiel Smit, Teledyne DALSA (Netherlands); James J. Miller, Andrey A. Lomako, Teledyne DALSA (Canada) . . . . . [9783-43]

POSTER AWARDS SESSION
Room: Town & Country. . . . . 9:40 to 9:45 am

Poster Award Announcements

The Physics of Medical Imaging conference poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . Tue 9:45 am to 10:10 am

9783 continues on page 47

CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 1
Room: San Diego . . . . . Tue 8:00 am to 9:40 am

Quantitative Image Analysis
Session Chairs: **Marius G. Linguraru,** Children's National Medical Ctr. (USA)

8:00 am: **Multi-voxel algorithm for quantitative bi-exponential MRI T1 estimation**, Piet Bladt, Gwendolyn Van Steenkiste, Gabriel Ramos-Llordén, Arjan den Dekker, Jan Sijbers, Univ. Antwerpen (Belgium).[9784-1]

8:20 am: **Automatic coronary lumen segmentation with partial volume modeling improves hemodynamic significance assessment**, Moti Freiman, Yechiel Lamash, Philips Medical Systems Technologies Ltd. (Israel); Guy Gilboa, Technion-Israel Institute of Technology (Israel); Hannes Nickisch, Sven Prevrhal, Holger Schmitt, Philips Research (Germany); Mani Vembar, Philips Healthcare (USA); Liran Goshen, Philips Medical Systems Technologies Ltd (Israel) . . . . . .[9784-2]

8:40 am: **Contour tracking and probabilistic segmentation of tissue phase mapping MRI**, Teodora Chitiboi, Fraunhofer MEVIS (Germany) and Jacobs Univ. Bremen (Germany); Anja B. Hennemuth, Fraunhofer MEVIS (Germany); Susanne Schnell, Varun Chowdhary, Amir Honarmand, Michael Markl, Northwestern Univ. (USA); Lars Linsen, Jacobs Univ. Bremen gGmbH (Germany); Horst K. Hahn, Fraunhofer MEVIS (Germany) and Jacobs Univ. Bremen (Germany) . . . . . .[9784-3]

9:00 am: **Automatic detection of cardiovascular risk in CT attenuation correction maps in Rb-82 PET/CTs**, Ivana Isgum, Bob D. de Vos, Jelmer M. Wolterink, Univ. Medical Ctr. Utrecht (Netherlands); Damini Dey, Daniel S. Berman, Mathieu Rubeaux, Cedars-Sinai Medical Ctr. (USA); Tim Leiner, Univ. Medical Ctr. Utrecht (Netherlands); Piotr J. Slomka, Cedars-Sinai Medical Ctr. (USA). . . . . .[9784-4]

9:20 am: **Combining the boundary shift integral and tensor-based morphometry for brain atrophy estimation**, Mateusz Michalkiewicz, Akshay Pai, Datalogisk Institut (Denmark); Kelvin Leung, Univ. College London (UK); Stefan Sommer, Sune Darkner, Lauge Sørensen, Jon Sporring, Datalogisk Institut (Denmark); Mads Nielsen, Datalogisk Institut (Denmark) and Biomediq (Denmark). . . . . .[9784-5]

Coffee Break . . . . . Tue 9:40 am to 10:10 am

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 8
Room: Golden West . . . . . Tue 8:00 am to 9:40 am

Lung and Chest II
Session Chairs: **Bram van Ginneken,** Radboud Univ. Medical Ctr. (Netherlands); **Rafael Wiemker,** Philips Research (Germany)

8:00 am: **Pulmonary nodule detection using a cascaded SVM classifier**, Martin Bergtholdt, Philips Technologie GmbH (Germany); Rafael Wiemker, Tobias Klinder, Philips GmbH Innovative Technologies (Germany) . . . . . .[9785-38]

8:20 am: **Spatial context learning approach to automatic segmentation of pleural effusion in chest computed tomography images**, Awais Mansoor, Children's National Medical Ctr. (USA); Rafael Casas Jr., National Institute of Health (USA); Marius G. Linguraru, Children's National Medical Ctr. (USA) . . . . . .[9785-39]

8:40 am: **Lymph node detection in IASLC-defined zones on PET/CT images**, Yihua Song, Jayaram K. Udupa, Dewey Odhner, Drew A. Torigian, Univ. of Pennsylvania (USA) . . . . . .[9785-40]

9:00 am: **Intrapulmonary vascular remodeling: MSCT-based evaluation in COPD and alpha-1 antitrypsin deficient subjects**, Adeline Crosnier, Catalin Fetita, Télécom SudParis (France); Pierre-Yves Brillet, Univ. Paris 13 (France) . . . . . .[9785-41]

9:20 am: **Automatic heart localization and radiographic index computation in chest x-rays**, Sema Candemir, Stefan R. Jaeger, National Library of Medicine (USA); Wilson Lin, Univ. of Maryland, College Park (USA); Zhiyun Xue, Sameer K. Antani, George R. Thoma, National Library of Medicine (USA) . . .[9785-42]

POSTER AWARDS SESSION
Room: Golden West . . . . . Tue 9:40 am to 9:45 am

The Computer-Aided Diagnosis conference poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . Tue 9:45 am to 10:10 am

9785 continues on page 47

CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 8
Room: California . . . . . Tue 8:00 am to 9:40 am

Intraoperative Imaging and Visualization
Session Chairs: **George J. Grevera,** Saint Joseph's Univ. (USA); **Amber L. Simpson,** Memorial Sloan-Kettering Cancer Ctr. (USA)

8:00 am: **Biplane reconstruction and visualization of virtual endoscopic and fluoroscopic views for interventional device navigation**, Martin G. Wagner, Charles M. Strother, Univ. of Wisconsin-Madison (USA); Sebastian Schafer, Siemens Medical Solutions USA, Inc. (USA); Charles A. Mistretta, Univ. of Wisconsin-Madison (USA) . . . . . .[9786-38]

8:20 am: **Visual feedback mounted on surgical tool: proof of concept**, Kaci Carter, Evelyn Morin, Gabor Fichtinger, Thomas Vaughan, Matthew Holden, Gabrielle Gauvin, Padina Pezeshki, Andras Lasso, Tamas Ungi M.D., John Rudan M.D., Jay Engel, Queen's Univ. (Canada) . . . . . .[9786-39]

8:40 am: **CT thermometry for cone-beam CT guided ablation**, Zachary DeStefano, Univ. of California, Irvine (USA); Nadine Abi-Jaoudeh, Ming Li, Bradford J. Wood, Ronald M. Summers, Jianhua Yao, National Institutes of Health (USA) . . . . . .[9786-40]

9:00 am: **A computational model for estimating tumor margins in complementary tactile and 3D ultrasound images**, Arefin M. Shamsil, Canadian Surgical Technologies and Advanced Robotics (Canada) and Western Univ. (Canada); Abelardo M. Escoto, Canadian Surgical Technologies and Advanced Robotics (Canada); Michael D. Naish, Canadian Surgical Technologies and Advanced Robotics (Canada) and Western Univ. (Canada); Rajni V. Patel, Canadian Surgical Technologies and Advanced Robotics (Canada). . . . . .[9786-41]

9:20 am: **Freehand 3D-US reconstruction with robust visual tracking with application to ultrasound-augmented laparoscopy**, Uditha L. Jayarathne, Terry M. Peters, Elvis C. S. Chen, John T. Moore, Robarts Research Institute (Canada) . . . . . .[9786-42]

POSTER AWARDS SESSION
Room: California . . . . . Tue 9:40 am to 9:45 am

The Image-Guided Procedures, Robotic Interventions, and Modeling conference paper and poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . Tue 9:45 am to 10:10 am

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TUESDAY 1 MARCH

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 9
Room: Town & Country . . . . . Tue 10:10 am to 12:10 pm

CT II: Image Reconstruction, Artifact Reduction
Session Chairs: **Joseph W. Stayman,** Johns Hopkins Univ. (USA); **Michael Grass,** Philips Research (Germany)

10:10 am: **An open library of CT patient projection data**, Baiyu Chen, Shuai Leng, Lifeng Yu, David R. Holmes III, Joel G. Fletcher, Cynthia H. McCollough, Mayo Clinic (USA) . . . . . [9783-44]

10:30 am: **A generalized Fourier penalty in prior-image-based reconstruction for cross-platform imaging**, Amir Pourmorteza, National Institutes of Health Clinical Ctr. (USA) and Johns Hopkins Univ. School of Medicine (USA); Jeffrey H. Siewerdsen, Joseph W. Stayman, Johns Hopkins Univ. School of Medicine (USA) . . . . . [9783-45]

10:50 am: **Limits to dose reduction from iterative reconstruction and the effect of through-slice blurring**, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9783-46]

11:10 am: **Compensation (MC) of skull motion and breathing motion in CT using data-based and image-based metrics, respectively**, Herbert K. Bruder, Christopher Rohkohl, Karl Stierstorfer, Thomas G. Flohr, Siemens AG (Germany) . . . . . [9783-47]

11:30 am: **Reduction of truncation artifacts in CT images via a discriminative dictionary representation method**, Yang Chen, Univ. of Wisconsin-Madison (USA) and Southeast Univ. (China); Ke Li, Yinsheng Li, Univ. of Wisconsin-Madison (USA); Jiang Hsieh, GE Healthcare (USA); Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9783-48]

11:50 am: **Reduction of motion artifacts in cardiac CT based on partial angle reconstructions from short scan data**, Juliane Hahn, Deutsches Krebsforschungszentrum (Germany); Herbert K. Bruder, Thomas Allmendinger, Karl Stierstorfer, Thomas Flohr, Siemens Healthcare GmbH (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) . . . . . [9783-49]

Lunch Break . . . . . Tue 12:10 pm to 1:20 pm

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CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 2
Room: San Diego . . . . . Tue 10:10 am to 12:10 pm

Keynote and Diffusion MRI
Session Chair: **Bennett A. Landman,** Vanderbilt Univ. (USA)

10:10 am: **Image processing pipelines: Applications in magnetic resonance histology** *(Keynote Presentation)*, G. Allan Johnson, Robert Anderson, Evan Calabrese, James Cook, Christopher Long, Alexandra Badea, Ctr. for In Vivo Microscopy (USA) . . . . . [9784-6]

11:10 am: **Auto tract: automatic cleaning and tracking of fibers**, Juan Prieto, Francois Budin, Jean Y. Yang, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9784-7]

11:30 am: **Supervised hub-detection for brain connectivity**, Niklas Kasenburg, Univ. of Copenhagen (Denmark); Matthew G. Liptrot, Univ. of Copenhagen (Denmark) and Technical Univ. of Denmark (Denmark); Nina L. Reislev, Ellen Garde, Copenhagen Univ. Hospital Hvidovre (Denmark); Mads Nielsen, Aasa Feragen, Univ. of Copenhagen (Denmark) . . . . . [9784-8]

11:50 am: **Coresets versus clustering: comparison of methods for redundancy reduction in very large white matter fiber sets**, Guy Alexandroni, Gali Zimmerman Moreno, Nir Sochen, Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . [9784-9]

Lunch Break . . . . . Tue 12:10 pm to 1:20 pm

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 9
Room: Golden West . . . . . Tue 10:10 am to 12:10 pm

Head and Neck
Session Chairs: **Khan M. Iftekharuddin,** Old Dominion Univ. (USA); **Fabrice Meriaudeau,** Univ. de Bourgogne (France)

10:10 am: **Comprehensive eye evaluation algorithm**, Carla P. Agurto Rios, Sheila C. Nemeth, Gilberto Zamora, Maria Vahtel, Peter Soliz, Simon Barriga, VisionQuest Biomedical LLC (USA) . . . . . [9785-43]

10:30 am: **Vessel discoloration detection in malaria retinopathy**, Carla P. Agurto Rios, Sheila C. Nemeth, Simon Barriga, Peter Soliz, VisionQuest Biomedical LLC (USA); Ian MacCormick, Univ. of Liverpool (UK); Terrie Taylor, Michigan State Univ. (USA); Simon P. Harding, Univ. of Liverpool (UK); Susan Lewallen, Kilimanjaro Ctr. for Community of Ophthalmology (South Africa); Vinayak Joshi, VisionQuest Biomedical LLC (USA) . . . . [9785-44]

10:50 am: **Computer-aided detection of human cone photoreceptor inner segments using multi-scale circular voting**, Jianfei Liu, National Institutes of Health (USA); Alfredo Dubra, Medical College of Wisconsin (USA); Johnny Tam, National Institutes of Health (USA) . . . . . [9785-45]

11:10 am: **Sweet-spot training for early esophageal cancer detection**, Fons van der Sommen, Svitlana Zinger, Technische Univ. Eindhoven (Netherlands); Erik J. Schoon M.D., Catharina-ziekenhuis (Netherlands); Peter H. N. de With, Technische Univ. Eindhoven (Netherlands) . . . . . [9785-46]

11:30 am: **A single-layer network unsupervised feature learning method for white matter hyperintensity segmentation**, Koen P. T. Vijverberg, Radboud Univ. Nijmegen (Netherlands) and Radboud Univ. Medical Ctr (Netherlands); Mohsen Ghafoorian, Radboud Univ. Nijmegen (Netherlands) and Radboud Univ. Medical Ctr. (Netherlands); Tom Heskes, Radboud Univ. Nijmegen (Netherlands); Bram Platel, Inge van Uden, Frank-Erik de Leeuw, Radboud Univ. Medical Ctr. (Netherlands) . . . . . [9785-47]

11:50 am: **Early esophageal cancer detection using RF classifiers**, Mark H. A. Janse, Fons van der Sommen, Svitlana Zinger, Technische Univ. Eindhoven (Netherlands); Erik J. Schoon M.D., Catharina-ziekenhuis (Netherlands); Peter H. N. de With, Technische Univ. Eindhoven (Netherlands) . . . . . [9785-48]

Lunch Break . . . . . Tue 12:10 pm to 1:20 pm

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 9

Endoscopy/Laparoscopy
Session Chairs: **Eric J. Seibel,** Univ. of Washington (USA); **William E. Higgins,** The Pennsylvania State Univ. (USA)

10:10 am: **Superpixel-based structure classification for laparoscopic surgery**, Sebastian Bodenstedt, Jochen Görtler, Karlsruher Institut für Technologie (Germany); Martin G. Wagner, Hannes Kenngott, UniversitätsKlinikum Heidelberg (Germany); Beat Müller-Stich, Heidelberg School of Medicine (Germany); Rüdiger Dillmann, Stefanie Speidel, Karlsruher Institut für Technologie (Germany) . . . . . [9786-43]

10:30 am: **Tissue classification for laparoscopic image understanding based on multispectral texture analysis**, Yan Zhang, Sebastian J. Wirkert, Justin Iszatt, Deutsches Krebsforschungszentrum (Germany); Hannes Kenngott, Martin G. Wagner, Benjamin Mayer, UniversitätsKlinikum Heidelberg (Germany); Christian Stock, Ruprecht-Karls-Univ. Heidelberg (Germany); Neil T. Clancy, Daniel S. Elson, Imperial College London (UK); Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany). . . . . [9786-44]

10:50 am: **Endoscopic feature tracking for augmented-reality assisted prosthesis selection in mitral valve repair**, Sandy Engelhardt, Silvio Kolb, Deutsches Krebsforschungszentrum (Germany); Raffaele De Simone, UniversitätsKlinikum Heidelberg (Germany); Matthias Karck, Ruprecht-Karls-Univ. Heidelberg (Germany); Hans-Peter Meinzer, Deutsches Krebsforschungszentrum (Germany); Ivo Wolf, Deutsches Krebsforschungszentrum (Germany) and Hochschule Mannheim (Germany) . . . . . [9786-45]

11:10 am: **Method for endobronchial video parsing**, William E. Higgins, The Pennsylvania State Univ. (USA) . . . . . [9786-46]

11:30 am: **Uncalibrated stereo rectification and disparity range stabilization: A comparison of different feature detectors**, Xiongbiao Luo, A. Jonathan McLeod, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9786-47]

11:50 am: **Position-based adjustment of landmark-based correspondence finding in electromagnetic sensor-based colonoscope tracking method**, Masahiro Oda, Hiroaki Kondo, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazuhiro Furukawa M.D., Ryoji Miyahara M.D., Nagoya Univ. Graduate School of Medicine (Japan); Yoshiki Hirooka M.D., Nagoya Univ. Hospital (Japan); Hidemi Goto M.D., Nagoya Univ. Graduate School of Medicine (Japan); Nassir Navab, Technische Univ. München (Germany); Kensaku Mori, Nagoya Univ. (Japan)[9786-48]

Lunch Break . . . . . Tue 12:10 pm to 1:20 pm

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TUESDAY 1 MARCH

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 10
Room: Town & Country. . .Tue 1:20 to 3:00 pm

Photon Counting CT I: Instrumentation

Session Chairs: **Mats Danielsson,** KTH Royal Institute of Technology (Sweden); **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA)

1:20 pm: **Estimation of signal and noise for a whole-body research photon counting CT system**, Zhoubo Li, Shuai Leng, Zhicong Yu, Mayo Clinic (USA); Steffen G. Kappler, Siemens AG (Germany); Cynthia H. McCollough, Mayo Clinic (USA) . . . . . .[9783-50]

1:40 pm: **Material decomposition and virtual non-contrast imaging in photon counting computed tomography: an animal study**, Ralf Gutjahr, Technische Univ. München (Germany) and Siemens Healthcare (Germany); Christoph Polster, Institut für Klinische Radiologie, Ludwig-Maximilians-Univ. Hospital München (Germany) and Siemens Healthcare (Germany); Steffen G. Kappler, Siemens Healthcare (Germany); Hubertus Pietsch, Gregor Jost, Bayer Schering Pharma AG (Germany); Katharina Hahn, Friederike Schöck, Martin Sedlmair, Thomas Allmendinger, Bernhard Schmidt, Bernhard Krauss, Thomas G. Flohr, Siemens Healthcare (Germany). . . . . .[9783-51]

2:00 pm: **On the analogy between pulse-pile-up in energy-sensitive, photon-counting detectors, and level-crossing of shot noise**, Ewald Roessl, Matthias Bartels, Heiner Daerr, Roland M. Proksa, Philips Research (Germany) . . . . .[9783-52]

2:20 pm: **Lossless compression of projection data from photon counting detectors**, Picha Shunhavanich, Norbert J. Pelc, Stanford Univ. (USA) . . . . . .[9783-53]

2:40 pm: **A high-resolution imaging technique using a whole-body research photon counting detector CT system**, Shuai Leng, Zhicong Yu, Mayo Clinic (USA); Ahmed Halaweish, Siemens Healthcare (USA); Steffen G. Kappler, Katharina Hahn, Andre Henning, Siemens Healthcare (Germany); Zhoubo Li, John I. Lane, David L. Levin, Steven M. Jorgensen, Erik L. Ritman, Cynthia H. McCollough, Mayo Clinic (USA) . . . . . .[9783-54]

Coffee Break. . . . . Tue 3:00 pm to 3:30 pm

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CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 3
Room: San Diego . . . Tue 1:20 pm to 3:00 pm

Computational Anatomy

Session Chairs: **Mads Nielsen,** Niels Bohr Institute (Denmark); **Benoit M. Dawant,** Vanderbilt Univ. (USA)

1:20 pm: **Enhanced cortical thickness measurements for rodent brains via Lagrangian-based RK4 streamline computation**, Joohwi Lee, Sun Hyung Kim, Ilwoo Lyu, The Univ. of North Carolina at Chapel Hill (USA); Ipek Oguz, The Univ. of Iowa (USA); Martin A. Styner, The Univ. of Iowa (USA) and The Univ. of North Carolina at Chapel Hill (USA) . . . . [9784-10]

1:40 pm: **Anatomy-aware measurement of segmentation accuracy**, Hamid R. Tizhoosh, Univ. of Waterloo (Canada); Ahmed A. Othman, Suez Canal Univ. (Egypt) . . . . . [9784-11]

2:00 pm: **Automatic segmentation and statistical shape modeling of the paranasal sinuses to estimate natural variations**, Ayushi Sinha, Simon Leonard, Austin Reiter, Johns Hopkins Univ. (USA); Masaru Ishii M.D., Johns Hopkins Bayview Medical Ctr. (USA); Russell H. Taylor, Gregory D. Hager, Johns Hopkins Univ. (USA) . . . . . [9784-12]

2:20 pm: **Combining multi-atlas segmentation with brain surface estimation**, Yuankai Huo, Vanderbilt Univ. (USA); Aaron Carass, Johns Hopkins Univ. (USA); Susan M. Resnick, National Institute on Aging (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA); Jerry L. Prince, Johns Hopkins Univ. (USA); Bennett A. Landman, Vanderbilt Univ. (USA). [9784-13]

2:40 pm: **Automated segmentation of upper digestive tract from abdominal contrast-enhanced CT data using hierarchical statistical modeling of organ inter-relations**, Shunta Hirayama, Yoshito Otake, Nara Institute of Science and Technology (Japan); Toshiyuki Okada, Univ. of Tsukuba (Japan); Masatoshi Hori M.D., Noriyuki Tomiyama M.D., Osaka Univ. (Japan); Yoshinobu Sato, Nara Institute of Science and Technology (Japan). . . . . [9784-14]

Coffee Break. . . . Tue 3:00 pm to 3:30 pm

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 10
Room: Golden West . .Tue 1:20 pm to 3:00 pm

Radiomics II

Session Chairs: **Nico Karssemeijer,** Radboud Univ. Medical Ctr. (Netherlands); **Heang-Ping Chan,** Univ. of Michigan Health System (USA)

1:20 pm: **Applying a radiomics approach to predict prognosis of lung cancer patients**, Nastaran Emaminejad, Shiju Yan, The Univ. of Oklahoma (USA); Wei Qian, The Univ. of Texas at El Paso (USA); Yubao Guan, Guangzhou Medical College (China); Bin Zheng, The Univ. of Oklahoma (USA) . . . . . .[9785-49]

1:40 pm: **Radiomics versus physician assessment for the early prediction of local cancer recurrence after stereotactic radiotherapy for lung cancer**, Sarah A. Mattonen, Western Univ. (Canada) and London Regional Cancer Program (Canada); Carol Johnson, London Regional Cancer Program (Canada); David A. Palma, Western Univ. (Canada) and London Regional Cancer Program (Canada); George Rodrigues, Alexander V. Louie, Western Univ. (Canada); Suresh Senan, Vrije Univ. Medical Ctr. (Netherlands); Timothy P. C. Yeung, Aaron D. Ward, Western Univ. (Canada) and London Regional Cancer Program (Canada) . . . . . .[9785-50]

2:00 pm: **Automatic staging of bladder cancer on CT urography**, Sankeerth S. Garapati, Lubomir M. Hadjiiski, Kenny H. Cha, Heang-Ping Chan, Elaine M. Caoili M.D., Richard H. Cohan M.D., Alon Weizer, Ajjai Alva, Chintana Paramagul, Jun Wei, Chuan Zhou, Univ. of Michigan (USA) . . . . .[9785-51]

2:20 pm: **Signal intensity analysis of ecological defined habitat in soft tissue sarcomas to predict metastasis development**, Hamidreza Farhidzadeh, Univ. of South Florida (USA); Jacob G Scott, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Dmitry B. Goldgof, Lawrence O. Hall, Univ. of South Florida (USA); Robert A. Gatenby, Robert J. Gillies, Meera Raghavan, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) . . . . . .[9785-52]

CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 10
Room: California . . . Tue 1:20 pm to 3:00 pm

Keynote and New Robotic Applications

Session Chairs: **Robert J. Webster III,** Vanderbilt Univ. (USA); **Ziv Yaniv,** National Library of Medicine (USA)

1:20 pm: **Robot-assisted tumor resection: Palpation, incision, debridement, and adhesive closure** *(Keynote Presentation)*, Kenneth Y. Goldberg, Univ. of California, Berkeley (USA); W. Douglas Boyd, Univ. of California, Davis (USA). . . . . .[9786-49]

2:20 pm: **Toward automated cochlear implant insertion using tubular manipulators**, Josephine Granna, Leibniz Univ. Hannover (Germany); Thomas S. Rau, Medizinische Hochschule Hannover (Germany); Thien-Dang Nguyen, Leibniz Univ. Hannover (Germany); Thomas Lenarz, Omid Majdani, Medizinische Hochschule Hannover (Germany); Jessica Burgner-Kahrs, Leibniz Univ. Hannover (Germany) . . . . . .[9786-50]

2:40 pm: **Increasing safety of a robotic system for inner ear surgery using probabilistic error modeling near vital anatomy**, Neal Dillon, Michael A. Siebold, Jason E. Mitchell, J. Michael Fitzpatrick, Robert J. Webster III, Vanderbilt Univ. (USA) . . . . . .[9786-51]

Coffee Break. . . . . Tue 3:00 pm to 3:30 pm

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2:40 pm: **Classification of recurrence free survival nasopharyngeal carcinoma tumors**, Hamidreza Farhidzadeh, Univ. of South Florida (USA); Joo Y Kim, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) and The Royal Australian and New Zealand College of Radiologists (New Zealand); Jacob G. Scott, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Dmitry B. Goldgof, Lawrence O. Hall, Univ. of South Florida (USA); Louis B. Harrison, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) . . . . . .[9785-53]

Coffee Break. . . . . Tue 3:00 pm to 3:30 pm

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 1
Room: Royal Palm One . .Tue 1:20 to 3:00 pm

Novel Imaging Methods

Session Chairs: **Andrzej Krol,** SUNY Upstate Medical Univ. (USA); **Robert C. Molthen,** Medical College of Wisconsin (USA)

1:20 pm: **Alzheimer's disease imaging biomarkers using small-angle x-ray scattering**, Mina Choi, Nadia Halam, Tajdar Warraich, Bahaa Ghammraoui, Aldo Badano, U.S. Food and Drug Administration (USA) . . . . . .[9788-1]

1:40 pm: **Investigation of signal thresholding to reduce the effects of instrument noise of an EMCCD based micro-CT system**, Alexander R. Podgorsak, Sumukh Bysani Krishnakumar, Univ. at Buffalo (USA) and Toshiba Stroke and Vascular Research Ctr. (USA); Swetadri Vasan Setlur Nagesh, Daniel R. Bednarek, Toshiba Stroke and Vascular Research Ctr. (USA); Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Ciprian N. Ionita, Univ. at Buffalo (USA) and Toshiba Stroke and Vascular Research Ctr. (USA) . . . .[9788-2]

2:00 pm: **High-resolution dynamic speech imaging with joint low-rank and atlas-driven sparsity constraints**, Maojing Fu, Univ. of Illinois at Urbana-Champaign (USA); Jonghye Woo, Ctr. for Advanced Medical Imaging Sciences, Massachusetts Genral Hospital (USA); Zhi-Pei Liang, Bradley P. Sutton, Univ. of Illinois at Urbana-Champaign (USA) . . . . .[9788-3]

2:20 pm: **Design and evaluation of a grid reciprocation scheme for use in digital breast tomosynthesis**, Tushita Patel, Helen Sporkin, Heather Peppard, Mark B. Williams, Univ. of Virginia (USA). . .[9788-4]

2:40 pm: **Performance modeling of a wearable Brain PET (BET) camera**, Charles R. Schmidtlein, Memorial Sloan-Kettering Cancer Ctr. (USA); James N. Turner, Binghamton Univ. (USA); Michael O. Thompson, Cornell Univ. (USA); Krishna C. Mandal, Univ. of South Carolina (USA); Jiahan Zhang, Syracuse Univ. (USA); John L. Humm, Memorial Sloan-Kettering Cancer Ctr. (USA); David H. Feiglin, Andrzej Krol, SUNY Upstate Medical Univ. (USA). . . . . .[9788-5]

Coffee Break. . . . . Tue 3:00 pm to 3:30 pm

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TUESDAY 1 MARCH

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 11
Room: Town & Country . . Tue 3:30 to 4:50 pm

PET and MR

Session Chairs: **Jinyi Qi,** Univ. of California, Davis (USA); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany)

3:30 pm: **Short term reproduciblity of a high contrast 3D isotropic optic nerve imaging sequence in healthy controls**, Robert L. Harrigan, Alex K. Smith, Seth A. Smith, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9783-55]

3:50 pm: **Crystal timing offset calibration method for time of flight PET scanners**, Jinghan Ye, Xiyun Song, Philips Healthcare (USA) . . . . . .[9783-56]

4:10 pm: **Solving outside-axial-field-of-view scatter correction problem in PET via digital experimentation**, Andriy Andreyev, Yang-Ming Zhu, Jinghan Ye, Xiyun Song, Zhiqiang Hu, Philips Healthcare (USA) . . . . . .[9783-57]

4:30 pm: **Initial experience in primal-dual optimization reconstruction from PET patient data**, Zheng Zhang, The Univ. of Chicago Medical Ctr. (USA); Jinghan Ye, Philips Healthcare (USA); Buxin Chen, The Univ. of Chicago Medical Ctr. (USA); Amy Perkins, Philips Healthcare (USA); Chien-Min Kao, Emil Y. Sidky, Xiaochuan Pan, The Univ. of Chicago Medical Ctr. (USA) . . . . .[9783-58]

WORKSHOP
NIH Funding Opportunities: Navigating the System and Tips for Applicants
Room: Town & Country
Tue 5:00 pm to 7:00 pm
Workshop Chair:
Antonio Sastre,
National Institute of Biomedical Imaging and Bioengineering (USA)
See Special Events for additional information.

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CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 4
Room: San Diego . . . Tue 3:30 pm to 4:50 pm

Segmentation: Brain

Session Chairs: **Miguel Angel González Ballester,** Univ. Pompeu Fabra (Spain); **Ivana Isgum,** Univ. Medical Ctr. Utrecht (Netherlands)

3:30 pm: **Segmentation and labeling of the ventricular system in normal pressure hydrocephalus using patch-based tissue classification and multi-atlas labeling**, Lotta M. Ellingsen, Univ. of Iceland (Iceland) and Johns Hopkins Univ. (USA); Snehashis Roy, Henry M. Jackson Foundation (USA); Aaron Carass, Ari M. Blitz, Johns Hopkins Univ. (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA); Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9784-15]

3:50 pm: **Generation and evaluation of an ultra-high-field atlas with applications in DBS planning**, Brian T. Wang, Western Univ. (Canada) and Robarts Research Institute (Canada); Stefan Poirier, Western Univ. (Canada) and Robarts Research Institute (Canada); Ting Guo, The Hospital for Sick Children (SickKids) (Canada); Terry M. Peters, Ali R. Khan, Western Univ. (Canada) and Robarts Research Institute (Canada). . . . . [9784-16]

4:10 pm: **The bumps on the hippocampus**, Yi Gao, Stony Brook Univ. (USA); Lawrence Ver Hoef, The Univ. of Alabama at Birmingham (USA). . . [9784-17]

4:30 pm: **Unsupervised fetal cortical surface parcellation**, Sonia Dahdouh, Catherine Limperopoulos, Children's National Medical Ctr. (USA) . . . . . [9784-18]

WORKSHOP
Image Synthesis
Room: San Diego · Tue 5:00 pm to 7:00 pm
Workshop Chair:
Jerry L. Prince,
Johns Hopkins Univ., (USA)
Sebastien Ourselin,
Univ. College London (United Kingdom)
See Special Events for additional information.

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CONFERENCE 9785
Computer-Aided Diagnosis
Room: Golden West

SESSION 11
Room: Golden West . Tue 3:30 to 4:50 pm

SPIE-AAPM-NCI PANEL DISCUSSION:
CAD Grand Challenges: Paving the Way for Imaging in the Era of Precision Medicine

Moderator: **Samuel G. Armato III**, The Univ. of Chicago, (USA)

Panelists: **Maryellen Giger,** The Univ. of Chicago, (USA); **Ronald M. Summers,** National Institutes of Health, (USA); **Joel H. Saltz,** Stony Brook Univ.,(USA); **Fabrice Meriaudeau,** Univ. de Bourgogne, (France);**Hugo Aerts,** Dana-Farber Cancer Institute, (USA)

As part of the 2016 SPIE Medical Imaging Symposium, the CAD Conference will host a panel discussion to explore current imaging challenges that are worthy of becoming the subject of a future CAD Grand Challenge. The successful LUNGx Challenge that was held in conjunction with the 2015 SPIE Medical Imaging Symposium (Armato, et al., Journal of Medical Imaging, 2015) involved quantitative image analysis methods (radiomics) for the classification of malignant and benign lung nodules on thoracic CT scans – an important and clinically significant issue, but one that has been under investigation for decades. This panel discussion will encourage attendees to think about the next generation of radiologic tasks that should be advanced through the commitment of a Grand Challenge. The panel also will touch on the technical requirements necessary to develop an open-source informatics infrastructure for the support of grand challenges and the evaluation of clinical support systems.

WORKSHOP
Live Demonstrations
Room: Grand Exhibit Hall
Tue 5:00 pm to 7:00 pm
Workshop Chairs:
Dr. Heang-Ping Chan,
Univ. of Michigan Health System, (USA)
Dr. Horst Hahn,
Fraunhofer MEVIS, (Germany)
See Special Events for additional information.

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CONFERENCE 9786
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 11
Room: California . . . .Tue 3:30 pm to 4:50 pm

Prostate Procedures

Session Chairs: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Frank Sauer,** Siemens Corp., Corporate Technology (USA)

3:30 pm: **A comparison of needle tip localization accuracy using 2D and 3D-guided ultrasound for high-dose-rate prostate brachytherapy treatment planning**, W. Thomas Hrinivich, Western Univ. (Canada); Douglas A. Hoover, Western Univ. (Canada) and London Regional Cancer Program (Canada); Kathleen Surry, Western Univ. (Canada); Chandima Edirisinghe, Jacques Montreuil, Robarts Research Institute (Canada); David D'Souza, Western Univ. (Canada) and London Regional Cancer Program (Canada); Aaron Fenster, Western Univ. (Canada) and Robarts Research Institute (Canada); Eugene Wong, Western Univ. (Canada) and London Regional Cancer Program (Canada) and Robarts Research Institute (Canada) . . . . . .[9786-52]

3:50 pm: **An MRI guided system for prostate laser ablation with treatment planning and multi-planar temperature monitoring**, Sheng Xu, National Institutes of Health (USA); Harsh Agarwal, Philips Research (USA); Marcelino Bernardo, Baris Turkbey, National Institutes of Health (USA); Ari Partanen, Philips Healthcare (USA); Ayele Negussie, National Institutes of Health (USA); Neil Glossop, Traxtal Technologies (Canada); Peter Choyke, Peter Pinto, Bradford J. Wood, National Institutes of Health (USA) . . . . . .[9786-53]

4:10 pm: **How does prostate biopsy guidance error impact pathologic cancer risk assessment?**, Peter R. Martin, Mena Gaed, José A. Gómez, Madeleine Moussa, Western Univ. (Canada); Eli Gibson, Univ. College London (UK) and Radboud Univ. Medical Ctr. (Netherlands); Derek W. Cool, Joseph L. Chin, Stephen Pautler, Aaron Fenster, Aaron D. Ward, Western Univ. (Canada) . . . . . .[9786-54]

4:30 pm: **Impact of contouring variability on focal therapy coverage assessment**, Eli D. Gibson, Univ. College London (UK) and Radboud Univ. Medical Ctr. (Netherlands); Ian A. Donaldson, Taimur T. Shah, Univ. College London (UK); Yipeng Hu, Radboud Univ. Medical Ctr. (Netherlands); Hashim Ahmed, Dean Barratt, Univ. College London (UK)[9786-55

CONFERENCE 9786 ENDS

CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 2
Room: Royal Palm One . .Tue 3:30 to 4:50 pm

Innovations in Image Processing

Session Chairs: **Armando Manduca,** Mayo Clinic (USA); **Robert C. Molthen,** Medical College of Wisconsin (USA)

3:30 pm: **3D choroid neovascularization growth prediction based on reaction-diffusion model**, Shuxia Zhu, Xinjian Chen, Dehui Xiang, Fei Shi, Soochow Univ. (China); Haoyu Chen, Shantou Univ. (China) . . . . . .[9788-6]

3:50 pm: **Automatic classification of endoscopic images for premalignant conditions of the esophagus**, Davide Boschetto, IMT Institute for Advanced Studies Lucca (Italy) and Univ. degli Studi di Padova (Italy); Gloria Gambaretto, Enrico Grisan, Univ. degli Studi di Padova (Italy) . . . . . .[9788-7]

4:10 pm: **Automatic classification for CLE of small bowel mucosa alterations in celiac disease**, Davide Boschetto, IMT Institute for Advanced Studies Lucca (Italy) and Univ. degli Studi di Padova (Italy); Gianluca Di Claudio, Univ. degli Studi di Padova (Italy); Hadis Mirzaei, Rupert W. L. Leong, The Univ. of New South Wales (Australia); Enrico Grisan, Univ. degli Studi di Padova (Italy) . . . . . .[9788-8]

4:30 pm: **Non-rigid estimation of cell motion in calcium time-lapse images**, Siham Hachi, Edinson Lucumi Moreno, Luxembourg Ctr. for Systems Biomedicine (Luxembourg); An-Sofie Desmet, Pieter Vanden Berghe, KU Leuven (Belgium); Ronan M. T. Fleming, Luxembourg Ctr. for Systems Biomedicine (Luxembourg) . . . . . .[9788-9]

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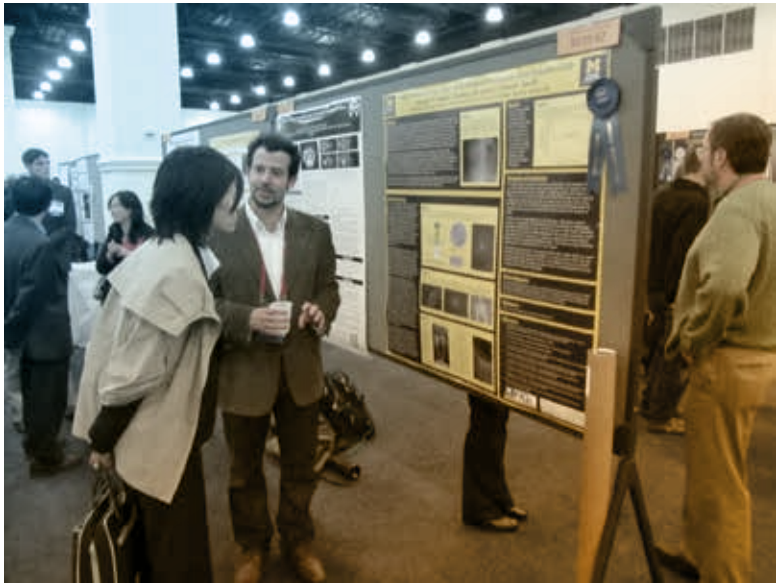
CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment

WORKSHOP
Validation of Medical Image-Perception Models
Room: California · Tue 5:00 to 7:00 pm
Workshop Chairs:
Craig K. Abbey, Matthew A. Kupinski,
College of Optical Sciences,
The Univ. of Arizona, (USA)
See Special Events for additional information.

Participate in the Poster Sessions

Gain valuable feedback and one-on-one networking with colleagues.



TUESDAY/WEDNESDAY POSTERS

Location: Grand Exhibit Hall

Posters will be on display Tuesday and Wednesday with extended viewing until 9:00 pm on Tuesday. The interactive poster session with authors in attendance will be Wednesday evening from 5:30 to 7:00 pm. Award winners will be identified with ribbons during the reception. Award announcement times are listed in the conference schedule.

POSTER AUTHORS:

- Display your poster early on Tuesday for extended viewing and consideration for a poster award.
- Poster boards will be available at morning coffee break on Tuesday.
- Posters not displayed at the beginning of the interactive poster session and reception will be considered a no show.
- Stand with your poster during the interactive poster session and reception from 5:30 to 7:00 pm on Wednesday.
- Authors should remove their poster after the interactive poster session on Wednesday.
- Posters remaining on the boards after the reception will be discarded.

CONFERENCE 9784

Image Processing

Classification and Machine Learning

Mutual information criterion for feature selection with application to classification of breast microcalcifications, Idit Diamant, Tel Aviv Univ. (Israel); Jacob Goldberger, Bar-Ilan Univ. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . [9784-63]

Single trial classification for the categories of perceived emotional facial expressions: an event-related fMRI study, Sutao Song, Univ. of Jinan (China); Yuxia Huang, Zhiying Long, Beijing Normal Univ. (China); Gongxiang Chen, Jinan Univ. (China) . . . . . [9784-64]

Template-based automatic extraction of the joint space of foot bones from CT scan, Eunbi Park, Taeho Kim, Jinah Park, KAIST (Korea, Republic of) . . . . . [9784-65]

Tissue classification of large-scale multi-site MR data using fuzzy k-nearest neighbor method, Ali Ghayoor, The Univ. of Iowa (USA); Jane S. Paulsen, Regina E. Y. Kim, The Univ. of Iowa Carver College of Medicine (USA); Hans J. Johnson, The Univ. of Iowa (USA) . . . . . [9784-66]

Texture analysis for survival prediction of pancreatic ductal adenocarcinoma patients with neoadjuvant chemotherapy, Jayasree Chakraborty, Liana Langdon-Embry, Joanna G. Escalon M.D., Peter J. Allen M.D., Maeve A. Lowery M.D., Eileen M. O'Reilly M.D., Richard K. Do M.D., Amber L. Simpson, Memorial Sloan-Kettering Cancer Ctr. (USA) . . . . . [9784-67]

Learning-based landmarks detection for osteoporosis analysis, Erkang Cheng, Broncus Medical, Inc. (USA); Ling Zhu, Shanghai Jiao Tong Univ. School of Medicine (China); Jie Yang, Temple Univ. (USA); Azhari Azhari, Suhardjo Sitam, Univ. Padjadjaran (Indonesia); Xin Liang, Dalian Medical Univ. (China); Haibin Ling, Temple Univ. (USA). . . . . [9784-68]

2D image classification for 3D anatomy localization: employing deep convolutional neural networks, Bob D. De Vos, Jelmer M. Wolterink, Pim A. de Jong, Max A. Viergever, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands). . . . . [9784-69]

Neural network-based visual body weight estimation for drug dosage finding, Christian Pfitzner, Stefan May, Technische Hochschule Nürnberg Georg Simon Ohm (Germany); Andreas Nüchter, Julius-Maximilians-Univ. Würzburg (Germany) . . . . . [9784-70]

Localization of skeletal and aortic landmarks in trauma CT data based on the discriminative generalized Hough transform, Cristian Lorenz, Eberhard Hansis, Philips Research (Germany); Jürgen Weese, Philips Technologie GmbH (Germany); Heike Carolus, Philips Research (Germany) . . . . . [9784-71]

Supervised novelty detection in brain tissue classification, with an application to white matter hyperintensities, Hugo J. Kuijf, Image Sciences Institute (Netherlands) and Univ. Medical Ctr. Utrecht (Netherlands); Pim Moeskops, Bob D. de Vos, Image Sciences Institute, Univ. Medical Ctr. Utrecht (Netherlands); Willem Bouvy, Jeroen de Bresser, Geert Jan Biessels, Max A. Viergever, Univ. Medical Ctr. Utrecht (Netherlands); Koen L. Vincken, Image Sciences Institute (Netherlands). . . . . [9784-72]

A bayesian framework for early risk prediction in traumatic brain injury, Shikha Chaganti, Andrew J. Plassard, Vanderbilt Univ. (USA); Laura Wilson, Miya A. Smith, Mayur B. Patel, Vanderbilt Univ. Medical Ctr. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9784-73]

HT-BONE: A graphical user interface for the identification of bone profiles in CT images via extended Hough transform, Anna Maria Massone, Istituto dei Materiali per l Elettronica ed il Magnetismo (Italy); Cristina Campi, Annalisa Perasso, Consiglio Nazionale delle Ricerche (Italy); Mauro C. Beltrametti, Univ. degli Studi di Genova (Italy); Gianmario Sambuceti, IRCCS San Martino-IST (Italy) and Univ. degli Studi di Genova (Italy); Michele Piana, Univ. degli Studi di Genova (Italy) and CNR-SPIN (Italy) . . . . . [9784-74]

GBM heterogeneity characterization by radiomic analysis of phenotype anatomical planes, Ahmad Chaddad, Christian Desrosiers, Matthew Toews, École de Technologie Supérieure (Canada) . . . . . [9784-75]

A framework for classification and segmentation of branch retinal artery occlusion in SD-OCT, Jingyun Guo, Fei Shi, Weifang Zhu, Soochow Univ. (China); Haoyu CHen, Shantou Univ. (China); Xinjian Chen, Soochow Univ. (China). . . . [9784-76]

Segmentation techniques evaluation based on a single compact breast mass classification scheme, Bruno R. Matheus, Karem D. Marcomini, Homero Schiabel, Univ. de São Paulo (Brazil) . . . . . [9784-77]

Capturing population based patient-specific characters for prostate segmentation on 3D CT images, Baowei Fei, Emory Univ. (USA); Ling Ma, Emory Univ. (USA) and Beijing Institute of Technology (China); Rongrong Guo, Zhiqiang Tian, Emory Univ. (USA); Rajesh Venkataraman, Saradwata Sarkar, Eigen Inc. (USA); Xiabi Liu, Beijing Institute of Technology (China); Funmilayo Tade, David M. Schuster, Emory Univ. (USA) . [9784-78]

Patch Forest: when random forest meets patch-based segmentation, Zhongliu Xie, Duncan F. Gillies, Imperial College London (UK) . . . . . [9784-79]

Automated detection of retinal landmarks for the identification of clinically relevant regions in fundus photography, Giovanni Ometto, Aarhus Univ. Hospital (Denmark); Francesco Calivà, Univ. of Lincoln (UK); Toke Bek, Aarhus Univ. Hospital (Denmark); Andrew Hunter, Univ. of Lincoln (UK) . . . . [9784-80]

Automatic basal slice detection for cardiac analysis, Mahsa Paknezhad, National Univ. of Singapore (Singapore); Stephanie Marchesseau, A*STAR-NUS Clinical Imaging Research Ctr. (Singapore); Michael S. Brown, National Univ. of Singapore (Singapore) . . . . . [9784-81]

Segmentation

Guidewire path tracking and segmentation in 2D fluoroscopic time series using device paths from previous frames, Martin G. Wagner, Charles M. Strother, Charles A. Mistretta, Univ. of Wisconsin-Madison (USA) . . . . . [9784-82]

Diseased pancreas segmentation, Konstantin Dmitriev, Ievgeniia Gutenko, Saad Nadeem, Arie Kaufman, Stony Brook Univ. (USA) . . . . . [9784-83]

Fast global interactive volume segmentation with regional supervoxel descriptors, Imanol Luengo, The Univ. of Nottingham (UK); Mark Basham, Diamond Light Source Ltd. (UK); Andrew P. French, The Univ. of Nottingham (UK) . . . [9784-84]

Unsupervised 3D renal segmentation based on image partitioning, Varduhi Yeghiazaryan, Irina Voiculescu, Univ. of Oxford (UK). . . . . [9784-85]

3D Transrectal Ultrasound (TRUS) prostate segmentation based on optimal feature learning framework, Xiaofeng Yang, Peter J. Rossi, Ashesh B. Jani, Hui Mao, Tomi Ogunleye, Walter J. Curran, Tian Liu, Emory Univ. (USA). . . . . [9784-86]

Accurate airway segmentation based on intensity structure analysis and graph-cut, Qier Meng, Takayuki Kitsaka, Yukitaka Nimura, Masahiro Oda, Kensaku Mori, Nagoya Univ. (Japan) . . . . . [9784-87]

Random-forest-classification of large volume structures for visuo-haptic rendering in CT images, Andre Mastmeyer, Dirk Fortmeier, Heinz Handels, Univ. zu Lübeck (Germany) . . . . .[9784-88]

Active appearance model and deep learning for more accurate prostate segmentation on MRI, Ruida Cheng, Holger R. Roth, Le Lu, Shijun Wang, Baris Turkbey, William Gandler, Evan S. McCreedy, Harsh Agarwal, Peter Choyke, Ronald M. Summers, Matthew McAuliffe, National Institutes of Health (USA) . . . . . .[9784-89]

Automated segmentation of MS lesions in FLAIR, DIR and T2-w MR images via an information theoretic approach, Sunanda D. Mitra, Jason E. Hill, Kevin Matlock, Ranadip Pal, Brian Nutter, Texas Tech Univ. (USA) . . . . . .[9784-90]

Lung vessel segmentation in CT images using graph cuts, Zhiwei Zhai, Marius Staring, Berend C. Stoel, Leiden Univ. Medical Ctr. (Netherlands) . . . . . .[9784-91]

Enhancing a diffusion algorithm for 4D image segmentation using local information, Philipp Lösel, Vincent Heuveline, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . .[9784-92]

Precise renal artery segmentation for estimation of renal vascular dominant regions, Chenglong Wang, Mitsuru Kagajo, Nagoya Univ. Graduate School of Information Science (Japan); Yoshihiko Nakamura, Tomakomai National College of Technology (Japan); Masahiro Oda, Nagoya Univ. Graduate School of Information Science (Japan); Yasushi Yoshino, Tokunori Yamamoto, Nagoya Univ. Graduate School of Medicine (Japan); Kensaku Mori, Nagoya Univ. Information and Communications HQ (Japan). . . . . .[9784-93]

An SPM12 extension for multiple sclerosis lesion segmentation, Eloy Roura, Arnau Oliver, Univ. de Girona (Spain); Mariano Cabezas, Univ. de Girona (Spain) and Hospital Univ. Vall d'Hebron (Spain); Sergi Valverde, Univ. de Girona (Spain); Deborah Pareto, Hospital Univ. Vall d'Hebron (Spain); Joan C. Vilanova, Clínica Girona (Spain); Lluís Ramió-Torrentà, Hospital Univ. de Girona (Spain); Àlex Rovira, Hospital Univ. Vall d'Hebron (Spain); Xavier Lladó, Univ. de Girona (Spain) . . . . . .[9784-94]

A neural network approach to lung nodule segmentation, Yaoxiu Hu, SYSU-CMU Joint Institute of Engineering (China); Prahlad G. Menon, Duquesne Univ. (USA) . . . . . .[9784-95]

Loosely coupled level sets for retinal layers and drusen segmentation in subjects with dry age-related macular degeneration, Jelena Novosel, Rotterdam Ophthalmic Institute (Netherlands) and Technische Univ. Delft (Netherlands); Ziyuan Wang, Technische Univ. Delft (Netherlands); Henk de Jong, Koenraad A. Vermeer, Rotterdam Ophthalmic Institute (Netherlands); Lucas J. van Vliet, Technische Univ. Delft (Netherlands) . . . . . .[9784-96]

Self-correcting multi-atlas segmentation, Yi Gao, Stony Brook Univ. (USA); Andrew Wilford, McGill Univ. (Canada); Liang Guo, The Ohio State Univ. (USA) . . . . . .[9784-97]

Improving cerebellar segmentation with statistical fusion, Andrew J. Plassard, Vanderbilt Univ. (USA); Zhen Yang, Johns Hopkins Univ. (USA); Swati Rane, Univ. of Washington (USA); Jerry L. Prince, Johns Hopkins Univ. (USA); Daniel O. Claassen, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9784-98]

Automatic brain tumor segmentation with a fast Mumford-Shah algorithm, Sabine Müller, Joachim Weickert, Univ. des Saarlandes (Germany); Norbert Graf, Universitätsklinikum des Saarlandes (Germany) . . . . . .[9784-99]

Cellular image segmentation using n-agent cooperative game theory, Ian Dimock, Justin W. L. Wan, Univ. of Waterloo (Canada) . . . . . .[9784-100]

Cochlea segmentation using iterated random walks with shape prior, Esmeralda Ruiz Pujadas, Univ. Pompeu Fabra (Spain); Hans M. Kjer, Technical Univ. of Denmark (Denmark); Sergio Vera, Alma IT Systems (Spain); Mario Ceresa, Univ. Pompeu Fabra (Spain); Miguel Angel González Ballester, Univ. Pompeu Fabra (Spain) and Institució Catalana de Recerca i Estudis Avançats (Spain) . . . . . [9784-101]

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An image registration pipeline for analysis of transynaptic tracing in mice, Kwame S. Kutten, Stephen M. Eacker, Valina L. Dawson, Ted L. Dawson M.D., J. Tilak Ratnanather, Michael I. Miller, Johns Hopkins Univ. (USA) . . . . . [9788-74]

Comparison of stroke infarction between CT perfusion and diffusion weighted imaging: preliminary results, Ashrani Aizzuddin Abd. Rahni, Israna Houssain Arka, Kalaivani Chellappan, Shahizon Azura Mukari, Zhe Kang Law, Univ. Kebangsaan Malaysia (Malaysia); Ramesh Sahathevan, Univ. Kebangsaan Malaysia (Malaysia), Calvary Hospital (Australia) . . . . . [9788-75]

High-resolution in vivo Wistar rodent brain atlas based on T1 weighted Image, Su Huang, Zhongkang Lu, Weimin Huang, Institute for Infocomm Research (Singapore); Boominathan Ramasamy, Sankar Seramani, Singapore Bioimaging Consortium (Singapore); Cuntai Guan, Institute for Infocomm Research (Singapore); Sakthivel Sekar, Kishore Bhakoo, Singapore Bioimaging Consortium (Singapore) . . . . . [9788-106]

fMRI

Investigating the relationship between subjective drug craving and temporal dynamics of the default mode network, executive control network, and salience network in methamphetamine dependents using rsfMRI, Somayyeh Soltanian-Zadeh, Univ. of Tehran (Iran, Islamic Republic of) and Duke Univ. (USA); Gholam-Ali Hossein-Zadeh, Univ. of Tehran (Iran, Islamic Republic of) and Institute for Studies in Theoretical Physics and Mathematics (Iran, Islamic Republic of); Alireza Shahbabaie, Tehran Univ. of Medical Sciences (Iran, Islamic Republic of) and Institute for Cognitive Science Studies (Iran, Islamic Republic of); Hamed Ekhtiari, Tehran Univ. of Medical Sciences (Iran, Islamic Republic of) and Institute for Cognitive Sciences Studies (Iran, Islamic Republic of). . . . . [9788-76]

Functional connectivity analysis of resting-state fMRI networks in nicotine dependent patients, Aria Smith, Anahid Ehtemami, Daniel Fratte, Anke Meyer-Baese, Olmo Zavala-Romero, Florida State Univ. (USA) . . . . . [9788-78]

Optical

FEM-based simulation of a fluorescence tomography experiment using anatomical MR images, Wuwei Ren, Andreas Elmer, Mark-Aurel Augath, Markus Rudin, ETH Zürich (Switzerland) . [9788-79]

Measuring skin penetration by confocal Raman microscopy (CRM): correlation to results from conventional expermients, Dominique Lunter, Eberhard Karls Univ. Tübingen (Germany). .[9788-80]

Improve axial resolution of ultrasound-switchable fluorescence technique for deep-tissue high-resolution fluorescence imaging, Baohong Yuan, Jayanth Kandukuri, Bingbing Cheng, Shuai Yu, The Univ. of Texas at Arlington (USA); Venugopal Bandi, Univ. of North Texas (USA); Kytai T. Nguyen, Yi Hong, The Univ. of Texas at Arlington (USA); Francis D'Souza, Univ. of North Texas (USA). . . . . [9788-82]

Nanoscale donor-acceptor labelled liposome contrast agent for ultrasound modulated fluorescence tomography, Qimei Zhang, Stephen P. Morgan, The Univ. of Nottingham (UK); Melissa L. Mather, Keele Univ. (UK) . . . . . [9788-83]

3D registration of intravascular optical coherence tomography and cryo-image volumes for microscopic-resolution validation, David Prabhu, Case Western Reserve Univ. (USA); Emile Mehanna, Univ. Hospitals Case Medical Ctr. (USA); Madhusudhana Gargesha, Case Western Reserve Univ. (USA); Eric Brandt, Nienke van Ditzhuijzen, Daniel Chamie, Yamamoto Hirosada, Yusuke Fujino, Ali Farmazilian, Univ. Hospitals Case Medical Ctr. (USA); Jaymin Patel, Case Western Reserve Univ. (USA); Marco Costa M.D., Hiram G. Bezerra, Univ. Hospitals Case Medical Ctr. (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9788-104]

Fluids and Cardiovascular

Respiratory-gated electrical impedance tomography: a potential technique for quantifying stroke volume, Saaid H. Arshad, Ethan K. Murphy, Ryan J. Halter, Thayer School of Engineering at Dartmouth (USA) . . . . . [9788-84]

An efficient method for accurate segmentation of left ventricle in contrast-enhanced cardiac MRI images, Venkata Suryanarayana K, Abhishek Mitra, Srikrishnan Viswanathan, Samsung R&D Institute India - Bangalore (India); Hyun Hee Jo, Anup Bidesi, SAMSUNG Electronics Co., Ltd. (Korea, Republic of). . . . [9788-85]

Comparison of quantitative myocardial perfusion imaging CT to fluorescent microsphere-based flow from high-resolution cryo-images, Brendan L. Eck, Rachid Fahmi, Jacob Levi, Case Western Reserve Univ. (USA); Anas Fares M.D., Univ. Hospitals of Cleveland (USA); Hao Wu, Yuemeng Li, Case Western Reserve Univ. (USA); Mani Vembar, Amar C. Dhanantwari, Philips Healthcare (USA); Hiram G. Bezerra, Univ. Hospitals Case Medical Ctr. (USA); David L. Wilson, Case Western Reserve Univ. (USA). . . . [9788-86]

Nonrigid 2D registration of fluoroscopic coronary artery image sequence with layered motion, Taewoo Park, Hankuk Univ. of Foreign Studies (Korea, Republic of). . . . . [9788-87]

Sensitivity evaluation of DSA-based parametric imaging using Doppler ultrasound in neurovascular phantoms, Anusha Balasubramoniam, Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA) . . . . . [9788-88]

Effect of beam hardening on transmural myocardial perfusion quantification in myocardial CT imaging, Rachid Fahmi, Brendan L. Eck, Jacob Levi, Case Western Reserve Univ. (USA); Anas Fares, Univ. Hospitals Case Medical Ctr. (USA); Hao Wu, Case Western Reserve Univ. (USA); Mani Vembar, Amar C. Dhanantwari, Philips Healthcare (USA); Hiram G. Bezerra, Univ. Hospitals Case Medical Ctr. (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9788-89]

Investigating relationships between left atrial volume, symmetry, and sphericity, Prahlad G. Menon, Duquesne Univ. (USA) and Univ. of Pittsburgh (USA) and The Univ. of Texas at San Antonio (USA); Sotiris Nedios, Gerhard Hindricks, Andreas Bollmann, Univ. Hospital Leipzig (Germany) . . . . . [9788-90]

Cancer Imaging

CT guided diffuse optical tomography for breast cancer imaging, Reheman Baikejiang, Wei Zhang, Dianwen Zhu, Changqing Li, Univ. of California, Merced (USA) . . . . . [9788-91]

Microscopic validation of whole mouse micro-metastatic tumor imaging agents using cryo-imaging and sliding organ image registration, Yiqiao Liu, Bo Zhou, Mohammed Q. Qutaish, David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9788-93]

Computerized segmentation algorithm with personalized atlases of murine MRIs in a SV40 large T antigen mouse mammary cancer model, Adam Sibley, Maryellen L. Giger, The Univ. of Chicago (USA) . . . . . [9788-95]

The 3D edgerunner pipeline: a novel shape-based analysis for neoplasms characterization, Fernando Yepes-Calderon, Children's Hospital Los Angeles (USA); Rebecca L. Johnson, Yi Lao, The Univ. of Southern California (USA); Darryl H. Hwang, Keck Medicine of USC (USA); Julie Coloigner, Children's Hospital Los Angeles (USA); Felix Yap, Desai Bushan, Philip Cheng, Inderbir Gill, Vinay Duddalwar, Keck Medicine of USC (USA); Natasha Leporé, Children's Hospital Los Angeles (USA) and The Univ. of Southern California (USA) . . . . . [9788-96]

Lung

3D segmentation of lung CT data with graph-cuts; analysis of parameter sensitivities, Jung won Cha, Neal Dunlap, Brian Wang, Amir A. Amini, Univ. of Louisville (USA) . . . . . [9788-97]

Novel MR Techniques and Applications

Quantification of traumatic meningeal injury using dynamic contrast enhanced (DEC) fluid attenuated inversion recovery (FLAIR) imaging, Marcelo A. Castro, Joshua P. Williford, Ctr. for Neuroscience and Regenerative Medicine (USA) and Henry M. Jackson Foundation (USA) and National Institutes of Health (USA); Martin R. Cota, Ctr. for Neuroscience and Regenerative Medicine (USA) and Henry M. Jackson Foundation (USA) and National Institues of Health (USA); Judy M. MacLaren, Suburban Hospital (USA); Bernard J. Dardzinski, Uniformed Services Univ. of the Health Sciences (USA); John A. Butman, National Institutes of Health (USA); Dzung L. Pham, Lawrence L. Latour, Ctr. for Neuroscience and Regenerative Medicine (USA) and Henry M. Jackson Foundation (USA) . . . . . [9788-50]

Application of probabilistic fiber-tracking method of MR imaging to measure impact of cranial irradiation on structural brain connectivity in children treated for medulloblastoma, Elizabeth Duncan, Wilburn E. Reddick, John O. Glass, St. Jude Children's Research Hospital (USA) . . . . . [9788-98]

Multi-temporal MRI carpal bone volumes analysis by principal axes registration, Roberta Ferretti, Silvana Dellepiane, Univ. degli Studi di Genova (Italy) . . . . . [9788-100]

A framework for incorporating DTI atlas builder registration into tract-based spatial statistics and a simulated comparison to standard TBSS, Matthew J. Leming, The Univ. of North Carolina at Chapel Hill (USA); Rachel Steiner, Vanderbilt Univ. (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9788-101]

Hippocampus shape snalysis for temporal lobe epilepsy detection in magnetic resonance imaging, Zohreh Kohan, Reza Azmi, Alzahra Univ. (Iran, Islamic Republic of) . . . . . [9788-102]

Multi-site study of diffusion metric variability: effects of site, vendor, field strength, and echo time on regions-of-interest and histogram-bin analyses, Karl Helmer, Athinoula A. Martinos Ctr. for Biomedical Imaging (USA); Ming-Chung Chou, Kaohsiung Medical Univ. (Taiwan); Ronny I. Preciado, Athinoula A. Martinos Ctr. for Biomedical Imaging (USA); Barjor Gimi, The Geisel School of Medicine at Dartmouth (USA); Nancy Rollins, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Allen Song, Brain Imaging and Analysis Ctr., Duke Univ. School of Medicine (USA); Jessica Turner, The MIND Research Network (USA); Susumu Mori, Johns Hopkins Univ. School of Medicine (USA) . . . . . [9788-108]

CONFERENCE 9791

Digital Pathology

Session Chair: **Elizabeth A. Krupinski,** Emory Univ. School of Medicine (USA)

Automatic labeling of molecular biomarkers on a cell-by-cell basis in immunohistochemistry images using convolutional neural networks, Fahime Sheikhzadeh, Univ. of British Columbia (Canada) and BC Cancer Research Ctr. (Canada); Anita Carraro, Jagoda Korbelik, Calum E. MacAulay, Martial Guillaud, BC Cancer Research Ctr. (Canada); Rabab K. Ward, The Univ. of British Columbia (Canada) . . . . . [9791-17]

Whole histological slide image analysis for radiation-induced cellular and vascular changes in brain tumors, Emmanuel Brun, MoreHisto (France); Raphael Serduc, INSERM U836 (France) . . . . . [9791-26]

Deciphering protein signatures using color, morphological, and topological analysis of immunohistochemically stained human tissues, Erwan Zerhouni, Bogdan Prisacari, IBM Research - Zürich (Switzerland); Qing Zhong, Peter Wild, UniversitätsSpital Zürich (Switzerland); Maria Gabrani, IBM Research - Zürich (Switzerland) . . . . . [9791-27]

A machine learning approach to quantifying noise in medical images, Aritra Chowdhury, Rensselaer Polytechnic Institute (USA); Kareem S. Aggour, Steven M. Gustafson, Christopher J. Sevinsky, GE Global Research (USA); Bülent Yener, Rensselaer Polytechnic Institute (USA) . . . . . [9791-28]

Pathological Gleason prediction through gland ring morphometry in immunofluorescent prostate cancer images, Richard Scott, Icahn School of Medicine at Mount Sinai (USA); Faisal Khan, Rutgers, The State Univ. of New Jersey (USA) and Icahn School of Medicine at Mount Sinai (USA); Jack Zeineh, Michael Donovan, Gerardo Fernandez, Icahn School of Medicine at Mount Sinai (USA) . . . . . [9791-29]

Color-texture based extreme learning machines for tissue tumor classification, Xulei Yang, Si Yong Yeo, Sum-Thai Wong, Gary Lee, Yi Su, A*STAR Institute of High Performance Computing (Singapore); Jia Mei Hong, Andre B. H. Choo, Sulin Chen, A*STAR Bioprocessing Technology Institute (Singapore) . [9791-30]

Cell nuclei attributed relational graphs for efficient representation and classification of gastric cancer in digital histopathology, Harshita Sharma, Technische Univ. Berlin (Germany); Norman Zerbe, Daniel Heim, Stephan Wienert, Sebastian Lohmann, Charité Universitätsmedizin Berlin (Germany); Olaf Hellwich, Technische Univ. Berlin (Germany); Peter Hufnagl, Charité Universitätsmedizin Berlin (Germany) . . . . . [9791-31]

Mixture of online learners for cancer stem cell detection in CD133 colored microscopic images, Oguzhan Oguz, Maen Mallah, Bilkent Univ. (Turkey); Christian Münzenmayer, Thomas Wittenberg, Fraunhofer-Institut für Integrierte Schaltungen (IIS) (Germany); Aysegül Üner, Hacettepe Univ. (Turkey); Rengül Çetin Atalay, Middle East Technical Univ. (Turkey); Ahmet E. Cetin, Bilkent Univ. (Turkey) . . . . . [9791-32]

Automatic extraction of a novel imaging biomarker from fluorescence microscopic imaging of TRA-8/DR5 oligomers to predict TRA-8 therapeutic efficacy in breast and pancreatic cancer mouse models, Hyunki Kim, Donald J. Buchsbaum, Kurt R. Zinn, The Univ. of Alabama at Birmingham (USA). . . [9791-33]

Identification of leukocyte infiltration in hematoxylin-eosin stained breast cancer samples: texture-based classification of tissue morphologies, Riku Turkki, Nina Linder, Panu E. Kovanen, Johan Lundin, Teijo Pellinen, Univ. of Helsinki (Finland) . . . . . [9791-34]

Histology image segmentation with hierarchical multi-level thresholding, Hady Ahmady Phoulady, Dmitry B. Goldgof, Lawrence O. Hall, Peter R. Mouton, Univ. of South Florida (USA) . . . . . [9791-35]

Quantification of tumor morphology via 3D histology: Application to oral cavity cancers, Scott Doyle, John E. Tomaszewski M.D., Margaret Brandwein-Gensler, Univ. at Buffalo (USA) . . [9791-36]

Designing an automated classification method using latent support vector machine algorithms as a predictive tool for prostate cancer lesions, Nilgoon Zarei, Univ. of British Columbia (Canada) and BC Cancer Research Ctr. (Canada); Amir Bakhtiari, Simon Fraser Univ. (Canada); Anita Carraro, Jagoda Korbelik, Martial Guillaud, BC Cancer Research Ctr. (Canada); Mira Keyes, British Columbia Cancer Agency (Canada); Calum E. MacAulay, BC Cancer Research Ctr. (Canada) . . . . . [9791-37]

Automatic cell detection and segmentation from H&E stained pathology slides using colorspace decorrelation stretching, Mohammad Peikari, Univ. of Toronto (Canada); Anne L. Martel, Univ. of Toronto (Canada) and Sunnybrook Research Institute (Canada) . . . . . [9791-38]

Deep learning-based gland quantification in digitized tissue samples from patients with colorectal cancer: associations with clinical data and outcome, Dmitrii Bychkov, Riku Turkki, Univ. of Helsinki (Finland); Nina Linder M.D., Johan Lundin M.D., Univ. of Helsinki (Finland) and Karolinska Institutet (Sweden) . . . . . [9791-39]

High-definition infrared imaging of colon sections for improved automated histology, Saumya Tiwari, Shachi Mittal, Beckman Institute for Advanced Science and Technology (USA) and Univ. of Illinois at Urbana-Champaign (USA); Tomasz P. Wrobel, Beckman Institute for Advanced Science and Technology (USA); Rohit Bhargava, Beckman Institute for Advanced Science and Technology (USA) and Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9791-40]

Hierarchical nucleus segmentation in digital pathology images, Yi Gao, Vadim Ratner, Liangjia Zhu, Tammy Diprima, Tahsin Kurc, Allen R. Tannenbaum, Joel H. Saltz M.D., Stony Brook Univ. (USA) . . . . . [9791-41]

A four class model for digital breast histopathology using high-definition Fourier transform infrared (FT-IR) spectroscopic imaging, Shachi Mittal, Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9791-42]

The role of imaging based prostate biopsy morphology in a data fusion paradigm for transducing prognostic predictions, Faisal Khan, Rutgers, The State Univ. of New Jersey (USA) and Icahn School of Medicine at Mount Sinai (USA); Casimir A. Kulikowski, Rutgers, The State Univ. of New Jersey (USA) . . . . . [9791-43]

Toward phenotypic analysis of whole zebrafish from synchrotron microCT images: Automated detection and segmentation of cell nuclei, Yifu Ding, Thomas Tavolara, Penn State College of Medicine (USA); David J. Miller, The Pennsylvania State Univ. (USA); Keith C. Cheng, Penn State College of Medicine (USA) . . . . . [9791-44]

Automatic choroid cells segmentation and counting in fluorescence microscopic image, Jianjun Fei, Xinjian Chen, Weifang Zhu, Fei Shi, Xiao Lin, Lei Yang, Soochow Univ. (China) . . . . [9791-45]

Classification of human carcinoma cells using hyperspectral imagery, Umut Çinar, Yasemin Yardimci Cetin, Rengül Çetin Atalay, Middle East Technical Univ. (Turkey); Ahmet E. Cetin, Bilkent Univ. (Turkey) . . . . . [9791-46]

High-definition Fourier transform infrared spectroscopic imaging of prostate tissue, Tomasz P. Wrobel, Univ. of Illinois at Urbana-Champaign (USA); Andre Kajdacsy-Balla, Univ. of Illinois at Chicago (USA); Rohit Bhargava, Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9791-47]

A generic nuclei detection method for histopathological breast images, Henning Kost, André Homeyer, Fraunhofer MEVIS (Germany); Peter Bult, Maschenka Balkenhol, Jeroen A. W. M. van der Laak, Radboud Univ. Medical Ctr. (Netherlands); Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . [9791-48]

WEDNESDAY 2 MARCH

CONFERENCE 9783
Physics of Medical Imaging

Room: Town & Country

SESSION 12
Room: Town & Country . Wed 8:00 to 9:40 am

Photon Counting CT II: Spectral Imaging

Session Chairs: **Taly G. Gilat-Schmidt,** Marquette Univ. (USA); **Mats Danielsson,** KTH Royal Institute of Technology (Sweden)

8:00 am: **Spatio-energetic cross-talks in photon counting detectors: detector model and correlated Poisson data generator**, Katsuyuki Taguchi, Okkyun Lee, Johns Hopkins Univ. (USA); Steffen G. Kappler, Siemens Healthcare (Germany) . . . . . [9783-59]

8:20 am: **Comparison of quantitative k-edge empirical estimators using an energy-resolved photon-counting detector**, Kevin C. Zimmerman, Taly G. Gilat-Schmidt, Marquette Univ. (USA) . . . . . [9783-60]

8:40 am: **Conventional CT images from spectral measurements**, Paurakh L. Rajbhandary, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9783-61]

9:00 am: **Improving material decomposition by spectral optimization of photon counting computed tomography**, Christoph Polster, Siemens Healthcare GmbH (Germany) and Institute for Clinical Radiology, Ludwig-Maximilians-Univ. Hospital (Germany); Katharina Hahn, Siemens Healthcare GmbH (Germany); Ralf Gutjahr, Siemens Healthcare GmbH (Germany) and CAMP, Technische Univ. München (Germany); Friederike Schöck, Steffen G. Kappler, Karl Stierstorfer, Siemens Healthcare GmbH (Germany); Olaf Dietrich, Institute for Clinical Radiology, Ludwig-Maximilians-Univ. Hospital München (Germany); Thomas G. Flohr, Siemens Healthcare GmbH (Germany). . . . . [9783-62]

9:20 am: **Optimal selection of thresholds for photon counting CT**, Thomas P. O'Donnell, Siemens Healthcare (USA); Rabe'e Cheheltani, Univ. of Pennsylvania (USA); Friederike Schoeck, Siemens Healthcare (Germany); David Cormode, Univ. of Pennsylvania (USA); Zahi Fayad, Translational and Molecular Imaging Instituite, Mount Sinai School of Medicine (USA) . . . . . [9783-63]

Coffee Break. . . .Wed 9:40 am to 10:10 am

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CONFERENCE 9784
Image Processing

Room: San Diego

SESSION 5
Room: San Diego . . . . . Wed 8:00 to 9:40 am

Image Enhancement

Session Chair: **Elsa D. Angelini,** Columbia Univ. (USA), Télécom ParisTech (France)

8:00 am: **Geodesic denoising for optical coherence tomography images**, Ehsan Shahrian Varnousfaderani, Hamilton Glaucoma Ctr. (USA); Wolf-Dieter Vogl, Jing Wu, Bianca S. Gerendas, Christian Simader, Georg Langs, Sebastian M. Waldstein M.D., Ursula Schmidt-Erfurth, Christian Doppler Lab. for Ophthalmic Image Analysis (Austria) . . . . . [9784-19]

8:20 am: **Combined self-learning based single-image super-resolution and dual-tree complex wavelet transform denoising for medical images**, Guang Yang, Imperial College London (UK); Xujiong Ye, Univ. of Lincoln (UK); Greg Slabaugh, City Univ. London (UK); Jennifer Keegan, Raad H. Mohiaddin, David Firmin, National Heart and Lung Institute (UK) . . . . . [9784-20]

8:40 am: **Sinogram smoothing and interpolation via alternating projections onto the slope and curvature constraints**, Davood Karimi, Rabab Kreidieh Ward, The Univ. of British Columbia (Canada) . . . . . [9784-21]

9:00 am: **A novel structured dictionary for fast processing of 3D medical images, with application to computed tomography restoration and denoising**, Davood Karimi, Rabab Kreidieh Ward, The Univ. of British Columbia (Canada) . . . . . [9784-22]

9:20 am: **Enhanced intravascular near-infrared spectroscopy (NIRS) imaging system for detection of lipid core plaques in coronary arteries**, Zhihua He, Stephen T. Sum, InfraReDx, Inc. (USA) . . . . . [9784-23]

Coffee Break. . . .Wed 9:40 am to 10:10 am

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CONFERENCE 9785
Computer-Aided Diagnosis

Room: Golden West

SESSION 12
Room: Golden West . . . . Wed 8:00 to 9:40 am

Colon and Prostate

Session Chairs: **Janne J. Näppi,** Massachusetts General Hospital (USA); **Kenji Suzuki,** Illinois Institute of Technology (USA)

8:00 am: **Decision forests for learning prostate cancer probability maps from multiparametric MRI** , Henry Ehrenberg, Daniel Cornfeld, Cayce B. Nawaf, Preston C. Sprenkle, James S. Duncan, Yale Univ. (USA). . . . . [9785-54]

8:20 am: **Fusion of multi-parametric MRI and temporal ultrasound for characterization of prostate cancer: in vivo feasibility study**, Farhad Imani, Purang Abolmaesumi, The Univ. of British Columbia (Canada); Sahar Ghavidel, Queen's Univ. (Canada); Siavash Khallaghi, The Univ. of British Columbia (Canada); Eli Gibson, Western Univ. (Canada); Amir Khojaste, Queen's Univ. (Canada); Mena Gaed, Western Univ. (Canada); Madeleine Moussa, José A. Gomez, London Health Sciences Ctr. (Canada); Cesare Romagnoli, The Univ. of British Columbia (Canada); Derek W. Cool, Matthew Bastian-Jordan, Zahra Kassam, Western Univ. (Canada); D. Robert Siemens, Michael Leveridge, Kingston General Hospital (Canada); Silvia Chang, Vancouver General Hospital (Canada); Aaron Fenster, Aaron D. Ward, Western Univ. (Canada); Parvin Mousavi, Queen's Univ. (Canada) . . . . . [9785-55]

8:40 am: **An integrated classifier for computer-aided diagnosis of colorectal polyps based on random forest and location index strategies**, Yifan Hu, Hao Han, Wei Zhu, Zhengrong Liang, Stony Brook Univ. (USA). . . . . [9785-56]

9:00 am: **Deep learning for electronic cleansing in dual-energy CT colonography**, Rie Tachibana, Institute of National Colleges of Technology (Japan); Janne J. Nappi, Toru Hironakaa, Massachusetts General Hospital (USA); Se Hyung Kim, Seoul National Univ. Hospital (Korea, Republic of); Hiroyuki Yoshida, Massachusetts General Hospital (USA) . . . . . [9785-57]

9:20 am: **Colitis detection on abdominal CT scans by rich feature hierarchies**, Jiamin Liu, Nathan Lay, Le Lu, Zhuoshi Wei, Lauren Kim, Evrim B. Turkbey, Ronald M. Summers, National Institutes of Health (USA) . . . . . [9785-58]

Coffee Break. . . .Wed 9:40 am to 10:10 am

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CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 1
Room: California . . . . . Wed 8:00 to 9:40 am

Technology Assessment in Breast Imaging

Session Chair: **Robert M. Nishikawa,** Univ. of Pittsburgh (USA)

8:00 am: **Automatic and accurate: Quantra reproduces BI-RADS assessment on a two-point scale**, Ernest U. Ekpo, Mark F. McEntee, The Univ. of Sydney (Australia); Mary Rickard, The Univ. of Sydney (Australia) and Sydney Breast Clinic (Australia); Patrick C. Brennan, Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) . . . . . [9787-21]

8:20 am: Validated novel software to measure the conspicuity index of focal lesions within DICOM images, Katy Szczepura, Univ. of Salford (UK); David J. Manning, Lancaster Univ. (UK) . . [9787-22]

8:40 am: **Impact of two types of image processing on cancer detection in mammography,** Lucy M. Warren, Mark D. Halling-Brown, Padraig T. Looney, The Royal Surrey County Hospital NHS Trust (UK); David R. Dance, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Louise Wilkinson, St George's Healthcare NHS Trust (UK); Matthew G. Wallis, Cambridge Univ. Hospitals NHS Foundation Trust (UK) and NIHR Cambridge Biomedical Research Ctr. (UK); Rosalind M. Given-Wilson, St. George's Hospital (UK); Julie Cooke, Jarvis Breast Screening and Diagnostic Ctr. (UK); Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK) . . . . . [9787-23]

9:00 am: **Potential workflow advantages with single 8MP versus dual 5MP displays,** Elizabeth A. Krupinski, The Univ. of Arizona (USA) . . . . . [9787-25]

9:20 am: **Discriminatory power of common genetic variants in personalized breast cancer diagnosis,** Yirong Wu, Univ. of Wisconsin-Madison (USA); Jie Liu, Univ. of Washington (USA); Irene Ong, Univ. of Wisconsin-Madison (USA); Peggy Peissig, Adedayo A. Onitilo, Marshfield Clinic (USA); Jun Fan, Ming Yuan, Univ. of Wisconsin-Madison (USA); Elizabeth S. Burnside M.D., Univ. of Wisconsin Hospitals and Clinics (USA) . . . . . [9787-24]

Coffee Break. . . . Thu 9:40 am to 10:10 am

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 3
Room: Royal Palm One . Wed 8:00 to 9:40 am

Bone and Skeletal Imaging, Biomechanics

Session Chairs: **Robert C. Molthen,** Medical College of Wisconsin (USA); **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA)

8:00 am: **Automated reconstruction of standing posture panoramas from multi-sector long limb x-ray images**, Linzey Miller, Rochester Institute of Technology (USA); Caroline Trier, Washington Univ. in St. Louis (USA); Kfir Y. Ben-Zikri, Cristian A. Linte, Rochester Institute of Technology (USA). . . [9788-10]

8:20 am: **Patellar segmentation from 3D magnetic resonance images using guided recursive ray-tracing for edge pattern detection**, Ruida Cheng, Jennifer Jackson, Evan S. McCreedy, William Gandler, National Institutes of Health (USA); Joost J. F. A. Eijkenboom, Marienke van Middelkoopm, Erasmus MC (Netherlands); Matthew J. McAuliffe, Frances T. Gavelli, National Institutes of Health (USA) . . . . . [9788-11]

8:40 am: **Unsupervised segmentation of MRI knees using image partition forests**, Marija Marcan, Irina Voiculescu, Univ. of Oxford (UK) . . . . . [9788-12]

9:00 am: **Trabecular bone texture classification using wavelet leaders**, Zilong Zou, Temple Univ. (USA) and Beihang Univ. (China); Jie Yang, Temple Univ. (USA); Vasileios Megalooikonomou, Univ. of Patras (Greece); Rachid Jennane, Univ. d'Orléans (France); Erkang Cheng, Broncus Medical, Inc. (USA); Haibin Ling, Temple Univ. (USA) . . . . . [9788-13]

9:20 am: **Intensity-based femoral atlas 2D/3D registration using Levenberg-Marquardt optimisation**, Ondrej Klima, Petr Kleparnik, Brno Univ. of Technology (Czech Republic); Michal Spanel, 3Dim Laboratory s.r.o. (Czech Republic); Pavel Zemcik, Brno Univ. of Technology (Czech Republic) . . . . . [9788-14]

Coffee Break. . . .Wed 9:40 am to 10:10 am

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WEDNESDAY 2 MARCH

CONFERENCE 9783
Physics of Medical Imaging

Room: Town & Country

SESSION 13
Room: Town & Country . . . . Wed 10:10 am to 12:10 pm

New Systems and Technologies

Session Chairs: **Rebecca Fahrig,** Stanford Health Care (USA); **Ingrid S. Reiser,** The Univ. of Chicago (USA)

10:10 am: **Method for dose-reduced 3D catheter tracking on a scanning-beam digital x-ray system using dynamic electronic collimation**, David A. P. Dunkerley, Univ. of Wisconsin-Madison (USA); Tobias Funk, Triple Ring Technologies, Inc. (USA); Michael A. Speidel, Univ. of Wisconsin-Madison (USA) . . . . . .[9783-64]

10:30 am: **Multi-gamma-source CT imaging system: a feasibility study with the Poisson noise**, Sunhee Wi, Seungryong Cho, KAIST (Korea, Republic of) . . .[9783-65]

10:50 am: **Investigation of noise and contrast sensitivity of an electron multiplying charge couple device (EMCCD) based cone beam micro-CT system**, Sumukh Bysani Krishnakumar, Alexander R. Podgorsak, Toshiba Stroke and Vascular Research Ctr.,Univ. at Buffalo (USA); Swetadri Vasan Setlur Nagesh, Amit Jain, Toshiba Stroke and Vascular Research Ctr. (USA); Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Univ. at Buffalo (USA) and Toshiba Strike and Vascular Research Ctr. (USA) . . .[9783-66]

11:10 am: **High-spatial-resolution nanoparticle x-ray fluorescence tomography**, Jakob C. Larsson, William Vågberg, Carmen Vogt, Ulf Lundström, Daniel H. Larsson, Hans M. Hertz, KTH Royal Institute of Technology (Sweden). . .[9783-67]

11:30 am: **Time resolved in vivo x-ray imaging at the micrometer scale in 3D opens new avenues in functional anatomy**, Rajmund Mokso, Goran Lovric, Paul Scherrer Institut (Switzerland); Martin Nyvlt, Marek Skeren, Czech Technical Univ. in Prague (Czech Republic); Johannes Schittny, Univ. Bern (Switzerland); Matthias Roth-Kleiner, Ctr. Hospitalier Univ. Vaudois (Switzerland); Marco F. M. Stampanoni, ETH Zürich (Switzerland) and Paul Scherrer Institut (Switzerland). . . . . .[9783-68]

11:50 am: **800-MeV magnetic-focused flash proton radiography for high-contrast imaging of low-density biologically relevant targets using an inverse-scatter collimator**, Matthew Freeman, Frank E. Merrill, Dale Tupa, Los Alamos National Lab. (USA). . . . .[9783-69]

Lunch Break . . . .Wed 12:10 pm to 1:20 pm

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CONFERENCE 9784
Image Processing

Room: San Diego

SESSION 6
Room: San Diego . Wed 10:10 am to 12:10 pm

Shape

Session Chairs: **Cristian Lorenz,** Philips Research (Germany) **Tomaž Vrtovec,** Univ. of Ljubljana (Slovenia)

10:10 am: **Landmark based shape analysis for cerebellar ataxia classification and cerebellar atrophy pattern visualization**, Zhen Yang, Johns Hopkins Univ. (USA); Sayed M. Abulnaga, The Univ. of British Columbia (Canada); Aaron Carass, Johns Hopkins Univ. (USA); Kalyani Kansal, The Johns Hopkins School of Medicine (USA); Bruno M. Jedynak, Johns Hopkins Univ. (USA); Chiadi U. Onyike, Sarah H. Ying, Johns Hopkins School of Medicine (USA); Jerry L. Prince, Johns Hopkins Univ. (USA). . . . . .[9784-24]

10:30 am: **Multi-object, model-based, multi-atlas, segmentation for rodent brains using dense discrete correspondences**, Joohwi Lee, Ilwoo Lyu, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9784-25]

10:50 am: **Fast correspondences for statistical shape models of brain structures**, Florian Bernard, Ctr. Hospitalier de Luxembourg (Luxembourg) and Luxembourg Ctr. for Systems Biomedicine (Luxembourg) and Hochschule Trier (Germany); Nikos A. Vlassis, Adobe Systems Inc. (USA); Peter Gemmar, Hochschule Trier (Germany); Andreas Husch, Ctr. Hospitalier de Luxembourg (Luxembourg) and Luxembourg Ctr. for Systems Biomedicine (Luxembourg) and Hochschule Trier (Germany); Johan Thunberg, Luxembourg Ctr. for Systems Biomedicine (Luxembourg); Jorge Goncalves, Luxembourg Ctr. for Systems Biomedicine (Luxembourg) and Univ. of Cambridge (UK); Frank Hertel, Ctr. Hospitalier de Luxembourg (Luxembourg). . . . . .[9784-26]

11:10 am: **Robust group-wise rigid registration of point sets using t-mixture model**, Nishant Ravikumar, Ali Gooya, Alejandro F. Frangi, Zeike A. Taylor, The Univ. of Sheffield (UK) . . . . . [9784-27]

11:30 am: **Multi-region statistical shape model for cochlear implantation**, Jordi Romera Romero, Univ. Pompeu Fabra (Spain); Hans M. Kjer, Technical Univ. of Denmark (Denmark); Mario Ceresa, Univ. Pompeu Fabra (Spain) . . . . . [9784-28]

11:50 am: **Whole abdominal wall segmentation using augmented active shape models (AASM) with multi-atlas label fusion and level set**, Zhoubing Xu, Vanderbilt Univ. (USA); Rebeccah B. Baucom, Vanderbilt Univ. Medical Ctr. (USA); Richard G. Abramson, Vanderbilt Univ. (USA); Benjamin K. Poulose, Vanderbilt Univ. Medical Ctr. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . .[9784-29]

Lunch Break . . . . . Wed 12:10 pm to 1:20 pm

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CONFERENCE 9785
Computer-Aided Diagnosis

Room: Golden West

SESSION 13
Room: Golden West . . . . . Wed 10:10 am to 12:10 pm

Abdominal

Session Chairs: **Hiroyuki Yoshida,** Massachusetts General Hospital (USA); **Kensaku Mori,** Nagoya Univ. (Japan)

10:10 am: **Automatic detection of ureter lesions in CT urography**, Trevor Exell, Lubomir M. Hadjiiski, Heang-Ping Chan, Kenny H. Cha, Elaine M. Caoili, Richard H. Cohan M.D., Jun Wei, Chuan Zhou, Univ. of Michigan Health System (USA) . .[9785-59]

10:30 am: **Segmentation of hepatic arteries in multi-phase liver CT using directional dilation and connectivtiy analysis**, Lei Wang, Fraunhofer MEVIS (Germany); Alena-Kathrin Schnurr, Otto-von-Guericke Univ. Magdeburg (Germany); Stephan Zidowitz, Horst K. Hahn, Fraunhofer MEVIS (Germany); Christian Hansen, Otto-von-Guericke Univ. Magdeburg (Germany) . . . . . .[9785-60]

10:50 am: **Semi-automatic assessment of pediatric hydronephrosis severity in 3D ultrasound**, Juan J. Cerrolaza, Hansel Otero M.D., Children's National Health System (USA); Peter Yao, Princeton Univ. (USA); Elijah Biggs, Children's National Health System (USA); Roberto Ardon, Philips Research (France); James Jago, Philips Healthcare (USA); Craig A. Peters M.D., Marius G. Linguraru, Children's National Health System (USA) . . .[9785-61]

11:10 am: **Machine-learning based comparison of CT-perfusion maps and dual energy CT for pancreatic tumor detection**, Michael Goetz, Deutsches Krebsforschungszentrum (Germany); Stephan Skornitzke, UniversitätsKlinikum Heidelberg (Germany); Christian Weber, Deutsches Krebsforschungszentrum (Germany); Franziska Fritz, Philipp Mayer, Marco Koell, Wolfram Stiller, UniversitätsKlinikum Heidelberg (Germany); Klaus H. Maier-Hein, Deutsches Krebsforschungszentrum (Germany)[9785-62]

11:30 am: **Automatic anatomy recognition on CT images with pathology**, Lidong Huang, BeiHang Univ. (China) and Univ. of Pennsylvania (USA); Jayaram K. Udupa, Yubing Tong, Dewey Odhner, Drew A. Torigian, Univ. of Pennsylvania (USA) . . . . . .[9785-63]

11:50 am: **Differentiating bladder carcinoma from bladder wall using 3D textural features: an initial study**, Xiaopan Xu, Xi Zhang, Yang Liu, Fourth Military Medical Univ. (China); Qiang Tian, Tangdu Hospital (China); Guopeng Zhang, Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . .[9785-64]

CONFERENCE 9785 ENDS

CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 2
Room: California . Wed 10:10 am to 12:10 pm

Model Observers I

Session Chair: **François O. Bochud,** Ctr. Hospitalier Univ. Vaudois (Switzerland)

10:10 am: **Can model observers be developed to reproduce radiologists' diagnostic performances? Our study says not so fast!**, Juhun Lee, Univ. of Pittsburgh Cancer Institute (USA); Robert M. Nishikawa, Univ. of Pittsburgh (USA); Ingrid S. Reiser, The Univ. of Chicago (USA); John M. Boone, UC Davis Medical Ctr. (USA) . . . . . [9787-4]

10:30 am: **Applying the J-optimal channelized quadratic observer to a SPECT phantom for myocardial perfusion defect detection**, Meredith K. Kupinski, College of Optical Sciences, The Univ. of Arizona (USA); Eric W. Clarkson, The Univ. of Arizona (USA); Michael Ghaly, Eric C. Frey, Johns Hopkins Univ. (USA) . . . . . [9787-5]

10:50 am: **Identification of error making patterns in lesion detection on digital breast tomosynthesis using computer-extracted image features**, Mengyu Wang, Duke Univ. (USA); Jing Zhang, Lamar Univ. (USA); Lars J. Grimm, Sujata V. Ghate, Ruth Walsh, Karen S. Johnson, Joseph Y. Lo, Maciej A. Mazurowski, Duke Univ. (USA) . . . . . [9787-6]

11:10 am: **Location- and lesion-dependent estimation of background tissue complexity for anthropomorphic model observer**, Ali R. N. Avanaki, Barco, Inc. (USA) . . . . . [9787-7]

11:30 am: **Task-based optimization of flip angle for texture analysis in MRI**, Jonathan F. Brand, College of Optical Sciences, The Univ. of Arizona (USA); Lars R. Furenlid, The Univ. of Arizona College of Medicine (USA) and College of Optical Sciences, The Univ. of Arizona (USA); Maria I. Altbach, Jean-Phillippe Galons, Puneet Sharma, Achyut Bhattacharyya M.D., Tulshi Bhattacharyya, Ali Bilgin, Diego R. Martin M.D., The Univ. of Arizona College of Medicine (USA) . . . . . [9787-8]

11:50 am: **Task-based detectability comparison of exponential transformation of free-response operating characteristic (EFROC) curve and channelized Hotelling observer (CHO)**, Parag Khobragade, Marquette Univ. (USA); Jiahua Fan, Franco Rupcich, Dominic Crotty, GE Healthcare (USA); Taly G. Gilat-Schmidt, Marquette Univ. (USA) . . . . [9787-9]

Lunch Break . . . .Wed 12:10 pm to 1:20 pm

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 4
Room: Royal Palm One . . . . .Wed 10:10 am to 12:10 pm

Keynote and Neurological Imaging

Session Chairs: **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA); **Barjor Gimi,** Dartmouth Hitchcock Medical Ctr. (USA)

10:10 am: **Interesting *in-vivo* magnetic resonance experiments that are not quite ready for prime time and some that are** *(Keynote Presentation)*, Joseph J.H. Ackerman, Washington Univ. in St. Louis (USA). . . . . [9788-15]

11:10 am: **Surface displacement based change in shape of central brain structures with pre-term birth**, Amanmeet Garg, Simon Fraser Univ. (Canada); Ruth E. Grunau, The Univ. of British Columbia (Canada); Steven Miller, Univ. of Toronto (Canada); Bruce Bjornson, Kenneth J. Poskitt, The Univ. of British Columbia (Canada); Mirza Faisal Beg, Simon Fraser Univ. (Canada) . . . .[9788-16]

11:30 am: **Modeling the brain morphology distribution in the general aging population**, Wyke Huizinga, Erasmus MC (Netherlands); Dirk H. J. Poot, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands); Gennady Roshchupkin, Esther E. Bron, Arfan M. Ikram, Meike W. Vernooij, Erasmus MC (Netherlands); Daniel Rueckert, Imperial College London (UK); Wiro J. Niessen, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands); Stefan Klein, Erasmus MC (Netherlands) . . . . .[9788-17]

11:50 am: **Enhancing genetic correlations between blood and brain using latent factors of correlated blood measures**, Neda Jahanshad, The Univ. of Southern California (USA) . . . . . [9788-18]

Lunch Break . . . .Wed 12:10 pm to 1:20 pm

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WEDNESDAY 2 MARCH

CONFERENCE 9783
Physics of Medical Imaging

Room: Town & Country

SESSION 14
Room: Town & Country . Wed 1:20 to 3:00 pm

Scatter and Diffraction Imaging

Session Chairs: **Mini Das,** Univ. of Houston (USA); **Guang-Hong Chen,** Univ. of Wisconsin-Madison (USA)

1:20 pm: **Method to study sample size limit of small-angle x-ray scattering computed tomography**, Mina Choi, U.S. Food and Drug Administration (USA) and Univ. of Maryland, College Park (USA); Bahaa Ghammraoui, Andreu Badal, Aldo Badano, U.S. Food and Drug Administration (USA) . . . . . [9783-70]

1:40 pm: **Onmidirectional scattering x-ray imaging with gratings**, Matias E. Kagias, Zhentian Wang, Paul Scherrer Institut (Switzerland) and ETH Zürich (Switzerland); Pablo Villanueva, Konstantins Jefimovs, Paul Scherrer Institut (Switzerland); Marco F. M. Stampanoni, Paul Scherrer Institut (Switzerland) and ETH Zürich (Switzerland) . . . . . [9783-71]

2:00 pm: **Coded aperture x-ray diffraction imaging for lung cancer detection**, Anuj J. Kapadia, Robert E. Morris, Manu N. Lakshmanan, Katie Albanese, Ehsan Samei, Joel A. Greenberg, Duke Univ. (USA). . . [9783-72]

2:20 pm: **Coded aperture x-ray diffraction imaging with transmission computed tomography side-information**, Ikenna Odinaka, Joel A. Greenberg, Yan Kaganovsky, Andrew D. Holmgren, Mehadi Hassan, Duke Univ. (USA); David G. Politte, Joseph A. O'Sullivan, Washington Univ. in St. Louis (USA); Lawrence Carin, David J. Brady, Duke Univ. (USA) . . . . . [9783-73]

2:40 pm: **Coded aperture coherent scatter imaging for breast cancer detection: a Monte Carlo evaluation**, Manu N. Lakshmanan, Duke Univ. Medical Ctr. (USA); Joel A. Greenberg, Duke Univ. (USA); Ehsan Samei, Anuj J. Kapadia, Duke Univ. Medical Ctr. (USA) . . . . . [9783-74]

Coffee Break. . . . Wed 3:00 pm to 3:30 pm

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CONFERENCE 9784
Image Processing

Room: San Diego

SESSION 7
Room: San Diego . . . . . Wed 1:20 to 3:00 pm

Motion/Registration

Session Chair: **Kensaku Mori,** Nagoya Univ. (Japan)

1:20 pm: **Image-based navigation for functional endoscopic sinus surgery using structure from motion**, Simon Leonard, Austin Reiter, Ayushi Sinha, Masaru Ishii M.D., Russell H. Taylor, Gregory D. Hager, Johns Hopkins Univ. (USA) . . . . . .[9784-30]

1:40 pm: **Coronary calcium visualization using dual energy chest radiography with sliding organ registration**, Di Wen, Case Western Reserve Univ. (USA); Katelyn Nye, GE Healthcare (USA); Bo Zhou, Case Western Reserve Univ. (USA); Robert C. Gilkeson, Univ. Hospitals Case Medical Ctr. (USA); David L. Wilson, Case Western Reserve Univ. (USA). . . . [9784-31]

2:00 pm: **Combined registration and motion correction of longitudinal retinal OCT data**, Andrew Lang, Aaron Carass, Omar Al-Louzi, Pavan Bhargava, Sharon D. Solomon, Peter A. Calabresi, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . .[9784-32]

2:20 pm: **Effects of spatial resolution on image registration**, Can Zhao, Aaron Carass, Amod Jog, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . .[9784-33]

2:40 pm: **Non-rigid contour-to-pixel registration of photographic and quantitative light-induced fluorescence imaging of decalcified teeth**, Rosalia Tatano, Benjamin Berkels, RWTH Aachen Univ. (Germany); Thomas Deserno, Uniklinik RWTH Aachen (Germany); Ekaterina Sirazitdinova, RWTH Aachen Univ. Hospital (Germany); Ulrike B. Fritz, Eva E. Ehrlich, Uniklinik-RWTH Aachen (Germany) . . . . . .[9784-34]

Coffee Break. . . . Wed 3:00 pm to 3:30 pm

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CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 3
Room: California . . . . . Wed 1:20 to 3:00 pm

Perception Metrology

Session Chair: **Frank W. Samuelson,** U.S. Food and Drug Administration (USA)

1:20 pm: **Semi-parametric estimation of the area under the precision-recall curve**, Berkman Sahiner, Weijie Chen, Aria X. Pezeshk, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . [9787-10]

1:40 pm: **Proper bi-beta ROC model: algorithm, software, and performance evaluation**, Weijie Chen, U.S. Food and Drug Administration (USA); Nan Hu, The Univ. of Iowa (USA) . . . . . [9787-11]

2:00 pm: **MRMC analysis of agreement studies**, Brandon D. Gallas, U.S. Food and Drug Administration (USA); Amrita Anam, U.S. Food and Drug Administration (USA) and Univ. of Maryland, Baltimore County (USA); Weijie Chen, Adam Wunderlich, Zhiwei Zhang, U.S. Food and Drug Administration (USA) . . . . . [9787-12]

2:20 pm: **Quality metrics can help the expert during neurological clinical trials**, Laure Mahé, Univ. de Nantes (France) and KEOSYS (France); Florent Autrusseau, Hubert Desal, Jean-Pierre V. Guédon, Yves Le Teurnier, Univ. de Nantes (France); Henri Der Sarkissian, Sylvie Davila, Jérôme Beranger, KEOSYS (France) . . . . . [9787-13]

2:40 pm: **Performance comparison of semantics and lung-RADS in the National Lung Screening Trial**, Qian Li, Tianjin Medical Univ. (China) and H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Yoganand Balagurunathan, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Ying Liu, Tianjin Medical Univ. (China) and H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Matthew Schabath, Robert J. Gillies, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) . . . . . [9787-14]

Coffee Break. . . . Wed 3:00 pm to 3:30 pm

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 5
Room: Royal Palm One . Wed 1:20 to 3:20 pm

fMRI

Session Chairs: **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA); **Barjor Gimi,** Dartmouth Hitchcock Medical Ctr. (USA)

1:20 pm: **Mutual connectivity analysis (MCA) using generalized radial basis function neural networks for nonlinear functional connectivity network recovery in resting-state functional MRI**, Adora M. D'Souza, Anas Z. Abidin, Mahesh B. Nagarajan, Axel Wismüller M.D., Univ. of Rochester Medical Ctr. (USA) . . . . . [9788-19]

1:40 pm: **Large-scale Granger causality analysis on resting state functional MRI**, Adora M. D'Souza, Anas Z. Abidin, Univ. of Rochester Medical Ctr. (USA); Lutz Leistritz, Friedrich-Schiller-Univ. Jena (Germany); Axel Wismüller M.D., Univ. of Rochester Medical Ctr. (USA) . . . [9788-20]

2:00 pm: **Examining the neural correlates of depressive and motor symptoms in Parkinson's disease using Frequency Component Analysis (FCA)**, Xiaopeng Song, Peking Univ. (China); Xiao Hu, The Affiliated Brain Hospital, Nanjing Medical Univ. (China); Shuqin Zhou, Peking Univ. (China); Yijun Liu, Peking Univ, (China); Weiguo Liu, The Affiliated Brain Hospital, Nanjing Medical Univ. (China) . . . . . [9788-21]

2:20 pm: **Detecting altered connectivity patterns in HIV-associated neurocognitive impairment using mutual connectivity analysis**, Anas Z. Abidin, Adora M. D'Souza, Mahesh B. Nagarajan, Axel Wismüller M.D., Univ. of Rochester Medical Ctr. (USA) . . . [9788-22]

2:40 pm: **Evaluating effects of methylphenidate on brain activity in cocaine addiction: a machine-learning approach**, Irina Rish, IBM Thomas J. Watson Research Ctr. (USA); Pouya Bashivan, The Univ. of Memphis (USA); Guillermo A. Cecchi, IBM Thomas J. Watson Research Ctr. (USA); Rita Goldstein, Mount Sinai Hospital (USA) . . . . . .[9788-23]

Coffee Break. . . . Wed 3:20 pm to 3:30 pm

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CONFERENCE 9791
Digital Pathology

Room: Golden West

SESSION 1
Room: Golden West . . . . Wed 1:20 to 3:00 pm

Keynote and Trends

Session Chairs: **Metin N. Gurcan,** The Ohio State Univ. Wexner Medical Ctr. (USA); **Anant Madabhushi,** Case Western Reserve Univ. (USA)

1:20 pm: **Current challenges in digital pathology** *(Keynote Presentation)*, Kenneth J. Bloom, Clarient, Inc. (USA) . . . . . .[9791-1]

2:20 pm: **Automated robust registration of grossly misregistered whole-slide images with varying stains**, Geert J. S. Litjens, Hamamatsu TIGA Ctr. (Germany) and Steinbeis-Transferzentrum Medizinische Systembiologie (Germany); Kai Safferling, Niels Grabe, Hamamatsu TIGA Ctr. (Germany) and Nationales Centrum für Tumorerkrankungen Heidelberg (Germany) and Steinbeis-Transferzentrum Medizinische Systembiologie (Germany) . . . . . [9791-2]

2:40 pm: **Model coupling for predicting a developmental patterning process**, Bülent Yener, Rensselaer Polytechnic Institute (USA); Nimit Dhulekar, The MathWorks, Inc. (USA); Basak Oztan, American Science and Engineering, Inc. (USA) . . . . . [9791-3]

Coffee Break. . . . Wed 3:00 pm to 3:30 pm

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WEDNESDAY 2 MARCH

CONFERENCE 9783
Physics of Medical Imaging
Room: Town & Country

SESSION 15
Room: Town & Country . Wed 3:30 to 5:30 pm

Task Driven Imaging, Observers, Detectability, Phantom Studies

Session Chairs: **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Anders Tingberg,** Lund Univ. (Sweden)

3:30 pm: **Task-driven tube current modulation and regularization design in computed tomography with penalized-likelihood reconstruction**, Grace J. Gang, Jeffrey H. Siewerdsen, Joseph W. Stayman, Johns Hopkins Univ. (USA) . . . . . [9783-75]

3:50 pm: **Design, fabrication, and implementation of voxel-based 3D printed textured phantoms for task-based image quality assessment in CT**, Justin B. Solomon, Duke Univ. School of Medicine (USA); Alexandre H. Ba, Institut Univ. de Radiophysique Appliquée (Switzerland); Andrew Diao, Duke Univ. (USA); Joseph Y. Lo, Elianna Bier, Duke Univ. School of Medicine (USA); François O. Bochud, Institut Univ. de Radiophysique Appliquee (Switzerland); Michael E. Gehm, Duke Univ. (USA); Ehsan Samei, Duke Univ. School of Medicine (USA). . . . . [9783-76]

4:10 pm: **Detectable change of lung nodule volume with CT in a phantom study with high- and low-contrast tasks**, Marios A. Gavrielides, Qin Li, Rongping Zeng, Qi Gong, Kyle J. Myers, Berkman Sahiner, Nicholas A. Petrick, U.S. Food and Drug Administration (USA). . . . . [9783-77]

4:30 pm: **Investigation of optimal parameters for penalized maximum-likelihood reconstruction applied to iodinated contrast-enhanced breast CT**, Andrey V. Makeev, Lynda C. Ikejimba, U.S. Food and Drug Administration (USA); Joseph Y. Lo, Duke Univ. (USA); Stephen J. Glick, U.S. Food and Drug Administration (USA). . . . . [9783-78]

4:50 pm: **Predicting detection performance with model observers: Fourier domain or spatial domain?**, Baiyu Chen, Lifeng Yu, Shuai Leng, James Kofler, Christopher P. Favazza, Thomas J. Vrieze, Cynthia H. McCollough, Mayo Clinic (USA). . . . . [9783-79]

5:10 pm: **Assessing task performance in FFDM, DBT and synthetic mammography using uniform and anthropomorphic physical phantoms**, Lynda C. Ikejimba, Duke Univ. Medical Ctr. (USA); Stephen J. Glick, U.S. Food and Drug Administration (USA); Ehsan Samei, Joseph Y. Lo, Duke Univ. Medical Ctr. (USA). . . . . [9783-80]

CONFERENCE 9783 ENDS

CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 8
Room: San Diego . . . . . Wed 3:30 to 5:30 pm

Machine Learning

Session Chair: **Murray H. Loew,** The George Washington Univ. (USA); **Hayit Greenspan,** Tel Aviv Univ. (Israel)

3:30 pm: **Slide specific models for segmentation of differently stained digital histopathology whole slide images**, Nicolas Brieu, Olivier Pauly, Johannes Zimmermann, Gerd Binnig, Günter Schmidt, Definiens AG (Germany) . . . . . [9784-35]

3:50 pm: **Relative value of diverse brain MRI and blood-based biomarkers for predicting cognitive decline in the elderly**, Sarah Madsen, Greg Ver Steeg, The Univ. of Southern California (USA); Madelaine Daianu, Univ. of California, Los Angeles (USA); Adam Mezher, Neda Jahanshad, Talia M. Nir, Xue Hua, Boris A. Gutman, Aram Galstyan, Paul M. Thompson, The Univ. of Southern California (USA) . . . . . [9784-36]

4:10 pm: **Measuring glomerular number from kidney MRI images**, Jayaraman J. Thiagarajan, Lawrence Livermore National Lab. (USA); Karthikeyan Natesan Ramamurthy, IBM Thomas J. Watson Research Ctr. (USA); Berkay Kanberoglu, David H. Frakes, Kevin M. Bennett, Andreas S. Spanias, Arizona State Univ. (USA) . . . . . [9784-37]

4:30 pm: **Response monitoring using quantitative ultrasound methods and supervised dictionary learning in locally advanced breast cancer**, Mehrdad J. Gangeh, Univ. of Toronto (Canada); Brandon Fung, Sunnybrook Research Institute (Canada); Hadi Tadayyon, Univ. of Toronto (Canada); William T. Tran, Sunnybrook Research Institute (Canada); Gregory J. Czarnota, Sunnybrook Health Sciences Ctr. (Canada). . . . . [9784-38]

4:50 pm: **Deeply learnt hashing forests for content based image retrieval in prostate MR images**, Amit Shah, Sailesh Conjeti, Nassir Navab, Amin Katouzian, Technische Univ. München (Germany) . . . . . [9784-39]

5:10 pm: **A high-throughput mouse phenotyping framework using robust principal component analysis**, Zhongliu Xie, Imperial College London (UK); Asanobu Kitamoto, National Institute of Informatics (Japan); Masaru Tamura, RIKEN (Japan); Toshihiko Shiroishi, National Institute of Genetics (Japan); Duncan F. Gillies, Imperial College London (UK) . . . . . [9784-40]

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CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment
Room: California

SESSION 4
Room: California . . . . . Wed 3:30 to 5:30 pm

Perception

Session Chair: **Claudia R. Mello-Thoms,** The Univ. of Sydney (Australia)

3:30 pm: **The classification of normal screening mammograms**, Zoey Z. Y. Ang, Mohammad A. Rawashdeh, Patrick C. Brennan, Robert Heard, Warwick B. Lee, Sarah J. Lewis, The Univ. of Sydney (Australia) . . . . . [9787-15]

3:50 pm: **The potential of pigeons as surrogate observers in medical image perception studies**, Elizabeth A. Krupinski, The Univ. of Arizona (USA); Richard M. Levenson, UC Davis Medical Ctr. (USA); Victor Navarro, Edward A. Wasserman, The Univ. of Iowa (USA) . . . . . [9787-16]

4:10 pm: **The impact of radiology expertise upon the localization of subtle pulmonary lesions**, John W. Robinson, Patrick C. Brennan, Claudia R. Mello-Thoms, Sarah J. Lewis, The Univ. of Sydney (Australia). . . . . [9787-17]

4:30 pm: **Semantics to predict cancer status in lung nodules**, Ying Liu, Tianjin Medical Univ. (China) and H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Yoganand Balagurunathan, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Thomas Atwater, Sanja Antic, Vanderbilt Univ. (USA); Qian Li, Tianjin Medical Univ. (China) and H. Lee Moffitt Cancer Ctr. & Research Institute (USA); Ronald C. Walker, Gary Smith, Pierre Massion, Vanderbilt Univ. (USA); Mathew Schabath, Robert J. Gillies, H. Lee Moffitt Cancer Ctr. & Research Institute (USA). . . . . [9787-18]

4:50 pm: **Shapelet analysis of pupil dilation for modeling visuo-cognitive behavior in screening mammography**, Folami T. Alamudun, Texas A&M Univ. (USA); Hong-Jun Yoon, Oak Ridge National Lab. (USA); Tracy Hammond, Texas A&M Univ. (USA); Kathleen Hudson, The Univ. of Tennessee Medical Ctr. (USA); Garnetta Morin-Ducote, The Univ. of Tennessee (USA); Georgia D. Tourassi, Oak Ridge National Lab. (USA) . . . . . [9787-19]

5:10 pm: **Image similarity ranking of focal computed tomography liver lesions using a 2AFC technique**, Jessica Faruque, Sameer K. Antani, Rodney Long, Lauren Kim, George R. Thoma, National Institutes of Health (USA). . . . . [9787-20]

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 6
Room: Royal Palm One . Wed 3:30 to 5:30 pm

Optical

Session Chairs: **Yu Chen,** Univ. of Maryland, College Park (USA); **Baohong Yuan,** The Univ. of Texas at Arlington (USA)

3:30 pm: **Voxel based morphometry in optical coherence tomography: validation and core findings**, Bhavna J. Antony, Johns Hopkins Univ. (USA); Min Chen, Univ. of Pennsylvania (USA); Aaron Carass, Bruno M. Jedynak, Omar Al-Louzi, Sharon D. Solomon, Shiv Saidha, Peter A. Calabresi, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9788-24]

3:50 pm: **Multiple pinhole collimator based microscopic x-ray luminescence computed tomography**, Wei Zhang, Dianwen Zhu, Changqing Li, Univ. of California, Merced (USA) . . . . . [9788-25]

4:10 pm: **Optimization and performance evaluation of a conical mirror-based fluorescence molecular tomography imaging system**, Yue Zhao, Wei Zhang, Dianwen Zhu, Changqing Li, Univ. of California, Merced (USA) . . . . . [9788-26]

4:30 pm: **Compressive sensing-based preclinical molecular optical tomography**, Xavier Intes, Rensselaer Polytechnic Institute (USA). . . . . [9788-27]

4:50 pm: **A novel reconstruction algorithm for bioluminescent tomography based on Bayesian compressive sensing**, Yaqi Wang, Jinchao Feng, Kebin Jia, Zhonghua Sun, Huijun Wei, Beijing Univ. of Technology (China) . . . . . [9788-28]

5:10 pm: **Modulation of fluorescence via ultrasound-switchable fluorescence for deep-tissue high-resolution imaging**, Baohong Yuan, Jayanth Kandukuri, Bingbing Cheng, Shuai Yu, The Univ. of Texas at Arlington (USA); Venugopal Bandi, Univ. of North Texas (USA); Kytai T. Nguyen, Yi Hong, The Univ. of Texas at Arlington (USA); Francis D'Souza, Univ. of North Texas (USA) . . . . . [9788-81]

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CONFERENCE 9791
Digital Pathology
Room: Golden West

SESSION 2
Room: Golden West . . . . Wed 3:30 to 5:30 pm

Precision Medicine and Grading

Session Chair: **John E. Tomaszewski M.D.,** Univ. at Buffalo (USA)

3:30 pm: **Classification of breast cancer stroma as a tool for prognosis**, Sara Reis, Univ. College London (UK); Patrycja Gazinska, King's College London (UK); John H. Hipwell, Thomy Mertzanidou, Univ. College London (UK); Kalnisha Naidoo, The Institute of Cancer Research (UK); Sarah Pinder, King's College London (UK); David J. Hawkes, Univ. College London (UK) . [9791-4]

3:50 pm: **Automated tubule nuclei quantification on ER+ breast cancer images: Comparison with Oncotype DX risk categories**, David E. Romo-Bucheli, Univ. Nacional de Colombia (Colombia); Andrew Janowczyk, Case Western Reserve Univ. (USA); Eduardo Romero Castro, Univ. Nacional de Colombia (Colombia); Hannah L. Gilmore M.D., Univ. Hospitals Case Medical Ctr. (USA); Anant Madabhushi, Case Western Reserve Univ. (USA) [9791-5]

4:10 pm: **Computer-assisted bladder cancer grading: α-shapes for color space decomposition**, Muhammad Khalid Khan Niazi, Anil V. Parwani M.D., The Ohio State Univ. Medical Ctr. (USA); Metin N. Gurcan, The Ohio State Univ. Wexner Medical Ctr. (USA) . . . . . [9791-6]

4:30 pm: **Multi-instance multi-label learning for whole slide breast histopathology**, Caner Mercan, Bilkent Univ. (Turkey); Ezgi Mercan, Univ. of Washington (USA); Selim Aksoy, Bilkent Univ. (Turkey); Linda G. Shapiro, Univ. of Washington (USA). . . . . [9791-7]

4:50 pm: **Intraoperative neuropathology of glioma recurrence: cell detection and classification**, Fazly S. Abas, The Ohio State Univ. (USA) and Multimedia Univ. (Malaysia); Hamza N. Gokozan, Univ. Hospitals of Cleveland (USA); Behiye Goksel, Jose J. Otero, Metin N. Gurcan, The Ohio State Univ. (USA) . . . . . [9791-8]

5:10 pm: **Preliminary evaluation of a fully-automated quantitative framework for characterizing general breast tissue histology via color histogram and color texture analysis**, Brad M. Keller, Aimilia Gastounioti, Rebecca C. Batiste, Despina Kontos, Michael D. Feldman, Univ. of Pennsylvania School of Medicine (USA) . . . . . [9791-9]

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THURSDAY 3 MARCH

CONFERENCE 9784

Image Processing

Room: San Diego

SESSION 9

Room: San Diego . . . . . Thu 8:00 to 9:40 am

Model-based Image Analysis and Image Synthesis

Session Chair: **Jerry L. Prince,** Johns Hopkins Univ. (USA)

8:00 am: **On the fallacy of quantitative segmentation for T1-weighted MRI**, Andrew J. Plassard, Robert L. Harrigan, Allen T. Newton, Vanderbilt Univ. (USA); Swati Rane, Univ. of Washington (USA); Srivastan Pallavaram, Pierre F. D'Haese, Benoit M. Dawant, Daniel O. Claassen, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9784-41]

8:20 am: **Computed tomography synthesis from magnetic resonance images of the pelvic region by a combination of random classification and regression forests and auto-context features**, Daniel Andreasen, Technical Univ. of Denmark (Denmark) and Gentofte and Herlev Hospital (Denmark); Jens M. Edmund, Gentofte and Herlev Hospital (Denmark); Vasileios Zografos, Bjoern H. Menze, Technische Univ. München (Germany); Koen Van Leemput, Technical Univ. of Denmark (Denmark) and A.A. Martinos Ctr. for Biomedical Imaging, Massachusetts General Hospital (USA) . . . . . [9784-42]

8:40 am: **Endoscopic-CT: learning-based photometric reconstruction for endoscopic sinus surgery**, Austin Reiter, Simon Leonard, Ayushi Sinha, Masaru Ishii, Russell H. Taylor, Gregory D. Hager, Johns Hopkins Univ. (USA) . . . . . [9784-43]

9:00 am: **Framework for quantitative evaluation of 3D vessel segmentation approaches using vascular phantoms in conjunction with 3D landmark localization and registration**, Stefan Wörz, Deutsches Krebsforschungszentrum (Germany) and Ruprecht-Karls-Univ. Heidelberg (Germany); Philipp Hoegen, UniversitätsKlinikum Heidelberg (Germany); Wei Liao, Ruprecht-Karls-Univ. Heidelberg (Germany); Matthias Müller-Eschner, Hans-Ulrich Kauczor, UniversitätsKlinikum Heidelberg (Germany); Hendrik von Tengg-Kobligk, Inselspital Bern (Switzerland); Karl Rohr, Ruprecht-Karls-Univ. Heidelberg (Germany). . [9784-44]

9:20 am: **Learning of anatomical views and measurements from redundant but inconsistent reference data for 3D sonograpic fetal brain screening**, Irina Waechter-Stehle, Tobias Klinder, Cristian Lorenz, Philips Research (Germany); Jean Michel Rouet, Philips France (France); David Roundhill, Gary Andrews, Philips Ultrasound, Inc. (USA); Angelo Cavallaro, Raffaele Napolitano, Malid Molloholli, Tess Norris, Univ. of Oxford (UK); Aris Papageorghiou, Univ. of Oxford (UK) . . . . . [9784-45]

POSTER AWARDS SESSION

Room: San Diego . . . . . .9:40 am to 9:45 am

The Image Processing conference poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . Thu 9:45 am to 10:10 am

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CONFERENCE 9787

Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 5

Room: California . . . . . Thu 8:00 to 9:40 am

Keynote and ROC Analysis

Session Chairs: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA); **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (USA)

8:00 am: **Image perception foundation of success for NLST** *(Keynote Presentation)*, Francine L. Jacobson, Brigham and Women's Hospital (USA) . . . . . [9787-1]

Coffee Break . . . . . Wed 8:40 am to 9:00 am

9:00 am: **Minimum detectable change in size of pulmonary nodules with chest tomosynthesis: a human observer study using simulated nodules**, Christina Söderman, Åse A. Johnsson, Jenny Vikgren, Rauni Rossi Norrlund, David Molnar, Angelica Svalkvist, Lars G. Månsson, Magnus Båth, Univ. of Gothenburg (Sweden) and Sahlgrenska Univ. Hospital (Sweden) . . . . . [9787-2]

9:20 am: **Assessing nodule detection on lung cancer screening CT: the effects of tube current modulation and model observer selection on detectability maps,** John M. Hoffman, Univ. of California, Los Angeles (USA); Frédéric Noo, The Univ. of Utah (USA); Kyle McMillan, Stefano Young, Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA) . . . . . [9787-3]

POSTER AWARDS SESSION

Room: California . . . . . .9:40 am to 9:45 am

The Image Perception, Observer Performance, and Technology Assessment conference poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . Thu 9:40 am to 10:10 am

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CONFERENCE 9788

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 7

Room: Royal Palm One . . . . . Thu 8:00 to 9:40 am

Fluids and Cardiovascular

Session Chairs: **Armando Manduca,** Mayo Clinic (USA); **Robert C. Molthen,** Medical College of Wisconsin (USA)

8:00 am: **MPI as high-temporal resolution imaging technique for in vivo bolus tracking of Ferucarbotran in mouse model**, Caroline Jung, Johannes Salamon, Martin Hofmann, Michael G. Kaul, Gerhard Adam, Harald Ittrich, Tobias Knopp, Univ. Hospital Hamburg-Eppendorf (Germany) . . . . . [9788-30]

8:20 am: **A dual energy CT study on vascular effects of gold nanoparticles in radiation therapy**, Jeffrey Ashton, Melodi Whitley, Everett Moding, David G. Kirsch, Duke Univ. School of Medicine (USA); Jennifer L. West, Cristian T. Badea, Duke Univ. (USA) . . . [9788-31]

8:40 am: **Analysis of cardiac interventricular septum motion in different respiratory states**, Lennart Tautz, Fraunhofer MEVIS (Germany); Li Feng, Ricardo Otazo, New York Univ. Langone Medical Ctr. (USA); Anja B. Hennemuth, Fraunhofer MEVIS (Germany); Leon Axel, New York Univ. Langone Medical Ctr. (USA) . . [9788-32]

9:00 am: **Comprehensive serial study of dynamic remodeling of atherosclerotic coronary arteries using intravascular ultrasound**, Zhi Chen, Andreas Wahle, Ling Zhang, The Univ. of Iowa (USA); Tomas Kovarnik, Charles Univ. in Prague (Czech Republic); John J. Lopez, Loyola Univ. Chicago (USA); Milan Sonka, The Univ. of Iowa (USA) . . . . . [9788-33]

9:20 am: **Motion correction for improving the accuracy of myocardial perfusion CT imaging**, Jed D. Pack, Zhye Yin, GE Global Research (USA); Guanglei Xiong, Simon I. Dunham, Kimberly D. Elmore, Dalio Institute of Cardiovascular Imaging (USA) and Weill Cornell Medical College (USA); Peter M. Edic, GE Global Research (USA); James K. Min M.D., Dalio Institute of Cardiovascular Imaging (USA) and Weill Cornell Medical College (USA) . . . . . [9788-34]

Coffee Break . . . . . Thu 9:40 am to 10:10 am

9788 continues on page 61

CONFERENCE 9791

Digital Pathology

Room: Golden West

SESSION 3

Room: Golden West . . . . . Thu 8:00 to 9:40 am

Detection and Segmentation

Session Chair: **Anne L. Martel,** Sunnybrook Research Institute (Canada)

8:00 am: **Hotspot detection in pancreatic neuroendocrine tumors: Density approximation by α-shape maps**, Muhammad Khalid Khan Niazi, The Ohio State Univ. Medical Ctr. (USA); Douglas J. Hartman M.D., Liron Pantanowitz M.D., Univ. of Pittsburgh Medical Ctr. (USA); Metin N. Gurcan, The Ohio State Univ. Medical Ctr. (USA) . . . . . [9791-10]

8:20 am: **Adaptive local thresholding for robust nucleus segmentation using shaper prior**, Shawn Wang, Chukka Srinivas, Christophe Chefd'hotel, Ventana Medical Systems, Inc. (USA) . . . . . [9791-11]

8:40 am: **Non-uniform object counting method in large-format pyramid images applied to CD31 vessel counting in whole-mount digital pathology sections**, Mayan Murray, Melissa L. Hill, Kela Liu, James G. Mainprize, Sunnybrook Research Institute (Canada); Martin J. Yaffe, Sunnybrook Research Institute (Canada) and Univ. of Toronto (Canada) . . . . . [9791-12]

9:00 am: **Segmentation of vessel structures in serial whole slide sections using region-based context features**, Michael Schwier, Horst K. Hahn, Fraunhofer MEVIS (Germany); Uta Dahmen, Friedrich-Schiller-Univ. Jena (Germany); Olaf Dirsch, Chemnitz Central Hospital (Germany) . . . . . [9791-13]

9:20 am: **Automated quantification of glomeruli features in renal pathology**, Brandon Ginley, Univ. at Buffalo (USA); Piyush Tripathi, Feng Chen, Washington Univ. in St. Louis (USA); Edwin Anand, John E Tomaszewski M.D., Pinaki Sarder, Univ. at Buffalo (USA) . . . . . [9791-14]

Coffee Break . . . . . Thu 9:40 am to 10:10 am

POSTER AWARDS SESSION

Room: Golden West . . . . . 9:40 am to 9:45 am

The Digital Pathology conference poster award recipients will be recognized and certificates distributed.

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THURSDAY 3 MARCH

CONFERENCE 9784

Image Processing

Room: San Diego

SESSION 10

Room: San Diego . . . . . Thu 10:10 am to 12:10 pm

Segmentation

Session Chair: **Aaron Fenster,** Robarts Research Institute (Canada); **Koen Van Leemput,** Massachusetts General Hospital (USA)

10:10 am: **Breast segmentation in MRI using Poisson surface reconstruction initialized with random forest edge detection**, Anne L. Martel, Sunnybrook Research Institute (Canada); Cristina Gallego-Ortiz, Univ. of Toronto (Canada); Yingli Lu, Sunnybrook Research Institute (Canada) . . . . . .[9784-46]

10:30 am: **Simultaneous segmentation of retinal surfaces and microcystic macular edema in SDOCT volumes**, Bhavna J. Antony, Andrew Lang, Johns Hopkins Univ. (USA); Emily K. Swingle, The Ohio State Univ. (USA); Omar Al-Louzi, Aaron Carass, Sharon D. Solomon, Peter A. Calabresi, Shiv Saidha, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . .[9784-47]

10:50 am: **A generative model for segmentation of tumor and organs-at-risk for radiation therapy planning of glioblastoma patients** , Mikael Agn, Oula Puonti, Technical Univ. of Denmark (Denmark); Ian Law, Per Munck af Rosenschöld, Rigshospitalet (Denmark); Koen Van Leemput, Technical Univ. of Denmark (Denmark) and Martinos Ctr. for Biomedical Imaging, Harvard Medical School (USA) . . . . . .[9784-48]

11:10 am: **Optimal retinal cyst segmentation from OCT images**, Ipek Oguz, Li Zhang, Michael D. Abràmoff, Milan Sonka, The Univ. of Iowa (USA) . . . . . .[9784-49]

11:30 am: **Simultaneous macula detection and optic disc boundary segmentation in retinal fundus images**, Fantin Girard, Ecole Polytechnique de Montreal (Canada); Conrad Kavalec, St. Mary's Hospital Ctr. (Canada); Sébastien Grenier, Ecole Polytechnique de Montréal (Canada); Houssem Ben Tahar, DIAGNOS Inc. (Canada); Farida Cheriet, Ecole Polytechnique de Montréal (Canada) . . . . . .[9784-50]

11:50 am: **Structural functional associations of the orbit in thyroid eye disease: Kalman filters to track extraocular muscles**, Shikha Chaganti, Katrina M. Nelson, Vanderbilt Univ. (USA); Kevin Mundy, Vanderbilt Univ. Medical Ctr. (USA); Yifu Luo, Robert L. Harrigan, Stephen M. Damon, Daniel Fabbri, Vanderbilt Univ. (USA); Louise A. Mawn, Vanderbilt Univ. Medical Ctr. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9784-51]

Lunch Break . . . . . Thu 12:10 pm to 1:20 pm

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CONFERENCE 9787

Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 6

Room: California . . . . . Thu 10:10 am to 12:10 pm

Model Observers II: Search

Session Chairs: **Howard C. Gifford,** Univ. of Houston (USA); **Subok Park,** U.S. Food and Drug Administration (USA)

10:10 am: **Ranking inconsistencies in the assessment of digital breast tomosynthesis (DBT) reconstruction algorithms using a location-known task and a search task**, Xin He, Rongping Zeng, Frank W. Samuelson, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . . .[9787-26]

10:30 am: **Model observer design for detecting multiple abnormalities in anatomical background images**, Gezheng Wen, The Univ. of Texas at Austin (USA) and U.S. Food and Drug Administration (USA) and The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); Mia K. Markey, The Univ. of Texas at Austin (USA) and The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); Subok Park, U.S. Food and Drug Administration (USA) . . . . . .[9787-27]

10:50 am: **Visual-search observers for SPECT simulations with clinical backgrounds**, Howard C. Gifford, Univ. of Houston (USA) . . . . . .[9787-28]

11:10 am: **Three scenarios of location-known detection and search performance ranking inconsistencies: a collection of experimental findings after an initial exploration of the underlying mechanism**, Xin He, Frank W. Samuelson, Rongping Zeng, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . . .[9787-29]

11:30 am: **Investigation on location-dependent detectability of a small mass for digital breast tomosynthesis evaluation**, Changwoo Lee, Jongduk Baek, Yonsei Univ. (Korea, Republic of); Subok Park, U.S. Food and Drug Administration (USA) . . . .[9787-30]

11:50 am: **Machine-learning model observer for detection and localization tasks in clinical SPECT-MPI**, Felipe M. Parages, Illinois Institute of Technology (USA); J. Michael O'Connor, Univ. of Massachusetts Lowell (USA); Hendrik P. Pretorius, Univ. of Massachusetts Medical School (USA); Jovan G. Brankov, Illinois Institute of Technology (USA) .[9787-31]

Lunch Break . . . . . Thu 12:10 pm to 1:20 pm

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CONFERENCE 9788

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 8

Room: Royal Palm One . . . . . Thu 10:10 am to 12:10 pm

Cancer Imaging

Session Chairs: **Barjor Gimi,** Dartmouth Hitchcock Medical Ctr. (USA); **Baohong Yuan,** The Univ. of Texas at Arlington (USA)

10:10 am: **Multimodal in vivo imaging of tumor xenografts using novel receptor-targeted peptide tracers**, Sarah Erdmann, Nicola Beindorff, Eva J. Koziolek, Juan D. Castillo Gómez, Sandy Hallmann, Asja Wagener, Sebastian Bandholtz, Winfried Brenner, Carsten Grötzinger, Charité Universitätsmedizin Berlin (Germany) . . . . . .[9788-35]

10:30 am: **Predicting response before initiation of neoadjuvant chemotherapy in breast cancer using new methods for the analysis of dynamic contrast enhanced MRI (DCE MRI) data**, Julio Cárdenas-Rodríguez, Joseph DeGrandchamp, The Univ. of Arizona (USA) . . . . . .[9788-36]

10:50 am: **Hyperspectral imaging of neoplastic progression in a mouse model of oral carcinogenesis**, Baowei Fei, Guolan Lu, Xulei Qin, Dongsheng Wang, Emory Univ. (USA); Susan Muller M.D., Emory Univ. School of Medicine (USA); Hongzheng Zhang, Emory Univ. (USA); Amy Y. Chen, Emory Univ. School of Medicine (USA); Georgia Z. Chen, Emory Univ. (USA) . . . . . .[9788-37]

11:10 am: **Superpixel-based spectral classification for the detection of head and neck cancer with hyperspectral imaging**, Baowei Fei, Emory Univ. (USA); Hyunkoo Chung, Emory Univ. School of Medicine (USA); Guolan Lu, Zhiqiang Tian, Dongsheng Wang, Georgia Z. Chen, Emory Univ. (USA) . . . . . .[9788-38]

11:30 am: **Quantitative evaluation of epigenetic modification in tumor with 18F-FAHA PET imaging**, Fiona Li, Western Univ. (Canada) and Lawson Health Research Institute (Canada) and Robarts Research Institute (Canada); Sung J. Cho, Western Univ. (Canada); Lihai Yu, Western Univ. (Canada) and Lawson Health Research Institute (Canada); Robert H. E. Hudson, Western Univ. (Canada); Leonard G. Luyt, Michael S. Kovacs, Western Univ. (Canada) and Lawson Health Research Institute (Canada); Christopher Pin, Western Univ. (Canada); James Koropatnick, Western Univ. (Canada) and Lawson Health Research Institute (Canada); Ting-Yim Lee, Western Univ. (Canada) and Lawson Health Research Institute (Canada) and Robarts Research Institute (Canada) . . . . . .[9788-39]

11:50 am: **Respiration gating and bloch fitting improve pH measurements with acidoCEST-MRI in an ovarian orthotopic tumor model**, Kyle Jones, Mark D. Pagel, Christine Howison, Edward Randtke, The Univ. of Arizona (USA) . . . . . .[9788-40]

Lunch Break . . . . . Thu 12:10 pm to 1:20 pm

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CONFERENCE 9791

Digital Pathology

Room: Golden West

SESSION 4

Room: Golden West . . . . . Thu 10:10 am to 12:10 pm

Machine Learning

Session Chairs: **Aaron D. Ward,** Western Univ. (Canada); **Josien P. W. Pluim,** Technische Univ. Eindhoven (Netherlands)

10:10 am: **Differentiation of arterioles from venules in mouse histology images using machine learning**, Sachi Elkerton, Yiwen Xu, J. Geoffrey Pickering, Aaron D. Ward, Western Univ. (Canada) . . . . . .[9791-15]

10:30 am: **Lymphoma diagnosis in histopathology using a multi-stage visual learning approach**, Noel Codella, IBM Thomas J. Watson Research Ctr. (USA); Mehdi Moradi, IBM Research - Almaden (USA); Matt Matasar, Memorial Sloan-Kettering Cancer Ctr. (USA); Tanveer F. Syeda-Mahmood, IBM Research - Almaden (USA); John R. Smith, IBM Thomas J. Watson Research Ctr. (USA). . . . . .[9791-16]

10:50 am: **Evaluating stability of histomorphometric features across scanner and staining variations: predicting biochemical recurrence from prostate cancer whole slide images,** Patrick Leo, George Lee, Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . .[9791-25]

11:10 am: **A structure-based approach for colon gland segmentation in digital pathology**, Bassem Ben Cheikh, UPMC Sorbonne Univ. (France); Philippe Bertheau, Univ. Paris Diderot (France) and Hôpital Saint-Louis (France); Daniel Racoceanu, UPMC Sorbonne Univ. (France) and INSERM (France) . . . . . .[9791-18]

11:30 am: **Miniature objective lens for array microscopy digital pathology: evaluation and improvement**, Brian P. McCall, Fresnel Technologies Inc. (USA); Mark C. Pierce, Rutgers, The State Univ. of New Jersey (USA); Edward A. Graviss, The Methodist Hospital Research Institute (USA); Rebecca Richards-Kortum, Tomasz S. Tkaczyk, Rice Univ. (USA) .[9791-19]

11:50 am: **Quantitative diagnosis of tongue cancer on histological images in an animal model**, Baowei Fei, Guolan Lu, Xulei Qin, Dongsheng Wang, Susan Muller M.D., Hongzheng Zhang, Amy Y. Chen, Georgia Z. Chen, Emory Univ. (USA) . . . . . .[9791-20]

Lunch Break . . . . . Thu 12:10 pm to 1:20 pm

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THURSDAY 3 MARCH

CONFERENCE 9784
Image Processing
Room: San Diego

SESSION 11
Room: San Diego . . . . . Thu 1:20 to 3:00 pm

Classification/Population
Session Chairs: **Baowei Fei,** Emory Univ. (USA); **Dzung L. Pham,** Henry M. Jackson Foundation (USA)

1:20 pm: **Quality assurance using outlier detection on an automatic segmentation method for the cerebellar peduncles**, Ke Li, Johns Hopkins Univ. (USA); Chuyang Ye, Brainnetome Ctr., Institute of Automation (China); Zhen Yang, Aaron Carass, Johns Hopkins Univ. (USA); Sarah H. Ying, The Johns Hopkins School of Medicine (USA); Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . .[9784-52]

1:40 pm: **A learning-based, fully automatic liver tumor segmentation pipeline based on sparsely annotated training data**, Michael Goetz, Eric Heim, Keno Maerz, Tobias Norajitra, Deutsches Krebsforschungszentrum (Germany); Mohammadreza R. Hafezi, Nassim Fard, Arianeb Mehrabi, Ruprecht-Karls-Univ. Heidelberg (Germany); Max Knoll, Christian Weber, Deutsches Krebsforschungszentrum (Germany); Lena Maier-Hein, Klaus H. Maier-Hein, Deutsches Krebsforschungszentrum (Germany). . . . . .[9784-53]

2:00 pm: **SVM-based failure detection of GHT localizations**, Thomas Blaffert, Cristian Lorenz, Hannes Nickisch, Jochen Peters, Jürgen Weese, Philips Research (Germany) . . . . . .[9784-54]

2:20 pm: **Embedded sparse representation of fMRI data via group-wise dictionary optimization**, Dajiang Zhu, Univ. of Southern California (USA); Binbin Lin, Univ. of Michigan (USA); Joshua Faskowitz, Univ. of Southern California (USA); Jieping Ye, Univ. of Michigan (USA); Paul M. Thompson, Univ. of Southern California (USA) . . . . . .[9784-55]

2:40 pm: **Genome-wide association study of coronary and aortic calcification in lung cancer screening CT**, Bob D. De Vos, Jessica Van Setten, Pim A. de Jong, Willem P. T. M. Mali, Univ. Medical Ctr. Utrecht (Netherlands); Matthijs Oudkerk, Univ. Medical Ctr. Groningen (Netherlands); Max A. Viergever, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . .[9784-56]

Coffee Break . . . . . Thu 3:00 pm to 3:30 pm

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CONFERENCE 9787
Image Perception, Observer Performance, and Technology Assessment
Room: California

SESSION 7
Room: California . . . . . Thu 1:20 to 3:00 pm

Breast Imaging II
Session Chair: **Pontus A. Timberg,** Scanias Univ. Hospital (Sweden)

1:20 pm: **Varying performance in mammographic interpretation across two countries: Do results indicate reader or population variances?**, BaoLin Pauline Soh, Singapore General Hospital (Singapore); Warwick B. Lee, BreastScreen NSW (Australia); Jill Wong, National Cancer Ctr. of Singapore (Singapore); Llewellyn Sim, Singapore General Hospital (Singapore); Stephen L. Hillis, The Univ. of Iowa (USA); Kriscia A. Tapia, Patrick C. Brennan, The Univ. of Sydney (Australia). . . . . .[9787-32]

1:40 pm: **Luminance level of a monitor: linfluence on detectability and detection rate of breast cancer in 2D mammography**, Frédéric Bemelmans, KU Leuven (Belgium); Alaleh Rashid Nasab, KU Leuven (Belgium) and Univ. College London (UK); Frédérique Chesterman, Tom R. L. Kimpe, Barco N.V. (Belgium); Hilde Bosmans, KU Leuven (Belgium) and UZ Leuven (Belgium)[9787-33]

2:00 pm: **The effectiveness of the cranio-caudal mammogram projection among radiologists**, Phuong Dung Trieu, Warwick B. Lee, Kriscia A. Tapia, Patrick C. Brennan, The Univ. of Sydney (Australia) . . . . .[9787-34]

2:20 pm: **Investigating the link between the radiological experience and the allocation of an equivocal finding**, Mohammad A. Rawashdeh, Camila Vidotti, Warwick B. Lee, Sarah J. Lewis, Claudia R. Mello-Thoms, Warren M. Reed, Kriscia A. Tapia, Patrick C. Brennan, The Univ. of Sydney (Australia) . . .[9787-35]

2:40 pm: **The interplay of attention economics and CAD marks interpretation in screening mammography**, Tayler M. Schwartz, The Warren Alpert Medical School of Brown Univ. (USA); Radhika Sridharan, UKM Medical Ctr. (Malaysia); Wei Wei, Olga Lukyanchenko, William R. Geiser, Gary J. Whitman, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); Tamara M. Haygood, The Warren Alpert Medical School of Brown Univ. (USA). . . . . .[9787-36]

Coffee Break . . . . . Thu 3:00 pm to 3:30 p

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CONFERENCE 9788
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 9
Room: Royal Palm One . . . . . Thu 1:20 to 3:00 pm

Lung
Session Chair: **Robert C. Molthen,** Medical College of Wisconsin (USA)

1:20 pm: **A semi-automatic framework of measuring pulmonary arterial metrics at anatomic airway locations using CT imaging**, Dakai Jin, The Univ. of Iowa (USA); Junfeng Guo, Timothy M. Dougherty, The Univ. of Iowa Hospitals and Clinics (USA); Krishna S. Iyer, The Univ. of Iowa Carver College of Medicine (USA); Eric A. Hoffman, The Univ. of Iowa Hospitals and Clinics (USA); Punam K. Saha, The Univ. of Iowa (USA) . . . . . .[9788-41]

1:40 pm: **Fat quantification and analysis of lung transplant patients on unenhanced chest CT images based on standardized anatomic space**, Yubing Tong, Univ. of Pennsylvania School of Medicine (USA); Jayaram K. Udupa, Drew A. Torigian, Caiyun Wu, Univ. of Pennsylvania (USA); Jason D. Christie, Univ. of Pennsylvania School of Medicine (USA); David J. Lederer, Columbia Univ. Medical Ctr. (USA) . . .[9788-42]

2:00 pm: **Patient-specific simulation of tidal breathing**, Martin A. Walters, Ian P. Jones, Andrew K. Wells, Ian S. Hamill, ANSYS UK Ltd. (UK); Bart Veeckmans, Materialise N.V. (Belgium); Wim Vos, Cedric Van Holsbeke, FLUIDDA nv (Belgium); Catalin Fetita, Christophe Lefèvre, Télécom SudParis (France) and Institut Mines-Télécom (France). . . . . .[9788-43]

2:20 pm: **Preliminary study of visualizing membrane structures of spiculated pulmonary nodules in three-dimensional thoracic CT images**, Yoshiki Kawata, Noboru Niki, The Univ. of Tokushima (Japan); Hironobu Ohmatsu, Keiju Aokage, Masahiko Kusumoto, Takaaki Tsuchida, National Cancer Ctr. Hospital East (Japan); Kenji Eguchi, Teikyou Univ. School of Medicine (Japan); Masahiro Kaneko, Tokyo Health Service Association (Japan). . . . . .[9788-44]

2:40 pm: **Robust lung identification in MSCT via controlled flooding and shape constraints: dealing with anatomical and pathological specificity**, Catalin Fetita, Sebastian R. Tarando, Télécom SudParis (France); Pierre-Yves Brillet, Univ. Paris 13 (France) and Avicenne Hospital (France); Philippe A. Grenier M.D., Univ. Paris 6 (France) and Pitié-Salpêtrière Hospital (France) . . . . . .[9788-45]

Coffee Break . . . . . Thu 3:00 pm to 3:30 pm

9788 continues on page 63

CONFERENCE 9791
Digital Pathology
Room: Golden West

SESSION 5
Room: Golden West . . . . . Thu 1:20 to 2:40 pm

Emerging Technologies
Session Chairs: **Selim Aksoy,** Bilkent Univ. (Turkey); **Scott Doyle,** Univ. at Buffalo (USA)

1:20 pm: **Multi-scale learning based segmentation of glands in digital colonrectal pathology images**, Yi Gao, Stony Brook Univ. (USA); William Liu, Buckingham Browne & Nichols School (USA); Shipra Arjun, Liangjia Zhu, Vadim Ratner, Tahsin Kurc, Joel H. Saltz M.D., Allen R. Tannenbaum, Stony Brook Univ. (USA) . . . . . .[9791-21]

1:40 pm: **3D morphological measurement of whole slide histological vasculature reconstructions**, Yiwen Xu, J. Geoffrey Pickering, The Univ. of Western Ontario (Canada); Zengxuan Nong, Robarts Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . .[9791-22]

2:00 pm: **High-resolution single pixel imaging: Pushing toward a real time hyperspectral imaging system**, Joseph A. Peller, Didier Dréau, Faramarz Farahi, Susan R. Trammell, The Univ. of North Carolina at Charlotte (USA) . . . . . .[9791-23]

2:20 pm: **Offset-sparsity decomposition for enhancement of color microscopic image of stained specimen in histopathology: further results**, Ivica Kopriva, Marijana Popović Hadžija, Mirko Hadžija, Institut Ruder Boškovic (Croatia); Gorana Aralica, Univ. Hospital Dubrava (Croatia), Univ. of Zagreb (Croatia). . . . . [9791-24]

SESSION 6
Room: Golden West . . . . . Thu 2:40 to 3:10 pm

Emerging Global Opportunities
Session Chairs: **Metin N. Gurcan,** The Ohio State Univ. Wexner Medical Ctr. (USA); **Anant Madabhushi,** Case Western Reserve Univ. (USA)

2:40 pm: **Cancer diagnostics in Africa: leapfrog technology and volunteers transform care** *(Invited Paper)*, E. Blair Holladay, American Society for Clinical Pathology (USA), Northwestern Medical School (USA); Dan Milner, Brigham and Women's Hospital (USA), Harvard Univ. (USA) . . . . . [9791-64]

CONFERENCE 9791 ENDS

CONFERENCE 9784

Image Processing

Room: San Diego

SESSION 12

Room: San Diego . . . . . Thu 3:30 to 5:10 pm

Registration

Session Chairs: **Stefan Klein,** Erasmus MC (Netherlands)**; Jayaram K. Udupa,** Univ. of Pennsylvania (USA)

3:30 pm: **Automatic localization of landmarks in partial head CT images with regression forests for image registration initialization**, Dongqing Zhang, Yuan Liu, Jack H. Noble, Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . . [9784-57]

3:50 pm: **Semi-automated registration of pre- and itntra-operative liver CT for image-guided intervetions**, Gokhan Gunay, Luu Manh Ha, Theo van Walsum, Stefan Klein, Erasmus MC (Netherlands) . . . . . [9784-58]

4:10 pm: **Evaluation of body-wise and organ-wise registrations for abdominal organs**, Zhoubing Xu, Sahil A. Panjwani, Christopher P. Lee, Ryan P. Burke, Vanderbilt Univ. (USA); Rebeccah B. Baucom, Benjamin K. Poulose, Vanderbilt Univ. Medical Ctr. (USA); Bennett A. Landman, Richard G. Abramson, Vanderbilt Univ. (USA) . . . . . [9784-59]

4:30 pm: **3D prostate MR-TRUS non-rigid registration using dual optimization with volume-preserving constraint**, Wu Qiu, Jing Yuan, Aaron Fenster, Robarts Research Institute (Canada) . . . . . [9784-60]

4:50 pm: **Robust endoscopic pose estimation for intraoperative organ-mosaicking**, Daniel Reichard, Sebastian Bodenstedt, Stefan Suwelack, Karlsruher Institut für Technologie (Germany); Martin Wagner, Hannes Kenngott, UniversitätsKlinikum Heidelberg (Germany); Beat Müller-Stich, Heidelberg School of Medicine (Germany); Rüdiger Dillmann, Stefanie Speidel, Karlsruher Institut für Technologie (Germany). [9784-61]

5:10 pm: **The heritability of the functional connectome is robust to common nonlinear registration methods**, George Hafzalla, The Univ. of Southern California (USA); Gautam Prasad, Vatche G. Baboyan, Joshua Faskowitz, Univ. of Southern California, Imaging Genetics Ctr. (USA); Neda Jahanshad, The Univ. of Southern California (USA); Katie L. McMahon, Greig I. de Zubicaray, The Univ. of Queensland (Australia); Margaret J. Wright, QIMR Berghofer Medical Research Institute (Australia); Meredith N. Braskie, Imaging Genetics Ctr. (USA); Paul M. Thompson, Univ. of Southern California, Imaging Genetics Ctr. (USA) . . . . . [9784-62]

CONFERENCE 9784 ENDS

CONFERENCE 9787

Image Perception, Observer Performance, and Technology Assessment

Room: California

SESSION 8

Room: California . . . . . Thu 3:30 to 5:30 pm

Technology Assessment

Session Chair: **Maciej A. Mazurowski,** Duke Univ. (USA)

3:30 pm: **Importance of the grayscale in early assessment of image quality gains with iterative CT reconstruction**, Frédéric Noo, The Univ. of Utah (USA); Katharin Hahn, Siemens Healthcare GmbH (Germany); Zjia Guo, The Univ. of Utah (USA) . . . . . .[9787-37]

3:50 pm: **Validation of no-reference image quality index for the assessment of digital mammographic images**, Helder C. R. de Oliveira, Bruno Barufaldi, Lucas R. Borges, Univ. de São Paulo (Brazil); Salvador Gabarda, Instituto de Óptica "Daza de Valdés" (Spain); Predrag R. Bakic, Andrew D. A. Maidment, The Univ. of Pennsylvania Health System (USA); Marcelo A. C. Vieira, Homero Schiabel, Univ. de São Paulo (Brazil) .[9787-38]

4:10 pm: **Impact of large beam collimation on image quality**, Damien Racine, Alexandre H. Ba, Julien G. Ott, François O. Bochud, Francis R. Verdun, Ctr. Hospitalier Univ. Vaudois (Switzerland) . . . . . .[9787-39]

4:30 pm: **Predicting radiologists' true and false positive decisions in reading mammograms by using gaze parameters and image-based features**, Ziba Gandomkar, Kevin Tay, William J. Ryder, Patrick C. Brennan, Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) . . . . . .[9787-40]

4:50 pm: **Quantitative image quality evaluation for cardiac CT reconstructions**, Hsin-Wu Tseng, The Univ. of Arizona (USA); Jiahua Fan, GE Healthcare (USA); Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona (USA); William H. Balhorn, Darin Okerlund, GE Healthcare (USA) . . . . . .[9787-41]

5:10 pm: **Effect of anatomical backgrounds on detectability in volumetric cone beam CT images**, Minah Han, Yonsei Univ. (Korea, Republic of); Subok Park, U.S. Food and Drug Administration (USA); Jongduk Baek, Yonsei Univ. (Korea, Republic of) . . . . . .[9787-42]

CONFERENCE 9787 ENDS

CONFERENCE 9788

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Royal Palm One

SESSION 10

Room: Royal Palm One . . . . . Thu 3:30 to 5:30 pm

Novel MR Techniques and Applications

Session Chairs: **Barjor Gimi,** Dartmouth Hitchcock Medical Ctr. (USA); **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA)

3:30 pm: **Maturation index of developing human brain based on long- and short-range association fibers**, Minhui Ouyang, Tina Jeon, The Children's Hospital of Philadelphia (USA); Virendra R. Mishra, Lou Ruvo Ctr. for Brain Health (USA); Haixiao Du, Yu Wang, Tsinghua Univ. (China); Yun Peng, Capital Medical Univ. (China); Hao Huang, The Children's Hospital of Philadelphia (USA) and Univ. of Pennsylvania School of Medicine (USA) . .[9788-46]

3:50 pm: **Perfusion deficits and functional connectivity alterations in patients with post-traumatic stress disorder**, Yang Liu, Baojuan Li, Xi Zhang, Linchuan Zhang, Liang Li, Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . [9788-47]

4:10 pm: **Monitoring fractional anisotropy in developing rabbit brain using MR diffusion tensor imaging at 3T**, Jo-Chi Jao, Kaohsiung Medical Univ. (Taiwan); Yu-Ting Yang, Fooyin Univ. Hospital (Taiwan); Chia-Chi Hsiao, Kaohsiung Veterans General Hospital (Taiwan); Po-Chou Chen, I-Shou Univ. (Taiwan) [9788-48]

4:30 pm: **A pilot DTI analysis in patients with recent onset post-traumatic stress disorder**, Yang Liu, Liang Li, Baojuan Li, Xi Zhang, Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . [9788-49]

4:50 pm: **Correlation between diffusion kurtosis and NODDI metrics in neonates and young children**, Shaheen Ahmed, Zhiyue J. Wang, Jonathan M. Chia, Nancy Rollins, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA) . . . . . .[9788-99]

5:10 pm: **Multi-site study of diffusion metric variability: characterizing the effects of site, vendor, field strength, and echo time using the histogram distance**, Karl Helmer, Athinoula A. Martinos Ctr. for Biomedical Imaging (USA) and Massachusetts General Hospital (USA); Ming-Chung Chou, Kaohsiung Medical Univ. (Taiwan); Ronny I. Preciado, Athinoula A. Martinos Ctr. for Biomedical Imaging (USA) and Massachusetts General Hospital (USA); Barjor Gimi, The Geisel School of Medicine at Dartmouth (USA); Nancy Rollins, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Allen Song, Brain Imaging and Analysis Ctr., Duke Univ. School of Medicine (USA); Jessica Turner, The MIND Research Network (USA); Susumu Mori, Johns Hopkins Univ. School of Medicine (USA) . . . . . .[9788-51]

POSTER AWARDS SESSION

Room: Royal Palm One . . . . . 5:30 pm to 5:35 pm

The Biomedical Applications in Molecular, Structural, and Functional Imaging conference poster award recipients will be recognized and certificates distributed.

CONFERENCE 9788 ENDS

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Product Order Number		Volume Title/Volume Editors	Price for separate print purchase
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9785	**DL9785**	**Medical Imaging 2016: Computer-Aided Diagnosis** *Georgia D. Tourassi, Samuel G. Armato*	**$150**
9786	**DL9786**	**Medical Imaging 2016: Image-Guided Procedures, Robotic Interventions, and Modeling** *Robert J. Webster III, Ziv R. Yaniv*	**$125**
9787	**DL9787**	**Medical Imaging 2016: Image Perception, Observer Performance, and Technology Assessment** *Craig K. Abbey, Matthew A. Kupinski*	**$80**
9788	**DL9788**	**Medical Imaging 2016: Biomedical Applications in Molecular, Structural, and Functional Imaging** *Barjor Gimi, Andrzej Krol*	**$125**
9789	**DL9789**	**Medical Imaging 2016: PACS and Imaging Informatics: Next Generation and Innovations** *Jianguo Zhang, Tessa S. Cook*	**$60**
9790	**DL9790**	**Medical Imaging 2016: Ultrasonic Imaging and Tomography** *Neb Duric, Brecht Heyde*	**$100**
9791	**DL9791**	**Medical Imaging 2016: Digital Pathology** *Metin N. Gurcan, Anant Madabhushi*	**$80**

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Product Order Number	Collection Title/Included Volumes (See next page for volume titles and editors)
Symposium Collection	
DLC602	**SPIE Medical Imaging 2016** *9783, 9784, 9785, 9786, 9787, 9788, 9789, 9790, 9791*

General Information

Registration

Onsite Registration and Badge Pick-up Hours
LocationAtlas Foyer

Saturday 27 February . . . . . 7:30 am to 4:00 pm
Sunday 28 February . . . . . 7:15 am to 4:00 pm
Monday 29 February . . . . . 7:30 am to 4:00 pm
Tuesday 1 March . . . . . 7:30 am to 4:00 pm
Wednesday 2 March . . . . . 7:30 am to 4:00 pm
Thursday 3 March . . . . . 7:30 am to 1:30 pm

Conference Registration

Includes admission to all conference sessions, plenary, panels, and poster sessions, coffee breaks, and a choice of proceedings.

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Courses and workshops are priced separately. Course-only registration includes your selected course(s), course notes, and coffee breaks. Course prices include applicable taxes. Onsite, please go to Course Materials Pick-up after you pick up your badge.

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Author / Presenter Information

Speaker Check-In and Preview Station

Location: Terrace Salon One

Saturday through Thursday. . . . . 7:30 am to 5:00 pm

All conference rooms have a computer workstation, projector, screen, lapel microphone, and laser pointer. All presenters are requested to come to Speaker Check-In with their memory devices or laptops to confirm their presentation display settings.

Poster Sessions and Set-up Instructions

Location: Grand Exhibit Hall

Sunday/Monday Poster Session

Author Setup Time. . . . . Sunday Noon to 1:30 pm
Poster Session . . . . . Monday 5:30 pm to 7:00 pm
Authors Remove Posters . . . . Monday 7:00 pm to 9:00 pm

Tuesday/Wednesday Poster Session

Author Setup Time . . . . . Tuesday 9:30 am to 11:00 am
Poster Session . . . . . Wednesday 5:30 pm to 7:00 pm
Authors Remove Posters .Wednesday 7:00 pm to 9:00 pm

- Paper numbers will be placed on the poster boards in numerical order; please find your paper number and put up your poster in the designated space.
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- Presenters must remove their posters at the end of the poster session.
- Posters not removed will be considered unwanted and will be discarded.
- SPIE assumes no responsibility for posters left up after the end of each poster session.

Onsite Services

Internet Access

Location: Grand Exhibit Hall Foyer

Sunday - Thursday

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WiFi

Location: Grand Exhibit Hall
Atlas Foyer
All Conference Rooms

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8 am – 5 pm . . . . . .7 days a week

Services include copies, print documents from your laptop or storage device, small package FedEx shipping, packing supplies, color copying services, fax services and office supplies. Prices for services are posted onsite.

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Location: Atlas Foyer

Sunday through Wednesday. 8:30 to 10:00 am and 3:00 to 4:00 pm

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Registration Hours

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Food and Beverage Services

Coffee Breaks

Saturday 27 February . . . . . .10 am and 3 pm
Location: Rose Garden Patio

Sunday 28 February . . . . . .9:30 am and 3 pm
Location: Grand Exhibit Hall

Monday, 29 February . . . . . 9:30 and 3:20 pm
Location: Grand Exhibit Hall

Tuesday 1 March . . . . . .9:30 am and 3 pm
Location: Grand Exhibit Hall

Wednesday 2 March . . . . . .9:30 am and 3 pm
Location: Grand Exhibit Hall

Thursday 3 March. . . . . .9:30 am and 3 pm
Location: Atlas Foyer

Complimentary coffee will be served twice each day of the conference. Check individual conference listings for exact times and locations.

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Terrace Café

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Market Deli

Open from 7 am to 10 pm
Specializing in light to go fare and features Starbucks coffee drinks.

Charlie's

Open from 11 am to Midnight
Sports, Beer and Barbeque

SPIE-Hosted Lunches

Location: Grand Plaza

Sunday through Thursday . . . . . .12:10 to 1:00 pm

SPIE hosted lunches will be included in registration packets for full-conference registrants Sunday through Thursday. Student attendees will receive a complimentary lunch ticket for Monday, Tuesday and Wednesday with their registration. The Sunday Student Lunch with the Experts is on a first-come, first-served basis.

Students may purchase lunch tickets for Thursday's lunch from the cashier at the SPIE Registration Desk if tickets are available. The Registration staff will be notified of available seating starting 10 minutes after the last conference room breaks, usually between 12:20 to 12:30 pm.

Should inclement weather prevent outdoor lunches, they will be served in the Grand Exhibit Hall.

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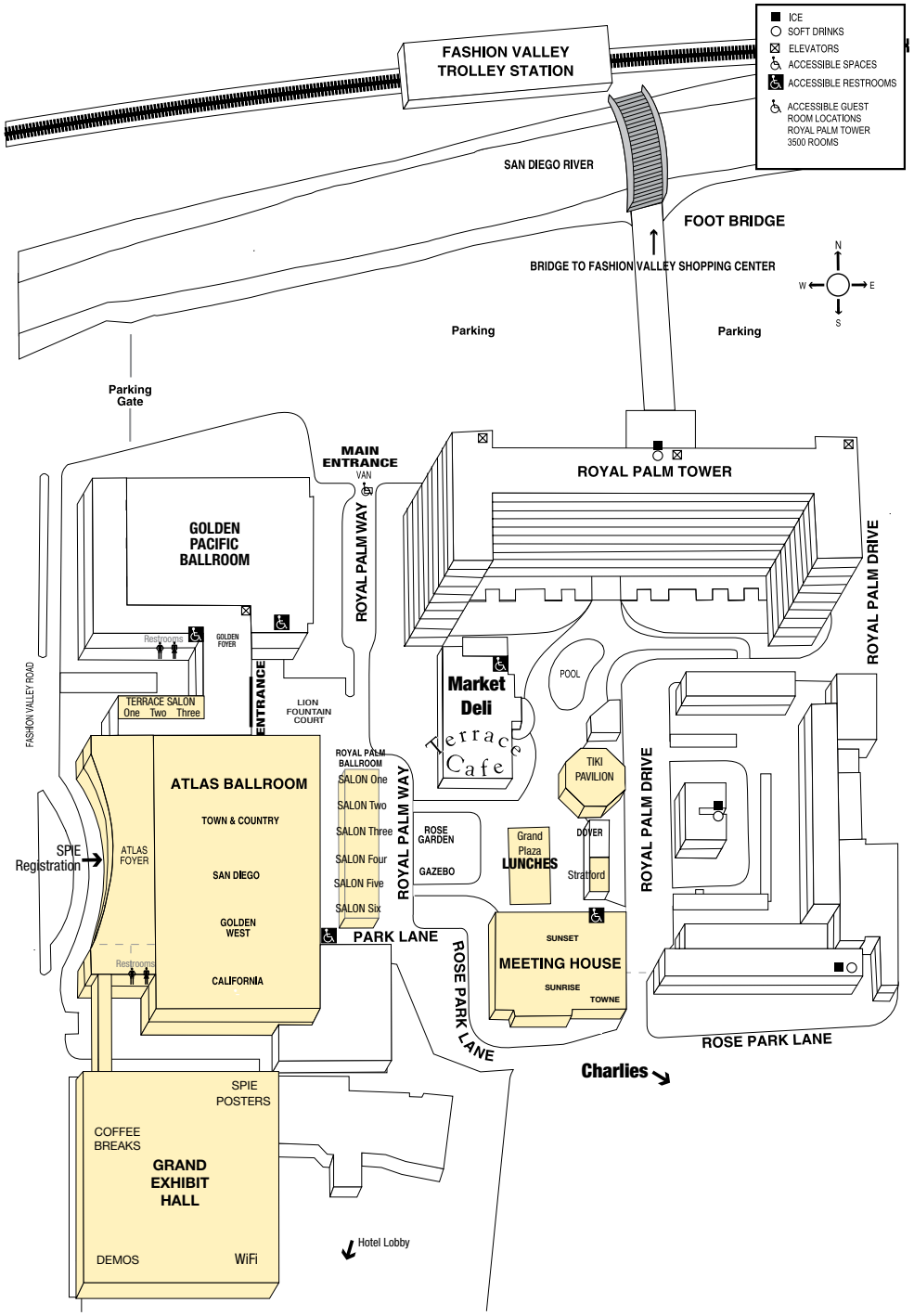

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Access to Technical and Networking Events

Persons under the age of 18 including babies, carried or in strollers, and toddlers are not allowed in technical or networking events. Anyone 18 or older must register as an attendee. All technical and networking events require a valid conference badge for admission.

Unsecured Items Policy

Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

Wireless Internet Service Policy

At SPIE events where wireless is included with your registration, SPIE provides wireless access for attendees during the conference but cannot guarantee full coverage in all locations, all of the time. Please be respectful of your time and usage so that all attendees are able to access the internet.

Excessive usage (e.g., streaming video, gaming, multiple devices) reduces bandwidth and increases cost for all attendees. No routers may be attached to the network. Properly secure your computer before accessing the public wireless network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and/or presentation. SPIE is not responsible for computer viruses or other computer damage.

Mobile Phones and Related Devices Policy

Mobile phones, tablets, laptops, pagers, and any similar electronic devices should be silenced during conference sessions. Please exit the conference room before answering or beginning a phone conversation.

Smoking

For the health and consideration of all attendees, smoking, including e-cigarettes, is not permitted at any event elements, such as but not limited to: plenaries, conferences, workshops, courses, poster sessions, hosted meal functions, receptions, and in the exhibit hall. Most facilities also prohibit smoking and e-cigarettes in all or specific areas. Attendees should obey any signs preventing or authorizing smoking in specified locations.

Hold Harmless

Attendee agrees to release and hold harmless SPIE from any and all claims, demands, and causes of action arising out of or relating to your participation in the event you are registering to participate in and use of any associated facilities or hotels.

Event Cancellation

If for some unforeseen reason SPIE should have to cancel the event, registration fees processed will be refunded to registrants. Registrants will be responsible for cancellation of travel arrangements or housing reservations and the applicable fees.

Confidential Reporting of Unethical or Inappropriate Behavior

SPIE is an organization with strong values of responsibility and integrity. Our Ethics Statement and Code of Professional Conduct contain general guidelines for conducting business with the highest standards of ethics. SPIE has established a confidential reporting system for staff and other stakeholders to raise concerns about possible unethical or inappropriate behavior within our community. Complaints may be filed by phone or through the website, and, if preferred, may be made anonymously. The web address is www.SPIE.ethicspoint.com and the toll free hotline number is 1-888-818-6898.

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