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Conferences & Courses
21–26 February 2015

Renaissance Orlando at Sea World
Orlando, Florida, USA

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AAPM—American Association of Physicists in Medicine

APS—American Physiological Society

CARS—Computer Assisted Radiology and Surgery

MIPS—Medical Image Perception Society

RSNA—Radiological Society of North America

SIIM—Society for Imaging Informatics in Medicine

WMIS—World Molecular Imaging Society

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Welcome to Orlando

On behalf of SPIE and the conference organizers, we welcome you to Medical Imaging 2015, the event where the most innovative minds gather to review advances in physics, image processing, CAD, visualization and modeling, digital pathology, ultrasonic imaging, and imaging for biomedical applications. This event covers the full range of medical imaging modalities including medical image acquisition, display, processing, analysis, perception, decision support, and informatics. Hear the work, network with leaders in the field, and see the applications of the future.

We look forward to seeing you.

Symposium Chairs:

David Manning
Lancaster Univ.
(United Kingdom)

Steven C. Horii
The Univ. of Pennsylvania Health System (USA)

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DATES
Conferences & Courses:
21-26 February 2015

LOCATION
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Orlando, Florida, 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.

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TECHNICAL CONFERENCES

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INTERNATIONAL YEAR OF LIGHT 2015

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DAILY EVENT SCHEDULE

SATURDAY 21 February

SC086 **Fundamentals of Medical Image Processing and Analysis** *(Deserno)* 8:30 am to 5:30 pm, $570 / $660, p. 20

SC1094 **ImageJ Part 1: The GUI and Macro Programming with Applications to Image Processing and Image Analysis** *(VanMetter)* 8:30 am to 12:30 pm, $360 / $410, p. 20

SC938 **Quantitative Characterization of Cancer Using in vivo Imaging** *(Yankeelov)* 8:30 am to 12:30 pm, $360 / $410, p. 20

SC1127 **ROC Analysis and Observer Studies to Evaluate Imaging Technology** *(Hillis, Nishikawa, Samuelson)* 8:30 am to 5:30 pm, $570 / $660, p. 22

SC1095 **ImageJ Part 2: Plugin Programming with Applications to Image Processing and Image Analysis** *(VanMetter)* 1:30 to 5:30 pm, $360 / $410, p. 20

SC471 **Principles and Advancements in X-ray Computed Tomography** *(Hsieh)* 1:30 to 5:30 pm, $450 / $500, p. 22

WS776 **Writing for Publication in Medical Imaging** *(Hanson)* 1:30 to 5:30 pm, $125 / $175, p. 22

SUNDAY 22 February

9412 Physics of Medical Imaging *(Hoeschen, Kontos, Flohr)* p. 24

9414 Computer-Aided Diagnosis *(Hadjiiski, Tourassi)* p. 24

9415 Image-Guided Procedures, Robotic Interventions, and Modeling *(Yaniv, Webster)* p. 24

9418 PACS and Imaging Informatics: Next Generation and Innovations *(Cook, Zhang)* p. 25

9419 Ultrasonic Imaging and Tomography *(Bosch, Duric)* p. 25

KEYNOTE PRESENTATION: **Practical Applications and Pitfalls of "Big Data" for Decision Support in Medical imaging and Informatics** (Conf. 9418) *(Siegel)* 8:00 to 9:00 am, p. 10

SC987 **Spectral CT Imaging** *(Schmidt, Flohr, Grant)* 8:30 am to 12:30 pm, $360 / $410, p. 22

KEYNOTE PRESENTATION: **Synergistic integration of photoacoustic and ultrasound computed tomography** (Conf. 9419) *(Anastasio)* 10:10 to 10:50 am, p. 10

Lunch with the Experts - A Student Networking Event, 12:10 to 1:20, p. 19

SC1129 **Photon Counting X-ray Imaging: Technology and Methods** *(Danielsson, Bornefalk)* 1:30 to 5:30 pm, $360 / $410, p. 22

SC358 **X-Ray Detector Performance and DQE: Principles and Measurements using a Linear-Systems Approach** *(Cunningham)* 1:30 to 5:30 pm, $360 / $410, p. 22

WORKSHOP 1: **Uncertainties in the Medical Imaging Chain** *(Hoeschen, Kontos, Kupinski)* 5:45 to 7:45 pm p. 14

WORKSHOP 4: **Novel Robots for Less Invasive Survey** *(Webster)* 5:45 to 7:45 pm, p. 14

WORKSHOP 7: **Radiology for the Non-Radiologist** *(Zhang)* 5:45 to 7:45 pm, p. 14

MONDAY 23 February

KEYNOTE PRESENTATION: **Role of Machine Learning in Clinical Decision Support** (Conf. 9414) *(Syeda-Mahmood)* 10:10 to 11:10 am, p. 11

PLENARY AND AWARDS SESSION
Robert F. Wagner All-Conference Best Student Paper Award, *and PLENARY PRESENTATION:* **4/5D Imaging for Guiding Intracardiac and Extracorporeal Ablation of Cardiac Arrhythmias** *(Packer)* 4:00 to 5:30 pm, p. 8-9

SC1026 **Graph Algorithmic Techniques for Biomedical Image Segmentation** *(Garvin, Wu)* 1:30 to 5:30 pm, $360 / $410, p. 22

Interactive Poster Session and Reception, 5:30 to 7:00 pm, p. 16

TUESDAY 24 February

9413 Image Processing *(Ourselin, Styner)* p. 24

9417 Biomedical Applications in Molecular, Structural, and Functional Imaging *(Gimi, Molthen)* p. 25

KEYNOTE PRESENTATION: **Quantitative Imaging as a Cancer Biomarker** (Conf. 9412) *(Mankoff)* 8:00 to 9:00 am, p. 11

KEYNOTE PRESENTATION: **The Open Microscopy Environment: Open Image Informatics for the Life and Biomedical Sciences** (Conf. 9413) *(Swedlow)* 10:10 to 11:10 am, p. 11

Women's Networking Lunch, 12:10 to 1:20 pm, p. 19

KEYNOTE PRESENTATION: **Twenty-five Years of Error** (Conf. 9415) *(Fitzpatrick)* 1:20 to 2:20 pm, p. 12

PANEL DISCUSSION: **CAD Grand Challenge-Present and Future** *(Hadjiiski, Tourassi)* 1:20 to 3:00 pm, p. 14

WS757 **Early Career Professional Development in Medical Imaging** *(Krupinski)* 1:30 pm to 5:30 pm, $125 / $175, p. 22

WORKSHOP 5: **Computing in Medical Imaging: The Future is in the Cloud** *(Mello-Thoms)* 5:00 to 7:00 pm, p. 15

WORKSHOP 2: **Imaging Genetics,** (Conference 9413) *(Lelieveldt)* 5:00 to 7:00 pm, p. 15

WORKSHOP 3: **Live Demonstrations,** *(Aylward, Chang)* 5:00 to 7:00 pm, p. 15

WORKSHOP 9: **Power of Pathology: Predicting Disease Aggresssiveness from Tissue Slides** *(Madabhushi, Gurcan)* 5:00 to 7:00 pm, p. 15

WEDNESDAY 25 February

9416 Image Perception, Observer Performance, and Technology Assessment *(Mello-Thoms, Kupinski)* p. 24

9420 Digital Pathology *(Gurcan, Madabhushi)* p. 25

KEYNOTE PRESENTATION: **I am a Breast Imager; You are a VIsual Scientist. Let's Dance and Make a Better Radiologist** (Conf. 9416) *(Georgian-Smith)* 8:00 to 9:00 am, p. 12

KEYNOTE PRESENTATION: **The Rapid Imaging Renaissance: Sparser Samples, Denser Dimensions, and Glimmerings of a Grand Unified Tomography** (Conf. 9417) *(Sodickson)* 10:10 to 11:10 am, p. 12

KEYNOTE PRESENTATION: **Twenty Years of Image-based Search Technology in Review: Bright Prospects for Image-based Search and Decision Support in Whole Slide Imaging** (Conf. 9420) *(Balis)* 1:20 to 2:20 pm, p. 13

Interactive Poster Session and Reception, 5:30 to 7:00 pm, p. 16

THURSDAY 26 February

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

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9412	Conference 9413	Conference 9414	Conference 9415	Conference 9416	Conference 9417	Conference 9418	Conference 9419	Conference 9420
SUNDAY · 22 February									
8:00 to 9:40 am	SESSION 1: **Physics of Contrast Enhancement**		SESSION 1: **Musculoskeletal and Miscellaneous**	SESSION 1: **Cardiac Procedures**			SESSION 1: **Keynote and Big Data**	SESSION 1: **Motion and Deformation Imaging, Novel Imaging Approaches**	
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	SESSION 2: **Image Reconstruction**		SESSION 2: **Lung and Chest I**	SESSION 2: **Endoscopy/ Laparoscopy**			SESSION 2: **Big Data in Medical Imaging and Informatics**	SESSION 2: **Keynote and Photoacoustics and Acoustic Microscopy**	
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm	SESSION 3: **Detector Technology**		SESSION 3: **Vessels, Heart and Eye I**	SESSION 3: **Cranial Procedures**			SESSION 3: **Advanced PACS-Based Radiology Workflow and Image Sharing**	SESSION 3: **Ultrasound Computer Tomography**	
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm	SESSION 4: **Phase Contrast Imaging**		SESSION 4: **Breast I**	SESSION 4: **Treatment Planning and Robotic Systems**			SESSION 4: **New Technologies and Concepts for PACS and Imaging Informatics**	SESSION 4: **Transducers, Beamforming, Systems**	
5:45 to 7:45 pm	**TECHNICAL WORKSHOPS**								
MONDAY · 23 February									
8:00 to 9:40 am	SESSION 5: **Algorithmic Developments**		SESSION 5: **Prostate and Colon I**	SESSION 5: **Registration**			SESSION 5: **Information Management, Systems Integration and Standards**	SESSION 5: **Ultrasound Computer Tomography II**	
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	SESSION 6: **Computed Tomography I**		SESSION 6: **Keynote and Novel Methods**	SESSION 6: **Ultrasound Image Guidance: Joint Session with Conference 9419**			SESSION 6: **Quantitative Analysis, Data Mining and Image-Based Patient-Specific Data Modeling**	SESSION 6: **Ultrasound Image Guidance:** Joint Session with Conference 9415	
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:40 pm	SESSION 7: **Photon Counting Imaging**		SESSION 7: **Head and Neck**	SESSION 7: **Tracking and Organ Motion Modeling**			SESSION 7: **Imaging Informatics for Diagnostic and Therapeutic Applications**	SESSION 7: **Ultrasound Image Analysis**	
3:30 to 4:00 pm	**Coffee Break**						POSTER AWARD ANNOUNCEMENTS	POSTER AWARD ANNOUNCEMENTS	
4:00 to 5:30 pm	**Best Student Paper Awards and Plenary Presentation**								
5:30 to 7:00 pm	**SUNDAY/MONDAY POSTER SESSION**								

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9412	Conference 9413	Conference 9414	Conference 9415	Conference 9416	Conference 9417	Conference 9418	Conference 9419	Conference 9420
TUESDAY · 24 February									
8:00 to 9:40 am	SESSION 8: **Keynote and Novel Imaging Technologies**	SESSION 1: **Quantitative Image Analysis**	SESSION 8: **Breast II**	SESSION 8: **Segmentation**					
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: **Measurements, Phantoms, Simulations**	SESSION 2: **Keynote and Diffusion MRI Analysis**	SESSION 9: **Prostate and Colon II**	SESSION 9: **Intraoperative Imaging and Visualization**					
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm	SESSION 10: **Breast Imaging**	SESSION 3: **Image Representation and Reconstruction**	SESSION 10: PANEL DISCUSSION: **CAD Grand Challenge-Present and Future**	SESSION 10: **Keynote and 2D/3D Registration**		SESSION 1: **Novel Imaging Techniques and Applications**			
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 4:50 pm	SESSION 11: **Radiation Dose and Dosimetry** *(Bruce*	SESSION 4: **Compressed Sensing/Sparse Methods**	SESSION 11: **Vessels, Heart, and Eye II**	SESSION 11: **Abdominal and Pelvic Procedures**		SESSION 2: **Innovations in Image Processing**			
5:00 to 7:00 pm	**TECHNICAL WORKSHOPS**								
WEDNESDAY · 25 February									
8:00 to 9:40 am	SESSION 12: **Performance Evaluation**	SESSION 5: **Machine Learning**	SESSION 12: **Lung and Chest II**		SESSION 1: **Keynote and Breast I**	SESSION 3: **Novel MR Techniques and Applications**			
9:40 to 10:10 am	**Coffee Break**								
10:10 am to 12:10 pm	SESSION 13: **X-Ray Imaging**	SESSION 6: **Shape and Models**	SESSION 13: **Multi-Organ**		SESSION 2: **Breast II**	SESSION 4: **Keynote and Neurological Imaging**			
12:10 to 1:20 pm	**Lunch Break**								

DAILY CONFERENCE SESSION SCHEDULE

TIME	Conference 9412	Conference 9413	Conference 9414	Conference 9415	Conference 9416	Conference 9417	Conference 9418	Conference 9419	Conference 9420
WEDNESDAY Afternoon · 25 February									
1:20 to 3:00 pm	SESSION 14: **Computed Tomography II**	SESSION 7: **Computational Anatomy**			SESSION 3: **Observer Performance Evaluation**	SESSION 5: **fMRI**			SESSION 1: **Keynote and Trends**
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm	SESSION 15: **Tomosynthesis**	SESSION 8: **Segmentation: Brain**			SESSION 4: **CT**	SESSION 6: **Optical**			SESSION 2: **Emerging Applications**
5:30 to 7:00 pm	**TUESDAY/WEDNESDAY POSTER SESSION**								
THURSDAY · 26 February									
8:00 to 9:40 am		SESSION 9: **Segmentation**			SESSION 5: **Model Observers I**	SESSION 7: **Fluids and Cardiovascular**			SESSION 3: **Gastro-Intestinal/ Genito-Urinary**
9:40 to 9:45 am		POSTER AWARD ANNOUNCEMENTS			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: **Classification**			SESSION 6: **Visual Search**	SESSION 8: **Cancer Imaging**			SESSION 4: **Breast**
12:10 to 1:20 pm	**Lunch Break**								
1:20 to 3:00 pm		SESSION 11: **Motion/Time Series**			SESSION 7: **Model Observers II**	SESSION 9: **Lung**			
3:00 to 3:30 pm	**Coffee Break**								
3:30 to 5:30 pm		SESSION 12: **Registration**			SESSION 8: **Technology Assessment**	SESSION 10: **Bone**			

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SPECIAL EVENTS.

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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LUNGx Grand Challenge Winner Accouncement

Plenary and Awards Session

Monday 23 February · 4:00 to 5:30 pm · Location: Crystal C

4:15 to 5:15 pm

4/5D Imaging for Guiding Intracardiac and Extracorporeal Ablation of Cardiac Arrhythmias

Douglas L. Packer, M.D.
Mayo Clinic (USA)

BIOGRAPHY: **Douglas L. Packer, M.D.,** is a consultant in the Division of Cardiovascular Diseases, Department of Internal Medicine, at Mayo Clinic Rochester. He is the Director of the Heart Rhythm Services and the Director of the Translational Electrophysiology Research Laboratory. Dr. Packer is recognized with the academic rank of the John M. Nasseff, Sr., Professor in Cardiovascular Diseases, and is internationally known in cardiac electrophysiology. He is also the John M. Nasseff, Sr., Professor of Cardiology at Mayo Clinic.

He received the MD degree at the University of Utah and completed an internship, residency and fellowship at Duke University, where he was on staff before coming to Mayo. His honors and awards include the Distinguished Service Award from Brigham Young University.

Dr. Packer is active in the Heart Rhythm Society where he is a past president and member of the Board of Trustees. He is also active in the American Heart Association and the American College of Cardiology. He has served on editorial boards for the American Heart Journal, the Journal of Cardiovascular Electrophysiology, Heart Rhythm journal, and the Journal of the American College of Cardiology. He also has served on National Heart, Lung, and Blood Institute work groups on atrial fibrillation.

Dr. Packer has been an active teacher and mentor, and also lectures widely on cardiac arrhythmias. He has written or co-authored more than 250 publications. He has lectured extensively in national and international meetings, giving over 1,000 invited lectures in 24 countries. He has served on the executive committee of a number of NIH multicenter randomized clinical trials, Including the MUSTT, SCD-HeFT, and HAT Trials. Dr. Packer is also the International Principal Investigator of the recently funded NIH CABANA Pivotal Study. In this capacity he leads the consortium of centers directing the trial.

Dr. Packer is a Mayo Clinician Investigator. His translational work focuses on the mechanisms and ablation of atrial fibrillation and other cardiac arrhythmias, autologous fibroblast modulation of electrical impulse propagation in the heart, and the development of carbon particle catheter-free ablation of arrhythmias. His clinical work investigates 4/5 dimensional integrated image-guided ablation, and the development of new energy sources for the modification of cardiac tissue. His work has been funded in part by private foundations, the American Heart Association, and the NIH. Dr. Packer holds US and European patents in the development of intracardiac ultrasound and 4/5D imaging.

AWARD FINALISTS

Join us on Monday at 4:00 pm in Crystal C 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 64 submissions.

PHYSICS OF MEDICAL IMAGING (9412)

Cone-beam CT of traumatic brain injury using statistical reconstruction with a post-artifact-correction noise model
Paper 9412-6
Student Author: **Hao Dang,** Johns Hopkins Univ. (USA)

A quantitative metrology for performance characterization of breast tomosynthesis systems based on an anthropomorphic phantom
Paper 9412-43
Student Author: **Lynda C. Ikejimba,** Advanced Imaging Labs., Duke Univ. (USA)

IMAGE PROCESSING (9413)

Relating speech production to tongue muscle compressions using tagged and high-resolution magnetic resonance imaging
Paper 9413-56
Student Author: **Fangxu Xing,** Johns Hopkins Univ. (USA)

COMPUTER-AIDED DIAGNOSIS (9414)

A superpixel-based framework for automatic tumor segmentation on breast DCE-MRI
Paper 9414-23
Student Author: **Ning Yu,** The Univ. of Pennsylvania Health System (USA)

Automatic discrimination of color retinal images using the bag of words approach
Paper 9414-54
Student Author: **Ibrahim Sadek,** Univ. de Bourgogne (France)

IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING (9415)

Known-component 3D-2D registration for image guidance and quality assurance in spine surgery pedicle screw placement
Paper 9415-50
Student Author: **Ali Uneri,** Johns Hopkins Univ. (USA)

Medical image segmentation using object atlas versus object cloud models
Paper 9415-56
Student Author: **Renzo Phellan,** Univ. Estadual de Campinas (Brazil)

IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT (9416)

Optimization of energy window and evaluation of scatter compensation methods in MPS using the ideal observer with model mismatch
Paper 9416-23
Student Author: **Michael Ghaly,** Johns Hopkins Univ. (USA)

BIOMEDICAL APPLICATIONS IN MOLECULAR, STRUCTURAL, AND FUNCTIONAL IMAGING (9417)

Automated pulmonary lobar ventilation measurements using volume-matched thoracic CT and MRI
Paper 9417-42
Student Author: **Fumin Guo,** Robarts Research Institute (Canada)

PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS (9418)

Medical case-based retrieval: integrating query MeSH terms for query-adaptive multi-modal fusion
Paper 9418-26
Student Author: **Alba García Seco de Herrera,** HES-SO Valais (Switzerland)

ULTRASONIC IMAGING AND SIGNAL PROCESSING (9419)

Implementation of synthetic aperture swept sensor imaging
Paper 9419-16
Student Author: **Nick Bottenus,** Duke Univ. (USA)

DIGITAL PATHOLOGY (9420)

Segmentation of digitized histological sections for vasculature quantification in the mouse hind limb
Paper 9420-2
Student Author: **Yiwen Xu,** The Univ. of Western Ontario (Canada)

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 2014 ROBERT F. WAGNER BEST STUDENT PAPER AWARD RECIPIENTS

1ST PLACE

Antonio Martínez-Torteya, Tecnológico de Monterrey (Mexico)

MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression [9035-78]

RUNNER-UP

Geert Litjens, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation [9036-49]

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PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS
CONFERENCE 9418 · Paper Number 9418-1

Practical Applications and Pitfalls of "Big Data" for Decision Support in Medical imaging and Informatics

Sunday 22 February 2015
8:00 to 9:00 am · Location: Crystal E

Eliot Siegel, M.D.,
Hospital of the Univ. of Pennsylvania (USA)

ABSTRACT: "BIG DATA" is currently one of the hottest topics in medicine from a research and clinical perspective. However, it's impossible to get any consensus on its definition. IBM and others have defined it in terms of the four V's, volume, velocity, variety, and, particularly relevant to healthcare, veracity

Whichever definition that we may use when thinking of "Big Data," medicine and in specific, diagnostic imaging clearly generates vast amounts of it. The volume and complexity of medical information in healthcare has doubled every five years with 80% or more of that data unstructured.

One of the major challenges with medical imaging is the difficulty of discovery of imaging information in the electronic medical record and from clinical trial data. Our imaging reports are, almost without exception, unstructured and our medical images are rarely tagged in such a way as to be discoverable or useful to data mining efforts. This must change if medical imaging is to play a substantial role in this era of big data, medical guidelines, decision support and personalized medicine.

The goals of this presentation include defining "Big Data" and issues such as archival of clinical images and other data and metadata, exploring the current role and applications of big data in diagnostic imaging with an emphasis on clinical applications and speculating about the potential and future applications of Big Data to help in visualization of images and data, and diagnosis and treatment. Practical applications for decision support and screening will be presented.

BIOGRAPHY: **Dr. Eliot Siegel** is Professor and Vice Chairman at the University of Maryland School of Medicine and of Computer Science and Biomedical Engineering at the University of Maryland.

ULTRASONIC IMAGING AND TOMOGRAPHY
CONFERENCE 9419 · Paper Number 9419-6

Synergistic Integration of Photoacoustic and Ultrasound Computed Tomography

Sunday 22 February 2015
10:10 to 10:50 am · Location: Oceans 2

Mark Anastasio, Ph.D.
Washington Univ. in St. Louis (USA)

ABSTRACT: Photoacoustic computed tomography (PACT) is an emerging soft-tissue imaging modality that has great potential for a wide range of biomedical imaging applications. It can be viewed as a hybrid imaging modality that combines an optical contrast mechanism with ultrasonic detection principles, thereby combining the advantages of optical and ultrasonic imaging while circumventing their primary limitations.

Conventional PACT image reconstruction methods assume that the object and surrounding medium are described by a constant speed-of-sound (SOS) value. In order to accurately recover fine structures, SOS heterogeneities should be quantified and compensated for during PACT reconstruction. To achieve this, several groups have proposed hybrid systems that combine PACT with ultrasound computed tomography (USCT). In such systems, a SOS map is reconstructed first via USCT and subsequently employed to inform the PACT reconstruction method. Additionally, the SOS map can provide structural information regarding tissue that complementary to the functional information provided by PACT.

In this talk, we review recent advancements in practical image reconstruction approaches for PACT. Such advancements include physics-based models of the measurement process and associated inversion methods for reconstructing images from limited data sets in acoustically heterogeneous media. We also propose a paradigm shift in the way that images are reconstructed in hybrid PACT-USCT imaging. Namely, we propose to jointly reconstruct the absorbed optical energy density and SOS distributions from a combined set of USCT and PACT measurements, thereby reducing the two reconstruction problems into one. Applications of PACT to transcranial brain imaging and breast cancer detection will also be addressed.

BIOGRAPHY: **Dr. Anastasio** earned his PhD degree at the University of Chicago in 2001 and was on the faculty at Illinois Institute of Technology from 2001-2010. He is currently a Professor of Biomedical Engineering at Washington University in St. Louis.

COMPUTER-AIDED DIAGNOSIS

CONFERENCE 9414 · Paper Number 9414-29

Role of Machine Learning in Clinical Decision Support

Monday 23 February 2015
10:10 to 11:10 am · Location: Crystal D

Tanveer Syeda-Mahmood, Ph.D.
Chief Scientist, Medical Sieve Radiology Grand Challenge, IBM Almaden Research Center (USA)

ABSTRACT: With the advent of new machine learning techniques, the field of automated clinical decision support is poised for a new growth. Previously, the decision support systems have been predominantly rule-based and built on fixed pre-determined associations from clinical knowledge. The IBM AALIM system pioneered a new direction in evidence-based medicine using the concept of patient similarity and exploiting consensus opinions of other physicians who have looked at similar patients. It proposed the fundamental idea that similar clinical data points to similar patients and therefore to similar recommendations for diagnosis, treatment and outcome. This led to a scalable learning-driven way of doing clinical decision support where associations between diseases and their manifestations in modality data were learned automatically through patient similarity methods. With the advent of deep learning methods, learning-based decision support can now be combined with clinical knowledge-driven techniques to define the next generation of clinical decision support systems.

In this talk, I will discuss the role of learning techniques in decision support giving examples from practical multimodal decision support systems. I will also describe the IBM Medical Sieve Radiology Grand Challenge, a worldwide collaborative research effort across IBM research labs that is expanding patient data and knowledge-driven learning methods to define new clinical decision support systems for radiologists.

BIOGRAPHY: **Dr. Tanveer Syeda-Mahmood** is a Senior Manager at IBM Research, Almaden and the Chief Scientist/overall lead for the research-wide Medical Sieve Radiology Grand Challenge project at IBM Research.

PHYSICS OF MEDICAL IMAGING

CONFERENCE 9412 · Paper Number 9412-40

Quantitative Imaging as a Cancer Biomarker

Tuesday 24 February 2015
8:00 to 9:00 am · Location: Crystal C

David Mankoff, M.D., Ph.D.
Hospital of the Univ. of Pennsylvania (USA)

ABSTRACT: The ability to assay tumor biologic features and the impact of drugs on tumor biology is fundamental to drug development. Advances in our ability to measure genomics, gene expression, protein expression, and cellular biology have led to a host of new targets for anticancer drug therapy. In translating new drugs into clinical trials and clinical practice, these same assays serve to identify patients most likely to benefit from specific anticancer treatments. As cancer therapy becomes more individualized and targeted, there is an increasing need to characterize tumors and identify therapeutic targets to select therapy most likely to be successful in treating the individual patient's cancer. Thus far assays to identify cancer therapeutic targets or anticancer drug pharmacodynamics have been based upon in vitro assay of tissue or blood samples. Advances in molecular imaging, particularly PET have led to the ability to perform quantitative non-invasive molecular assays. Imaging has traditionally relied on structural and anatomic features to detect cancer and determine its extent. More recently, imaging has expanded to include the ability to image regional biochemistry and molecular biology, often termed molecular imaging. Molecular imaging can be considered an in vivo assay technique, capable of measuring regional tumor biology without perturbing it. This makes molecular imaging a unique tool for cancer drug development, complementary to traditional assay methods, and a potentially powerful method for guiding targeted therapy in clinical trials and clinical practice. The ability to quantify, in absolute measures, regional in vivo biologic parameters strongly supports the use of molecular imaging as a tool to guide therapy.

This talk will review current and future applications of quantitative molecular imaging as a biomarker for cancer therapy, including the use of imaging to (1) identify patients whose tumors express a specific therapeutic target; (2) determine whether the drug reaches the target; (3) identify an early, pharmacodynamic response to treatment; (4) predict the impact of therapy on long-term outcomes such as survival. The talk will review basic concepts important in the application of molecular imaging to cancer drug therapy, in general, and will discuss specific examples of studies in humans, and highlight future directions, including ongoing multi-center clinical trials using molecular imaging as a cancer biomarker.

BIOGRAPHY: **Dr. David Mankoff** is Gerd Muehllehner Professor of Radiology, Chief of the Division of Nuclear Medicine Clinical Molecular Imaging, and Director of the PET Center at the Perelman School of Medicine at the University of Pennsylvania.

IMAGE PROCESSING

CONFERENCE 9413 · Paper Number 9413-6

The Open Microscopy Environment: Open Image Informatics for the Life and Biomedical Sciences

Tuesday 24 February 2015
10:10 to 11:10 am · Location: Crystal E

Jason R. Swedlow, Ph.D.
Ctr. For Gene Regulation and Expression, Univ. of Dundee, Scotland (United Kingdom) and the OME Consortium

ABSTRACT: DespiteDespite significant advances in biological imaging and analysis, major informatics challenges remain unsolved: file formats are proprietary, storage and analysis facilities are lacking, as are standards for sharing image data and results. The Open Microscopy Environment (OME) [1] is an open-source software framework developed to address these challenges. OME has three components—an open data model for biological imaging: OME data model; standardized file formats (OME-TIFF) and software libraries for file conversion (Bio-Formats [2]); and a software platform for image data management and analysis (OMERO [3]).

The Java-based OMERO client-server platform [3] comprises an image metadata store, an image repository, visualization and analysis by remote access, enabling sharing and publishing of image data. OMERO's model-based architecture has enabled its extension into a range of imaging domains, including light and electron microscopy, high content screening and recently into applications using non-image data from clinical and genomic studies [4].

Our current version, OMERO-5 improves support for large datasets and reads images directly from their original file format, allowing access by third party software. OMERO and Bio-Formats run the JCB DataViewer [5], the world's first on-line scientific image publishing system and several other institutional image data repositories (e.g. [6], [7]).

References
[1] http://openmicroscopy.org
[2] http://openmicroscopy.org/site/products/bio-formats
[3] http://openmicroscopy.org/site/products/omero
[4] http://www.openmicroscopy.org/site/products/partner
[5] http://jcb-dataviewer.rupress.org/
[6] http://odr.stowers.org
[7] http://emdatabank.org/

BIOGRAPHY: **Jason Swedlow** earned a BA in Chemistry from Brandeis University in 1982 and PhD in Biophysics from UCSF in 1994. After a postdoctoral fellowship with Dr T. J. Mitchison at UCSF and then Harvard Medical School, Dr Swedlow established his own laboratory in 1998 at the Wellcome Trust Biocentre, University of Dundee, as a Wellcome Trust Career Development Fellow.

IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING

CONFERENCE 9415 · Paper Number 9415-49

Twenty-five Years of Error

Tuesday 24 February 2015
1:20 to 2:20 pm · Location: Oceans 4

J. Michael Fitzpatrick, Ph.D.
Vanderbilt Univ. (USA)

ABSTRACT: Today, the phrase, "Target Registration Error", typically shortened to TRE, is an integral part of the vernacular of both surgical guidance and image registration, but it was not always so. This terminology, along with "Fiducial Registration Error" and "Fiducial Localization Error" was developed circa 1990 to facilitate the communication of information among researchers who were contending with the errors that arise when one view of a patient is aligned with another, particularly when that alignment is based on fiducial markers. The work required to develop a theoretical understanding of these errors and to develop algorithms and experimental methods to probe them has involved many people and many institutions, and it continues today. This twenty-five year effort is the subject of this address, but we will not dwell on the details, almost all of which have been presented first at this very same symposium. Instead we will focus on the backstory. It is a story of people and events, of lab rivalry and cooperation, of heroes and villains, of sour reviews and sweet vindication, of disappointment when things keep going wrong, and gratification when they finally go right. And it even includes a murder mystery. This address is meant to be entertaining, but it is hoped that it might also send an encouraging message to those researchers, particularly students, who are having troubles of their own. And that message is that setbacks and criticism today do not mean that success won't come tomorrow.

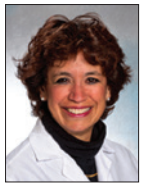
BIOGRAPHY: **J. Michael Fitzpatrick** is professor emeritus of computer science, electrical engineering, radiology, and neurosurgery at Vanderbilt University, where he has served since 1982. He is a fellow of the SPIE and of the IEEE, a co-editor of Volume Two of the Handbook of Medical Imaging, and was co-chair of the Image Processing Conference for four years.

IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT

CONFERENCE 9416 · Paper Number 9416-1

I am a Breast Imager; You are a Visual Scientist. Let's Dance and Make a Better Radiologist

Wednesday 25 February 2015
8:00 to 9:00 am · Location: Oceans 4



Dianne Georgian-Smith
Harvard Medical School and Brigham and Women's Hospital (USA)

BIOGRAPHY: Twenty-five years ago, **Dr Georgian-Smith** completed a fellowship in Breast Imaging, and was looking for a job as a general radiologist. Through an unforeseen series of events, she stayed on staff at University of Cincinnati (U.C.) and never left academia. She teamed with her U.C. colleague, Dr Bill Shiels D.O., who had invented the 'turkey breast model,' to learn and teach the hand-eye coordination of interventional ultrasound. This model carried her around the world. More importantly, her interest in education blossomed. Her next move was to University of Washington in Seattle in the mid-1990's. She began to ask, 'how do I see the finding 'architectural distortion' and why do others not see it? How can I teach what I see?.' It was not until a decade later when mammography became digital that these questions could be studied. The serendipitous meeting at the American Board of Radiology Oral Examination of the Irish perception investigators, Drs Brennan, McEntee, and Ryan, set up the team for collaboration. This work was supported by an RSNA Educational seed grant and was presented at RSNA in Chicago in 2011. What's next? She is determined to see the integration of the basic science of visual perception with the integration of clinical Radiology curriculum. The time has come for our fields to work in concert to make a better radiologist.

BIOMEDICAL APPLICATIONS IN MOLECULAR, STRUCTURAL, AND FUNCTIONAL IMAGING

CONFERENCE 9417 · Paper Number 9417-15

The Rapid Imaging Renaissance: Sparser Samples, Denser Dimensions, and Glimmerings of a Grand Unified Tomography

Wednesday 25 February 2015
10:10 to 11:10 am · Location: Oceans 2

Daniel Sodickson, M.D., Ph.D.
New York Univ. Medical School (USA)

ABSTRACT: The need to resolve both structure and dynamics is a connecting theme across diverse areas of endeavor spanning multiple orders of magnitude in space and time. The task of imaging is to gather spatiotemporal information which can be organized into a coherent map. Tomographic imaging in particular involves the use of multiple projections, or other interactions of a probe (light, sound, etc) with a body, in order to determine cross-sectional information. Though the probes and the corresponding imaging modalities may vary, and though the methodology of particular imaging approaches is in constant ferment, the conceptual underpinnings of tomographic imaging have in many ways remained fixed for many decades. Recent advances in applied mathematics, however, have begun to roil this intellectual landscape. The advent of compressed sensing, anticipated in various algorithms dating back many years but unleashed in full theoretical force in the last decade, has changed the way imagers have begun to think about data acquisition and image reconstruction. The power of incoherent sampling and sparsity-enforcing reconstruction has been demonstrated in various contexts and, when combined with other modern fast imaging techniques, has enabled unprecedented accelerations of image acquisition. Perhaps more importantly, however, such approaches have spurred a shift in perspective, prompting us to focus less on nominal data sufficiency than on information content. Beginning with examples from MRI, then proceeding through selected other modalities such as CT and PET, as well as multimodality combinations, this talk will explore the potential of newly evolving acquisition and reconstruction paradigms to change the way we do imaging in the lab and in the clinic.

BIOGRAPHY: **Daniel K. Sodickson,** MD, PhD, is Vice-Chair for Research in the Department of Radiology and Professor of Radiology, Physiology & Neuroscience at New York University School of Medicine.

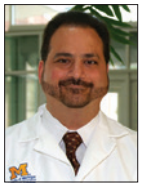
See full Keynote presentor biographies online

DIGITAL PATHOLOGY

CONFERENCE 9420 · Paper Number 9420-1

Twenty Years of Image-based Search Technology in Review: Bright Prospects for Image-based Search and Decision Support in Whole Slide Imaging

Wednesday 25 February 2015
1:20 to 2:20 pm · Location: Crystal D



Ulysses G. J. Balis, M.D.
Univ. of Michigan Health Systems (USA)

ABSTRACT: Whole slide Imaging, as a collection of technologies in varying stages of adoption, will likely reach a critical mass of implementation, when one or more compelling clinical use cases can be realized. Of the numerous envisioned functions served by whole slide imaging, use of spatial information to algorithmically generate diagnostic, prognostic and theranostic information ranks highly, meriting vigorous exploration. A major component of enabling such algorithms is the attainment of robust underlying pattern matching technology, such that for any predicate test image, a candidate cohort of diagnostically correlated images can be identified from a pre-coordinated library of cases. Additionally, in the setting where such digital image libraries are augmented with diagnosis, treatment and outcomes metadata, it becomes possible to generate powerful and predictive decision support tools, which effectively convert a constellation of image-based features to a multivariate, high-dimensional predicate calculus assertion, ultimately imputing one or more diagnostically actionable terms from a controlled vocabulary. This historical review session will explore the current level of capability of the general class of so-called content-based image retrieval, as well as what can be expected in the near term, as a result of continued advances in feature detection / pattern recognition technology. An initial didactic session will be followed by interactive demonstrations, with an emphasis on oncology use-cases.

BIOGRAPHY: **Dr. Balis** currently serves as the director of the Division of Pathology Informatics, within the University of Michigan Health System.

RESULTS ANNOUNCED FOR THE LUNGx GRAND CHALLENGE.

Join your peers and colleagues at the interactive poster sessions and enjoy group discussions around focused technical topics.

OPEN TO ALL REGISTERED MEDICAL IMAGING CONFERENCE ATTENDEES.

SPIE-AAPM-NCI Lung Nodule Classification Challenge

As part of Medical Imaging 2015 in February, SPIE, the American Association of Physicists in Medicine (AAPM), and the National Cancer Institute (NCI) will conduct a "Grand Challenge" on developing quantitative image analysis methods for the diagnostic classification of malignant and benign lung nodules. This LUNGx Challenge will provide an important first step in addressing the long-term effort to evaluate clinical decision tools.

Members of the medical imaging research community, many of whom will attend the Computer-Aided Diagnosis (CAD) conference at Medical Imaging 2015, have been asked to develop, refine, and disseminate advanced quantitative image-analysis systems for diagnosing malignant lung nodules on computed tomography (CT) scans to improve the quality of computer-aided diagnosis in the task of lung nodule classification.

Challenge participants are invited to display poster presentations during the conference, and may demonstrate their algorithms during a live demonstration workshop on Tuesday. A special panel discussion on Tuesday afternoon will focus on the topic.

The participation of multiple research groups in the development of image analysis methods, some of which will be presented at SPIE Medical Imaging, is expected to yield advances in computer-aided diagnosis and, ultimately, to precision medicine.

The LUNGx Challenge is one of the many highlights in store at this symposium.

Presenters have been encouraged to submit their work for the proceedings volume as well as for the new SPIE *Journal of Medical Imaging*.

Organizers and Major Contributors:

Samuel G. Armato, University of Chicago (s-armato@uchicago.edu)

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TECHNICAL WORKSHOPS

These technical workshops are included with your registration.

SUNDAY WORKSHOPS · 5:45 to 7:45 pm

Uncertainties in the Medical Imaging Chain

WK1 JOINT TECHNICAL WORKSHOP: PHYSICS OF MEDICAL IMAGING (9412) AND IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT (9416)

5:45 to 7:45 pm · Location: Crystal C

WORKSHOP CHAIRS:

Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany), Otto-von-Guericke Univ. Magdeburg (Germany)

Despina Kontos, The Univ. of Pennsylvania Health System (USA)

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

PANELISTS:

Harrison H. Barrett, College of Optical Sciences, The Univ. of Arizona (USA)

Brandon D. Gallas, U.S. Food and Drug Administration (USA)

Weibo Li, Helmholtz Zentrum München GmbH (Germany)

Ehsan Samei, Duke Univ. School of Medicine (USA)

Ioannis Sechopoulos, Emory Univ. (USA)

The workshop is based on the experience of many years of research and presented work, that sometimes „measured differences" between systems or methods do not result in major changes in diagnostic performance or even therapeutic outcome. One of the reasons for this is to our point of view the uncertainties in the various steps of (characterizing) medical imaging. Therefore this workshop will after a short introduction focus first of all on the concept of uncertainties in measurements in general, then this concept will be applied to the characterization of imaging systems, physically and then in observer studies with a focus on human observer studies. There is an obvious link to the variability of patient parameters, which will be highlighted before a general outlook on the predictability of treatment decision and outcome based on the uncertainty in diagnosis based on medical imaging. We want to discuss with the participants the general concept, what this means for studies in the field of medical imaging to be performed and optimization strategies.

Quantifying and reducing uncertainties in cancer therapy, Harrison H. Barrett, David S. Alberts, James M. Woolfenden, Zhonglin Liu, Lars R. Furenlid, The Univ. of Arizona (USA) . . . . . .[9412-214]

Novel Robots for Less Invasive Surgery

WK4 TECHNICAL WORKSHOP: IMAGE-GUIDED PROCEDURES, ROBOTIC INTERVENTIONS, AND MODELING (9415)

5:45 to 7:45 pm · Location: Oceans 4

WORKSHOP CHAIR:
Robert J. Webster III, Vanderbilt Univ. (USA)

PANELISTS/SPEAKERS:

Jaydev P. Desai, Univ. of Maryland, College Park (USA)

Sung-Chul Kang, Korea Institute of Science and Technology (Korea, Republic of)

Pietro Valdastri, Vanderbilt Univ. (USA)

Gregory S. Fischer, Worcester Polytechnic Institute (USA)

The future of robotics in surgery is likely to be a move away from a single platform like the da Vinci toward increasing diversity in designs, applications, and capabilities. From the gastrointestinal tract to the brain, from magnetic control to non-magnetic design, from needles to manipulators, this workshop is designed to illustrate breadth of surgical robotic devices and applications, with a focus on the ways robots are poised to assist surgeons in the future. In particular, presentations will focus on robotic assistance for spinal disc procedures, interventions in the brain using MRI feedback, and less painful approaches to gastrointestinal endoscopy. The workshop brings together a panel of outstanding surgical robotics researchers who will describe some of their own current projects and provide perspectives on a variety of future applications for robots in surgery.

Radiology for the Non-Radiologist

5:45 to 7:45 pm · Location: Crystal E

WK7 TECHNICAL WORKSHOP: PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS (9418)

MODERATOR:

Jianguo Zhang, Shanghai Institute of Technical Physics (China)

PANELISTS/SPEAKERS:

Steven Horii, The Univ. of Pennsylvania Health System (USA)

Tessa S. Cook, The Univ. of Pennsylvania Health System (USA)

Po-Hao (Howard) Chen, The Univ. of Pennsylvania Health System (USA)

During the first part of the session, Dr. Horii and Dr. Cook will discuss the typical challenges faced by radiologists in terms of workflow, interfacing with other providers, communicating with patients and conducting research. Then, Dr. Chen will provide some perspective on what future workflow may involve. The second half will open the session to questions from the audience about research innovations that may help to address some of these challenges.

TUESDAY PANEL DISCUSSION · 1:20 TO 3:00 pm

PANEL DISCUSSION:

CAD Grand Challenge-Present and Future

1:20 to 3:00 pm · Location: Crystal D

MODERATORS:

Lubomir M. Hadjiiski, Univ. of Michigan Health System (USA)

Georgia D. Tourassi, Oak Ridge National Lab. (USA)

PANELISTS:

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

Karen Drukker, The Univ. of Chicago Medical Ctr. (USA)

Laurence P. Clarke, National Cancer Institute (USA)

George Redmond, National Cancer Institute (USA)

Stephen Aylward, Kitware, Inc. (USA)

Nicholas A. Petrick, U.S. Food and Drug Administration (USA)

Grand challenges provide a unique opportunity for bringing together scientists from academia, industry, and the government with the objective to evaluate and compare different algorithms in a structured, direct way.

This panel will provide a forum for discussion of the current experience with CAD grand challenges and the future potential of these avenues for evaluation and testing of decision support systems. The panel includes experts from academia, National Cancer Institute (NCI), Food and Drug Administration (FDA) and industry. The panel members and the audience will discuss current and future opportunities for CAD grand challenges to become important testbeds and to enable cross platforms for decision support system evaluation. By efficient planning and coordination among key organizing institutions, CAD grand challenges can play a vital role in the selection of promising classes of algorithms and systems for further clinical translational efforts, prompting advances in computer-aided diagnosis and ultimately precision medicine.

TECHNICAL WORKSHOPS

These technical workshops are included with your registration.

TUESDAY WORKSHOPS · 5:00 to 7:00 pm

Computing in Medical Imaging: The Future is in the Cloud

WK5 JOINT TECHNICAL WORKSHOP: IMAGE PERCEPTION, OBSERVER PERFORMANCE, AND TECHNOLOGY ASSESSMENT (9416) AND PACS AND IMAGING INFORMATICS: NEXT GENERATION AND INNOVATIONS (9418)

5:00 to 7:00 pm · Location: Oceans 4

WORKSHOP CHAIR:

Claudia R. Mello-Thoms, The Univ. of Sydney (Australia), Univ. of Pittsburgh (USA)

SPEAKERS/PANELISTS:

Medical Imaging in the Cloud: SWOT Analysis
James F. Philbin, Co-Director, Center for Biomedical and Imaging Informatics, Johns Hopkins Univ. (USA)

Cloud, Big Data, and Imaging Informatics
H. K. Bernie Huang, The Univ. of Southern California (USA)

Opportunities and Challenges of Big Data of Medical Image in Cloud Computing
Jianguo Zhang, Shanghai Institute of Technical Physics (China)

What Can the Cloud Do for Me?
Willliam J. Ryder, Brain and Mind Research Institute, The Univ. of Sydney (Australia)

Scientific Computing at Scale on Amazon Web Services
Angel Pizarro, Scientific and Research Computing, Amazon Web Services (USA)

Each speaker will present a short talk related to various aspects of cloud computing in medical imaging including its pros and cons, use in e-learning applications, deployment of medical imaging applications on a global basis, and the services provided by the AWS including educational grants. The talks will be followed by an open discussion.

Imaging Genetics

WK2 TECHNICAL WORKSHOP: IMAGE PROCESSING (9413)

5:00 to 7:00 pm · Location: Crystal E

WORKSHOP CHAIR:

Boudewijn P. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands)

SPEAKERS:

Vince D. Calhoun, The Mind Research Network (USA)

David R. Haynor, Univ. of Washington (USA)

The field of Imaging Genetics involves linking observations about the human genome to observations in imaging data. Especially novel genome-wide sequencing can now be combined with features in imaging studies, opening up unprecedented possibilities for discovering the cause of a disease, and relating it to its anatomical and functional consequences. The major challenge is how to exploit the synergism of imaging, genetic and other relevant biomedical data, all of which are very high dimensional. In this workshop, we start with an introduction in the field of radiogenomics by David Haynor. Then, Vince Calhoun will address blind source separation techniques to combine multi-modal brain data and genetic data. Finally, Boudewijn Lelieveldt will discuss the potential applications of the Allen Brain atlases to link imaging observations to gene expression and connectivity data. The workshop is concluded with a panel discussion.

Live Demonstrations

WK3 TECHNICAL WORKSHOP: COMPUTER-AIDED DIAGNOSIS (9414)

5:00 to 7:00 pm · Location: Oceans Ballroom

WORKSHOP CHAIRS:

Stephen R. Aylward, Ktiware Inc. (USA)

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

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 invites participation from all of the conferences that comprise the SPIE Medical Imaging Conference. We encourage the CAD, PACS, Perception, Physics, Image-Guided Procedures, 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 complementary to their oral and poster presentations.

The workshop will start with a short overview of the participating teams and systems. Next, the audience can interact with the teams during live demonstrations of the systems.

Power of Pathology: Predicting Disease Aggressiveness from Tissue Slides

WK9 TECHNICAL WORKSHOP: DIGITAL PATHOLOGY (9420)

5:00 to 7:00 pm · Location: Crystal C

WORKSHOP CHAIRS:

Anant Madabhushi, Case Western Reserve Univ. (USA)

Metin N. Gurcan, The Ohio State Univ. Wexner Medical Ctr. (USA)

PRESENTERS:

John Tomaszewski, Univ. at Buffalo (USA)

Michael Feldman, The Univ. of Pennsylvania Health System (USA)

Hannah L. Gilmore, Case Western Reserve Univ. School of Medicine (USA)

Ulysses J. Balis, Univ. of Michigan Health System (USA)

This workshop will build on last year's heavily subscribed workshop at the digital pathology meeting at SPIE 2014 in which 4 pathologists did a show-and-tell of different diseases with digitized pathology images for the engineering/computing audience. This year's workshop will have 4 top pathologists review different types of breast cancers and predict the corresponding risk score for these patients, the risk score having been obtained by a molecular (gene expression based) companion diagnostic test. The pathologists will review the slides with the audience and provide an interpretation of the more aggressive disease hall marks that they observe for the SPIE audience. The workshop will provide to the SPIE audience an idea of the types of features that are critical for identifying patterns of more aggressive versus indolent disease on tissue slides.

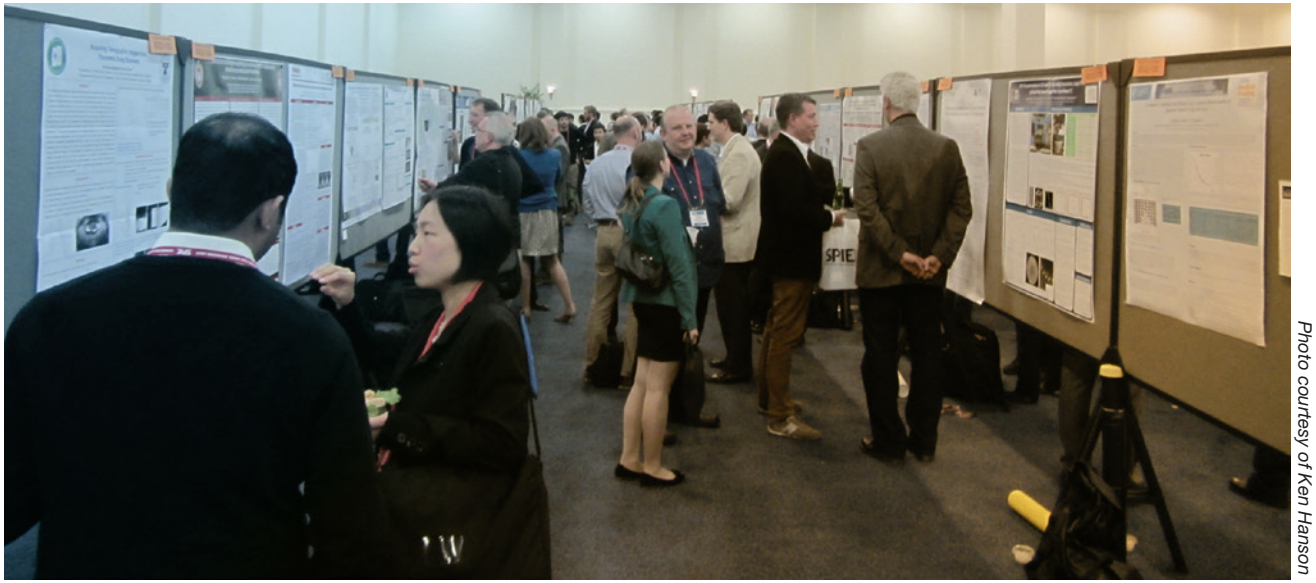

Photo courtesy of Ken Hanson

Poster Session Information

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 9:40 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.

2015 Poster Awards Information

Poster Awards in Conference Rooms

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

2015 Conference Awards

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

Physics of Medical Imaging Student Paper Award

(CONFERENCE 9412)

Tuesday 24 February 2015

9:40 to 9:45 am · Location: Crystal C

This award is specific to papers in the Physics of Medical Imaging conference 9412.

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

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Physics of Medical Imaging Poster Presentation Awards

(CONFERENCE 9412)

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The Physics of Medical Imaging conference will offer cash prizes as part of the poster presentation awards. Posters 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 noon on Sunday. Award announcements will take place in the conference room before coffee break on Tuesday.

Image-Guided Procedures Young Scientist Award

(CONFERENCE 9415)

Tuesday 24 February 2015

9:40 to 9:45 am · Location: Oceans 4

This award is specific to papers in the Image-Guided Procedures, Robotic Interventions, and Modeling conference 9415.

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

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Image-Guided Procedures Poster Presentation Awards

(CONFERENCE 9415)

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 noon on Sunday. Award Announcements will take place in the conference room before morning coffee break on Tuesday.

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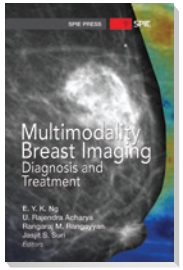

Multimodality Breast Imaging: Diagnosis and Treatment

Editors: E. Y. K. Ng, Jasjit S. Suri, Rangaraj M. Rangayyan, U. Rajendra Acharya

Vol. PM227
Print: SPIE Member $114 / Non-member $134
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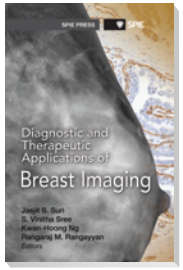

Diagnostic and Therapeutic Applications of Breast Imaging

Editors: Jasjit S. Suri, Kwan-Hoong Ng, Rangaraj M. Rangayyan, S. Vinitha Sree

Vol. PM211
Print: SPIE Member $114 / Non-member $134
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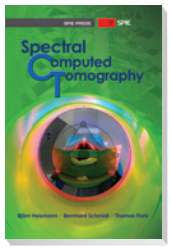
Computer-Aided Cancer Detection and Diagnosis: Recent Advances

Editors: Jinshan Tang, Sos S. Agaian

Vol. PM240
Print: SPIE Member $63 / Non-member $74
eBook: SPIE Member $54 / Non-member $63



Spectral Computed Tomography

Bernhard T. Schmidt, Björn J. Heismann, Thomas G. Flohr

Vol. PM226
Print: SPIE Member $48 / Non-member $57
eBook: SPIE Member $41 / Non-member $48

Translational Research in Biophotonics: Four National Cancer Institute Case Studies

Editor: Robert J. Nordstrom

Vol. PM246
Print: SPIE Member $63 / Non-member $74

SPIE.

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May require ticket and/or sign-up.

Lunch with the Experts - A Student Networking Event

Sunday 22 February 2015
12:10 to 1:20 pm · Location: Discovery Ballroom
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 24 February 2015
12:10 to 1:20 pm · Location: Atlantis Room
Lunch ticket required.

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

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

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

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Quantitative Characterization of Cancer Using in vivo Imaging

SC938 · Course Level: Introductory · CEU: 0.35
$360 Members · $410 Non-Members USD
Saturday 8:30 am to 12:30 pm

Instructor: **Thomas Yankeelov**

The course begins with a brief unit on the basic biological characteristics of cancer and then proceeds to study how each of the major *in vivo* imaging modalities is used to interrogate the tumor micro- and macroenvironment. The imaging techniques covered include: magnetic resonance imaging (MRI), optical imaging, computed tomography (CT), single photon emission computed tomography (SPECT), positron emission tomography (PET), and ultrasound imaging.

ImageJ Part 1: The GUI and Macro Programming with Applications to Image Processing and Image Analysis

SC1094 · Course Level: Introductory · CEU: 0.35
$360 Members · $410 Non-Members USD
Saturday 8:30 am to 12:30 pm

Instructor: **Richard VanMetter**

This course is an introduction to ImageJ, an open-source freely-available Java-based image image processing and analysis application. The course will focus on two key features of ImageJ: the graphical-user interface and the macro programming language. Together these provide a very-wide range of capabilities from simple image viewing to image processing and analysis of entire directories of images. The course will include real-time demonstrations of image processing and image analysis for several medical-imaging modalities. Anyone seeking an easy-to-use, extensible environment for image viewing, manipulation, processing and analysis who is considering ImageJ will benefit from this course.

This course is designed to pair with SC1095 ImageJ Part 2: Plugin Programming with Applications to Image Processing and Image Analysis. Attendees will benefit maximally from attending both sessions.

ImageJ Part 2: Plugin Programming with Applications to Image Processing and Image Analysis

SC1095 ·Course Level: Intermediate · CEU: 0.35
$360 Members · $410 Non-Members USD
Saturday 1:30 pm to 5:30 pm

Instructor: **Richard VanMetter**

This course is an introduction to Java object-oriented programming with application to ImageJ plugin programming. Plugins extend the capabilities of ImageJ, an open-source freely-available Java-based image processing and analysis application. They enable rapid prototyping of image processing and analysis concepts within the ImageJ wrapper, which does all of the file handling and image display, saving substantial time and effort. These can be readily shared with colleagues and clients. The course will focus on designing, programming and installing plugins for image processing and analysis applications. Real-time demonstrations will illustrate key concepts through examples from several medical-imaging modalities. Anyone seeking to extend their use of ImageJ beyond the user interface, available macros and macro-programming will benefit from this course. (Note: Course is based on the ImageJ 1.46 API)

This course is designed to pair with SC1094 ImageJ Part 1: The GUI and Macro Programming with Applications to Image Processing and Image Analysis. Attendees will benefit maximally from attending both sessions.

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** (né Lehmann), PhD,

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.

REGISTRATION REQUIRED.
SEE SPIE CASHIER TO REGISTER.

Graph Algorithmic Techniques for Biomedical Image Segmentation

SC1026 · Course Level: Intermediate · CEU: 0.35
$360 Members · $410 Non-Members USD
Monday 1:30 pm to 5:30 pm

Instructors: **Mona Garvin,** Ph.D. and **Xiaodong Wu,** Ph.D.

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.

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.

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.

REGISTRATION REQUIRED.
SEE SPIE CASHIER TO REGISTER.

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 **Hans Bornefalk**

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.

X-Ray Detector Performance and DQE: Principles and Measurements using a Linear-Systems Approach

SC358 · Course Level: Advanced · CEU: 0.35
$360 Members · $410 Non-Members USD
Sunday 1:30 pm to 5:30 pm

Instructor: **Ian Cunningham**

Medical x-ray imaging systems must be designed to ensure that maximum image quality is obtained for a specified radiation dose to the patient, and quality assurance programs are used to ensure these standards are maintained. This course is designed for anyone who wants to extend their understanding of how image quality is related to detector design and what that implies: how to talk about it, how to think about it, how to measure it and how to compare it. Performance metrics including the MTF, NPS, NEQ and DQE in digital radiography and mammography will be discussed. A cascaded-systems analysis will be used to help interpret the DQE of some real systems. The DQE of photon-counting systems, and the impact of detector limitations, will be discussed. Both non-mathematical intuitive descriptions and more rigorous mathematical descriptions will be presented.

Principles and Advancements in X-ray Computed Tomography

AVAILABLE IN ONLINE FORMAT

SC471 · Course Level: Introductory · CEU: 0.35
$450 Members · $500 Non-Members USD
Saturday 1:30 pm to 5:30 pm

Instructor: **Jiang Hsieh**

This course will present a description of the fundamental physics and mathematical principles of CT. Key system performance parameters and design tradeoffs are reviewed. Causes and corrections of various image artifacts are extensively discussed. Potential impact of image artifacts and performance parameters on other computer-based algorithms, such as CAD and 3D volume rendering, is outlined. The second part of the tutorial will focus on the recent technology advancements in CT. Basic principles, benefits, and inherent issues associated with the helical (spiral) CT, multi-slice CT, and volumetric CT will be described. Different reconstruction approaches to combat artifacts associated with cone beam and helical interpolation are examined. The tutorial will conclude with a discussion on the recent advancements in CT applications, such as cardiac imaging, perfusion, dual energy, and fluoroscopy.

COURSE PRICE INCLUDES the text *Computed Tomography: Principles, Design, Artifacts, and Recent Advances, 2nd edition* (SPIE Press, 2009) by Jiang Hsieh.

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.

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TECHNICAL CONFERENCES

CONFERENCE 9412

Room: Crystal C

Sunday–Wednesday 22–25 Feb. 2015
Proceedings of SPIE Vol. 9412

Physics of Medical Imaging

Conference Chairs: **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany), Otto-von-Guericke Univ. Magdeburg {Germany); **Despina Kontos,** The Univ. of Pennsylvania Health System (USA)

Conference Co-Chair: **Thomas G. Flohr,** Siemens AG (Germany)

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,** Stanford Univ. School of Medicine (USA); **Taly Gilat-Schmidt,** Marquette Univ. (USA); **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA); **Michael Grass,** Philips Research (Germany); **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Karim S. Karim,** Univ. of Waterloo (Canada); **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA); **Robert M. Nishikawa,** Univ. of Pittsburgh (USA); **Jinyi Qi,** Univ. of California, Davis (USA); **Magdalena Rafecas,** Instituto de Física Corpuscular (Spain); **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada); **John M. Sabol,** GE Healthcare (USA); **Anders Tingberg,** Lund Univ. (Sweden); **Bruce R. Whiting,** Univ. of Pittsburgh (USA); **John Yorkston,** Carestream Health, Inc. (USA); **Wei Zhao,** Stony Brook Medicine (USA)

Posters for this conference will be on display Sunday and Monday in Oceans Ballroom. 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. Check conference program for exact time.

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CONFERENCE 9413

Room: Crystal E

Tuesday–Thursday 24–26 Feb. 2015
Proceedings of SPIE Vol. 9413

Image Processing

Conference Chairs: **Sébastien Ourselin,** Univ. College London (UK); **Martin A. Styner,** The Univ. of North Carolina at Chapel Hill (USA)

Program Committee: **Rafeef Abugharbieh,** The Univ. of British Columbia (Canada); **Paul Aljabar,** King's College London (UK); **Mostafa Analoui,** The Livingston Group LLC (USA); **Elsa D. Angelini,** Télécom ParisTech (France); **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); **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); **Benjamin Glocker,** Imperial College London (UK); **Guido Gerig,** The Univ. of Utah (USA); **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,** Univ. of Pittsburgh Medical Ctr. (USA); **Boudewijn P. F. Lelieveldt,** Leiden Univ. Medical Ctr. (Netherlands); **Murray H. Loew,** The George Washington Univ. (USA); **Cristian Lorenz,** Philips Research (Germany); **Frederik Maes,** Katholieke Univ. Leuven (Belgium); **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); **Mads Nielsen,** Niels Bohr Institute (Denmark); **Wiro J. Niessen,** Erasmus MC (Netherlands); **Brian Nutter,** Texas Tech Univ. (USA); **Dzung L. Pham,** Henry Jackson Foundation/USU (USA), National Institutes of Health {USA), Johns Hopkins Univ. {USA); **Josien P. W. Pluim,** Technische Univ. Eindhoven (Netherlands); **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); **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); **Andreas Wahle,** The Univ. of Iowa (USA); **Wolfgang Wein,** ImFusion GmbH (Germany)

Posters for this conference will be on display Tuesday and Wednesday in Oceans Ballroom. 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 9414

Room: Crystal D

Sunday–Wednesday 22–25 Feb. 2015
Proceedings of SPIE Vol. 9414

Computer-Aided Diagnosis

Conference Chairs: **Lubomir M. Hadjiiski,** Univ. of Michigan Health System (USA); **Georgia D. Tourassi,** Oak Ridge National Lab. (USA)

Program Committee: **Samuel G. Armato III,** The Univ. of Chicago (USA); **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); **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); **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); **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA); **Marius George Linguraru,** Children's National Medical Ctr. (USA); **Kensaku Mori,** Nagoya Univ. (Japan); **Janne J. Näppi,** Massachusetts General Hospital (USA); **Meindert Niemeijer,** IDx, LLC (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 Oceans Ballroom. 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. Check conference program for exact time.

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CONFERENCE 9415

Room: Oceans 4

Sunday–Tuesday 22–24 Feb. 2015
Proceedings of SPIE Vol. 9415

Image-Guided Procedures, Robotic Interventions, and Modeling

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

Program Committee: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Wolfgang Birkfellner,** Medizinische Univ. Wien (Austria); **Alexandre X. Falcão,** Univ. Estadual de Campinas (Brazil); **Baowei Fei,** Emory Univ. (USA); **Gabor Fichtinger,** Queen's Univ. (Canada); **George J. Grevera,** Saint Joseph's Univ. (USA); **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); **Guy Shechter,** Philips Healthcare (USA); **Eric J. Seibel,** Univ. of Washington (USA); **Andrew D. Wiles,** Northern Digital Inc. (Canada); **Ivo Wolf,** Hochschule Mannheim (Germany); **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ. (USA)

Posters for this conference will be on display Sunday and Monday in Oceans Ballroom. 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. Check conference program for exact time.

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CONFERENCE 9416

Room: Oceans 4

Wednesday–Thursday 25–26 Feb. 2015
Proceedings of SPIE Vol. 9416

Image Perception, Observer Performance, and Technology Assessment

Conference Chairs: **Claudia R. Mello-Thoms,** The Univ. of Sydney (Australia), Univ. of Pittsburgh {USA); **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (USA)

Program Committee: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA); **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); **Subok Park,** U.S. Food and Drug Administration (USA); **David L. Wilson,** Case Western Reserve Univ. (USA); **Federica Zanca,** Katholieke Univ. Leuven (Belgium)

Posters for this conference will be on display Tuesday and Wednesday in Oceans Ballroom. 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 9417

Room: Oceans 2

Tuesday–Thursday 24–26 Feb. 2015Proceedings of SPIE Vol. 9417

Biomedical Applications in Molecular, Structural, and Functional Imaging

Conference Chairs: **Barjor Gimi,** Geisel School of Medicine at Dartmouth (USA); **Robert C. Molthen,** GE Healthcare (USA), Marquette Univ. {USA), Medical College of Wisconsin {USA)

Program Committee: **Amir A. Amini,** Univ. of Louisville (USA); **Thorsten M. Buzug,** Univ. zu Lübeck (Germany); **Juan R. Cebral,** George Mason Univ. (USA); **Yu Chen,** Univ. of Maryland, College Park (USA); **Anne V. Clough,** Marquette Univ. (USA); **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Andreas H. Hielscher,** Columbia Univ. (USA); **Xiaoping P. Hu,** Emory Univ. (USA); **Xavier Intes,** Rensselaer Polytechnic Institute (USA); **Vikram Kodibagkar,** Arizona State Univ. (USA); **Andrzej Krol,** SUNY Upstate Medical Univ. (USA); **John F. LaDisa,** Marquette Univ. (USA); **Armando Manduca,** Mayo Clinic College of Medicine (USA); **Merryn Tawhai,** The Univ. of Auckland (New Zealand); **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 Oceans Ballroom. 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 9418

Room: Crystal E

Sunday–Monday 22–23 Feb. 2015 Proceedings of SPIE Vol. 9418

PACS and Imaging Informatics: Next Generation and Innovations

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

Program Committee: **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 Oceans Ballroom. 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. Check conference program for exact time.

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CONFERENCE 9419

Room: Oceans 2

Sunday–Monday 22–23 Feb. 2015 Proceedings of SPIE Vol. 9419

Ultrasonic Imaging and Tomography

Conference Chairs: **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands); **Neb Duric,** Delphinus Medical Technologies (USA), Barabara Ann Karmanos Cancer Institute {USA)

Program Committee: **Jeffrey C. Bamber,** The Royal Marsden NHS Foundation Trust (UK); **Jan D'Hooge,** Katholieke Univ. 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); **Brecht Heyde,** Katholieke Univ. Leuven (Belgium); **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); **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,** General Electric Co. (USA); **William F. Walker,** Univ. of Virginia (USA)

Posters for this conference will be on display Sunday and Monday in Oceans Ballroom. 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. Check conference program for exact time.

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CONFERENCE 9420

Room: Crystal D

Wednesday–Thursday 25–26 Feb. 2015 Proceedings of SPIE Vol. 9420

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); **Andrew Beck,** Beth Israel Deaconess Medical Ctr. (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); **Andinet Enquobahrie,** Kitware, Inc. (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); **Stephen M. Hewitt,** National Cancer Institute (USA); **Jason Hipp,** National Cancer Institute (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,** VuCOMP, Inc. (USA); **Nasir M. Rajpoot,** Qatar Univ. (Qatar); **Badrinath Roysam,** Univ. of Houston (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); **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 Oceans Ballroom. 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 22 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

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

Physics of Contrast Enhancement

Session Chairs: **Christoph Hoeschen,** Otto-von-Guericke-Univ. Magdeburg (Germany); **John Yorkston,** Carestream Health, Inc. (USA)

8:00 am: **The impact of imaging research on medicine and society: translating research into products** *(Invited Paper)*, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9412-1]

8:40 am: **Complementary contrast media for metal artifact reduction in dual-energy CT**, Jack Lambert, Univ. of California, San Francisco (USA); Peter M. Edic, Paul F. Fitzgerald, Andrew A. Torres, GE Global Research (USA); Benjamin M. Yeh, Univ. of California, San Francisco (USA) . . . . . [9412-2]

9:00 am: **Preliminary study of copper oxide nanoparticles acoustic and magnetic properties for medical imaging**, Or Perlman, Technion-Israel Institute of Technology (Israel); Iris S. Weitz, ORT Braude College (Israel); Haim Azhari, Technion-Israel Institute of Technology (Israel) . . . . . [9412-3]

9:20 am: **Determination of contrast media administration to achieve a targeted contrast enhancement in CT**, Pooyan Sahbaee, Yuan Lin, William P. Segars, Carl E.Ravin Advanced Imaging Labs., Duke Univ. (USA); Daniele Marin, Rendon Nelson, Duke Univ. (USA); Ehsan Samei, Carl E.Ravin Advanced Imaging Labs., Duke Univ. (USA) . . . . . [9412-4]

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

9412 continues on page 27

CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

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

Musculoskeletal and Miscellaneous

Session Chairs: **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA); **Rafael Wiemker,** Philips Research (Germany)

8:00 am: **Automatic diagnosis of inflammatory muscle disease for MRI using computer-extracted features of bivariate histograms**, James V. Jack, Loughborough Univ. (UK); Terence A. Jones, Charles E. Hutchinson, The Univ. of Warwick (UK); Helmut E. Bez, Eran A. Edirisinghe, Loughborough Univ. (UK). . . . . [9414-1]

8:20 am: **Segmentation of the sternum from low-dose chest CT images**, Shuang Liu, Yiting Xie, Anthony P. Reeves, Cornell Univ. (USA) . . . . . [9414-2]

8:40 am: **Detection of degenerative change in lateral projection cervical spine x-ray images**, Beyrem Jebri, Ecole Nationale Superieure D'Informatique Pour L'Industrie et L'Entreprise (France); Michael Phillips, City Univ. London (UK); Karen Knapp, Univ. of Exeter (UK); Andy Appelboam, Royal Devon and Exeter Hospital, NHS (UK); Adam Reuben, Royal Devon and Exeter Hospital, RHS (UK); Greg Slabaugh, City Univ. London (UK). . . . . [9414-3]

9:00 am: **Diagnostic index of 3D osteoarthritic changes in TMJ condylar morphology**, Liliane R. Gomes, Univ. of Michigan (USA) and Univ. Estadual Paulista (Brazil); Marcelo Gomes, Bryan Jung, Univ. of Michigan (USA); Beatriz Paniagua, The Univ. of North Carolina at Chapel Hill (USA); Antonio C. Ruellas, Univ. of Michigan (USA); João Roberto Gonçalves, Univ. Estadual Paulista (Brazil); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA); Larry M. Wolford, Baylor University Medical Center (USA); Lucia Cevidanes, Univ. of Michigan (USA). . . . . [9414-4]

9:20 am: **3D statistical shape models incorporating 3D random forest regression voting for robust CT liver segmentation**, Tobias Norajitra, Hans-Peter Meinzer, Klaus H. Maier-Hein, Deutsches Krebsforschungszentrum (Germany) [9414-5]

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

9414 continues on page 27

CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 1
Room: Oceans 4 . . . . Sun 8:00 am to 9:55 am

Cardiac Procedures

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

8:00 am: **Integration of a biomechanical simulation for mitral valve reconstruction into a knowledge-based surgery assistance system**, Nicolai J. Schoch, Ruprecht-Karls-Univ. Heidelberg (Germany); Sandy Engelhardt, Deutsches Krebsforschungszentrum (Germany); Norbert Zimmermann, UniversitätsKlinikum Heidelberg (Germany); Stefanie Speidel, Karlsruher Institut für Technologie (Germany); Raffaele De Simone, UniversitätsKlinikum Heidelberg (Germany); Ivo Wolf, Fachhochschule Mannheim (Germany) and Deutsches Krebsforschungszentrum (Germany); Vincent Heuveline, Ruprecht-Karls-Univ. Heidelberg (Germany). . . [9415-1]

8:20 am: **A dynamic heart phantom with functional mitral and aortic valves**, Claire Vannelli, John T. Moore, Jonathan McLeod, Dennis A. Ceh, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9415-2]

8:40 am: **Beating heart mitral valve repair with integrated ultrasound imaging**, A. Jonathan McLeod, John T. Moore, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9415-3]

9:00 am: **Endocardial left ventricle feature tracking and reconstruction from tri-plane TEE data for computer-assisted image guidance and cardiac function assessment**, Shusil Dangi, Yehuda K. Ben-Zikri, Rochester Institute of Technology (USA); Karl Q. Schwarz, Univ. of Rochester Medical Ctr. (USA) and Rochester Institute of Technology (USA); Nathan Cahill, Cristian A. Linte, Rochester Institute of Technology (USA). . . . . [9415-4]

9:20 am: **The effect of elastic modulus on ablation catheter contact area**, Jon J. Camp, Mayo Clinic (USA); Cristian A. Linte, Rochester Institute of Technology (USA); Maryam E. Rettmann, Deyu Sun, Douglas L. Packer, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA); David R. Holmes III, Mayo Clinic (USA) . . . . [9415-5]

9:40 am: **In memoriam Ferenc Jolesz**, Gabor Fichtinger, Queen's Univ. (Canada) . . . . . [9415-96]

Coffee Break . . . . . Sun 9:55 am to 10:10 am

9415 continues on page 27

CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations
Rooms: Crystal E

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

Keynote and Big Data

Session Chair: **Tessa S. Cook,** The Univ. of Pennsylvania Health System (USA)

8:00 am: **Practical applications and pitfalls of 'big data' for decision support in medical imaging and informatics** *(Keynote Presentation)*, Eliot L. Siegel, Univ. of Maryland Medical Ctr. (USA) . . . . . [9418-1]

9:00 am: **Big data issues in medical imaging informatics**, Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . . [9418-2]

Q&A. . . . . Sun 9:20 am to 9:40 am

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

9418 continues on page 27

CONFERENCE 9419
Ultrasonic Imaging and Tomography
Room: Oceans 2

SESSION 1
Room: Oceans 2 . . . . Sun 8:00 am to 9:40 am

Motion and Deformation Imaging, Novel Imaging Approaches

Session Chair: **Brecht Heyde,** Katholieke Univ. Leuven (Belgium)

8:00 am: **Transverse oscillation vector flow imaging for transthoracic echocardiography**, David P. Bradway, Technical Univ. of Denmark (Denmark); Kristoffer L. Hansen, Michael B. Nielsen, Copenhagen Univ. Hospital Rigshopitalet (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . [9419-1]

8:20 am: **Endoleak and thrombus characterization with dynamic elastography after endoleak embolization following aneurysm endovascular repair**, Antony Bertrand-Grenier, Ctr. Hospitalier de l'Univ. de Montréal (Canada); Fatemeh Zehtabi, Ctr Hospitalier de l'Univ. de Montréal (Canada) and Ecole de Technologie Supérieure (Canada) and Endovascular Biomaterials Laboratory (LBeV) (Canada); Claude Kauffmann, Guy Cloutier, Ctr. Hospitalier de l'Univ. de Montréal (Canada); Sophie Lerouge, Ctr Hospitalier de l'Univ. de Montréal (Canada) and Ecole de Technologie Supérieure (Canada); Gilles Soulez, Ctr. Hospitalier de l'Univ. de Montréal (Canada) . . . . . [9419-2]

8:40 am: **Automated hierarchical time gain compensation for in-vivo ultrasound umaging**, Ramin Moshavegh, Martin C. Hemmsen, Technical Univ. of Denmark (Denmark); Bo Martins, BK Medical (Denmark); Andreas H. Brandt, Kristoffer L. Hansen, Copenhagen Univ. Hospital Rigshopitalet (Denmark); Michael Bachmann Nielsen M.D., Copenhagen University Hospital (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . [9419-3]

9:00 am: **Characterization of neonatal patients with intraventricular hemorrhage using 3D ultrasound cerebral ventricle volumes**, Jessica Kishimoto, Aaron Fenster, Robarts Research Institute (Canada); David S. C. Lee, Sandrine de Ribaupierre, London Health Sciences Ctr. (Canada) . . . . . [9419-4]

9:20 am: **3D in vivo imaging of rat hearts by high frequency ultrasound and its application in myofiber orientation wrapping**, Xulei Qin, Silun Wang, Ming Shen, Xiaodong Zhang, Emory Univ. (USA); Stamatios Lerakis, Emory Univ (USA); Mary B. Wagner, Baowei Fei, Emory Univ. (USA) . . . . . [9419-5]

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

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SUNDAY 22 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 2
Room: Crystal C . . Sun 10:10 am to 12:10 pm

Image Reconstruction
Session Chairs: **Kirsten Boedeker,** Toshiba Medical Research Institute USA (USA); **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA)

10:10 am: **Application of a non-convex smooth hard threshold regularizer to sparse-view CT image reconstruction**, Sean D. Rose, Emil Y. Sidky, Xioachuan Pan, The Univ. of Chicago (USA) . . . . . [9412-5]

10:30 am: **Cone-beam CT of traumatic brain injury using statistical reconstruction with a post-artifact-correction noise model**, Hao Dang, Joseph W. Stayman, Alejandro Sisniega, Jennifer Xu, Wojciech Zbijewski, Johns Hopkins Univ. (USA); John Yorkston, Carestream Health, Inc. (USA); Nafi Aygun, Vassilis Koliatsos, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA). . . . . [9412-6]

10:50 am: **Fat-constrained 18F-FDG PET reconstruction using Dixon MR imaging and the origin ensemble algorithm**, Christian Wülker, Ruprecht-Karls-Univ. Heidelberg, Mannheim Medical Faculty (Germany); Susanne Heinzer, Philips AG Healthcare (Switzerland); Peter Börnert,Steffen Renisch,Sven Prevrhal, Philips Research (Germany). . . . . [9412-7]

11:10 am: **Feasibility of CT-based 3D anatomic mapping with a scanning-beam digital x-ray (SBDX) system**, Jordan M. Slagowski, Michael T. Tomkowiak, David A. P. Dunkerley, Michael A. Speidel, Univ. of Wisconsin-Madison (USA) . . . . . [9412-8]

11:30 am: **Clinical image benefits after model-based reconstruction for low dose dedicated breast tomosynthesis**,

Eri Haneda, J. Eric Tkaczyk, GE Global Research (USA); Giovanni J. Palma, Răzvan Iordache, Serge L. Muller, GE Healthcare (France); Bruno De Man, GE Global Research (USA). . . . . [9412-9]

11:50 am: **Rank-sparsity constrained, spectro-temporal reconstruction for retrospectively gated, dynamic CT**, Darin P. Clark, Duke Univ. Medical Ctr., Ctr. for In Vivo Microscopy (USA); Chang-Lung Lee, David G. Kirsch, Duke Univ. Medical Ctr. (USA); Cristian T. Badea, Ctr. for In Vivo Microscopy (USA) . . . . . [9412-10]

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

9412 continues on page 28

CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 2
Room: Crystal D . . Sun 10:10 am to 12:10 pm

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

10:10 am: **Pulmonary embolism detection using localized vessel-based features in dual energy CT**, Yashin Dicente Cid, HES-SO Valais (Switzerland) and Univ. of Geneva (Switzerland); Adrien Depeursinge, Antonio Foncubierta Rodríguez, HES-SO Valais (Switzerland); Alexandra Platon, Pierre-Alexandre Poletti, Hôpitaux Univ. de Genève (Switzerland); Henning Müller, HES-SO Valais (Switzerland) and Univ. of Geneva (Switzerland) . . . . . [9414-6]

10:30 am: **Robustness evaluation of a computer-aided detection system for pulmonary embolism (PE) in CTPA using independent test sets from multiple institutions**, Chuan Zhou, Heang-Ping Chan, Aamer R. Chughtai, Jean W. Kuriakose, Ella A. Kazerooni, Lubomir M. Hadjiiski, Jun Wei, Smita Patel, Univ. of Michigan Health System (USA) . . . [9414-7]

10:50 am: **Automatic detection of spiculation of pulmonary nodules in computed tomography images**, Francesco Ciompi, Radboud Univ. Nijmegen (Netherlands); Colin Jacobs, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Ernst T. H. Scholten, Sarah van Riel, Diagnostic Image Analysis Group (Netherlands); Mathilde M. Winkler Wille, Gentofte Hospital (Denmark); Mathias Prokop, Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9414-8]

11:10 am: **Improving CAD performance by seamless insertion of pulmonary nodules in chest CT exams**, Aria X. Pezeshk, Berkman Sahiner, Weijie Chen, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9414-9]

11:30 am: **Analysis of the Vancouver lung nodule malignancy model with respect to manual and automated segmentation**, Rafael Wiemker, Philips Research (Germany); Lilla Boroczky, Philips Research North America (USA); Martin Bergtholdt, Tobias Klinder, Philips Research (Germany). . . . . [9414-10]

11:50 am: **Factors affecting uncertainty in lung nodule volume estimation with CT: comparisons of findings from two estimation methods in a phantom study**, Qin Li, Marios A. Gavrielides, U.S. Food and Drug Administration (USA); Rongping Zeng, Kyle J. Myers, Berkman Sahiner, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9414-11]

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

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 2
Room: Oceans 4 . . Sun 10:10 am to 12:10 pm

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

10:10 am: **Multimodal system for the planning and guidance of bronchoscopy**, William E. Higgins, Ronnarit Cheirsilp, Xiaonan Zang, Patrick D. Byrnes, The Pennsylvania State Univ. (USA). . . . [9415-6]

10:30 am: **Accuracy validation of an image guided laparoscopy system for liver resection**, Stephen A. Thompson, Johannes Totz, Yi Song, Univ. College London (UK); Stian Johnsen, Univ. College London (UK); Danail Stoyanov, Sébastien Ourselin, Univ. College London (UK); Kurinchi Gurusamy, Crispin Scheider, Brian Davidson, Division of Surgery and Interventional Science, UCL (UK); David Hawkes, Matthew Clarkson, Univ. College London (UK) . . . . . [9415-7]

10:50 am: **Rendering-based video-CT registration with physical constraints for image-guided endoscopic sinus surgery**, Yoshito Otake, Nara Institute of Science and Technology (Japan); Simon Leonard, Austin Reiter, Purnima Rajan, Jeffrey H. Siewerdsen, Masaru Ishii, Russell H. Taylor, Gregory D. Hager, Johns Hopkins Univ. (USA) . . . . . [9415-8]

11:10 am: **Image-based tracking of the suturing needle during laparoscopic interventions**, Stefanie Speidel, Andrea Kroehnert, Sebastian Bodenstedt, Karlsruher Institut für Technologie (Germany); Hannes Kenngott, Beat Peter Müller-Stich, UniversitätsKlinikum Heidelberg (Germany); Rüdiger Dillmann, Karlsruher Institut für Technologie (Germany) . . . . . [9415-9]

11:30 am: **Toward real-time endoscopically-guided robotic navigation based on a 3D virtual surgical field model**, Yuanzheng Gong, Danying Hu, Blake Hannaford, Eric J. Seibel, Univ. of Washington (USA)[9415-10]

11:50 am: **Electrical impedance map (EIM) for margin assessment during robot-assisted laparoscopic prostatectomy (RALP) using a microendoscopic probe**, Aditya Mahara, Shadab Khan, Thayer School of Engineering at Dartmouth (USA); Alan R. Schned, Elias S. Hyams, Dartmouth Hitchcock Medical Ctr. (USA); Ryan J. Halter, Thayer School of Engineering at Dartmouth (USA) . . . . . [9415-11]

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

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CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations
Rooms: Crystal E

SESSION 2
Room: Crystal E . . .Sun 10:10 am to 12:10 pm

Big Data in Medical Imaging and Informatics
Session Chair: **Jianguo Zhang,** Shanghai Institute of Technical Physics (China)

10:10 am: **Review of clinical documentation and data storage systems: a must and burden - Prospects on future use of big data for analyses in radiation oncology**, Kerstin A. Kessel, Stephanie E. Combs, Technische Univ. München (Germany) . . . . . [9418-3]

10:30 am: **What makes 'Big data' different from 'regular data' within Radiology? The easiest answer; When it no longer fits into Excel!**, Lars Lindsköld, Västra Götaland (Sweden) and Karolinska Institutet (Sweden); G. Alvfeldt, Karolinska Institutet (Sweden) and SLL (Sweden); Mikael Wintell, Västra Götaland (Sweden). . . . . [9418-4]

10:50 am: **Interactive analysis of geographically distributed population imaging data collections over light-path data networks**, Baldur van Lew, Leiden Univ. Medical Ctr. (Netherlands); Charl P. Botha, vxlabs (Pty) Ltd. (South Africa); Julien R. Milles, Philips Healthcare (Netherlands); Henri A. Vrooman, Erasmus MC (Netherlands); Martijn van de Giessen, Boudewijn P. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands) . . . . . [9418-5]

11:10 am: **Towards secondary use of heterogeneous radio-oncological data for retrospective clinical trials: service-oriented connection of a central research database with image analysis tools**, Nina Bougatf, UniversitätsKlinikum Heidelberg (Germany) and German Cancer Research Ctr. (Germany); Rolf Bendl, Deutsches Krebsforschungszentrum (Germany) and Hochschule Heilbronn (Germany); Jürgen Debus, UniversitätsKlinikum Heidelberg (Germany) . . . . . [9418-6]

11:30 am: **Visualizing and representing trends in research fields' dynamics such as medical imaging**, Philippe F. Journeau, ResearXis, Inc. (USA) . . . . . [9418-7]

11:50 am: **Big data in multiple sclerosis: development of a web-based longitudinal study viewer in an imaging informatics-based eFolder system for complex data analysis and management**, Kevin C. Ma, Ximing Wang, Alex Lerner, Mark Shiroishi, Lilyana Amezcua, Alexander Tarashansky, Brent J. Liu, The Univ. of Southern California (USA). . . . . [9418-40]

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

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CONFERENCE 9419
Ultrasonic Imaging and Tomography
Room: Oceans 2

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

Keynote and Photoacoustics and Acoustic Microscopy
Session Chair: **Neb Duric,** Delphinus Medical Technologies (USA)

10:10 am: **Synergistic integration of photoacoustic and ultrasound computed tomography** *(Keynote Presentation)*, Mark A. Anastasio, Washington Univ. in St. Louis (USA) . . . . . [9419-6]

10:50 am: **Feasibility study of robotically tracked photoacoustic computed tomography**, Haichong K. Zhang, Kyoto Univ. Graduate School of Medicine (Japan); Hyun Jae Kang, Johns Hopkins Univ. (USA); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . . . . . [9419-7]

11:10 am: **Opto-acoustic image fusion technology for diagnostic breast imaging in a feasibility study**, Jason Zalev, Bryan Clingman, Phil Lavin, Don Herzog, Thomas Miller, Michael Ulissey, A. Thomas Stavros, Seno Medical Instruments, Inc. (USA); Alexander A. Oraevsky, TomoWave Laboratories, Inc. (USA); Kenneth Kist, N. Carol Dornbluth, Pamela M. Otto, The Univ. of Texas Health Science Ctr. at San Antonio (USA). [9419-8]

11:30 am: **Design and manufacturing of scanning probe acoustic microscope test phantom**, Xiaohui Chen, Xiaoyue Fang, Jitao Song, Mingyue Ding, Huazhong Univ. of Science and Technology (China) . . . . . [9419-9]

11:50 am: **The study of photoacoustic imaging without nanoparticles as a contrast agent for anti-body drug monitoring**, Seung Hee Han, Sogang Univ. (Korea, Republic of) and Univ. of Toronto (Canada) and Univ. Health Network (Canada); Jeeun Kang, Sogang Univ. (Korea, Republic of); Brian C. Wilson, Univ. Health Network (Canada) and Univ. of Toronto (Canada); Tai Kyong Song, Sogang Univ. (Korea, Republic of); Young Il Kim, Seoul National Univ. College of Medicine (Korea, Republic of) . . . . . [9419-10]

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

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SUNDAY 22 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

SESSION 3
Room: Crystal C . . . . Sun 1:20 pm to 3:00 pm

Detector Technology

Session Chairs: **Karim S. Karim,** Univ. of Waterloo (Canada); **Wei Zhao,** Stony Brook Medicine (USA)

1:20 pm: **Low-dose performance of wafer-scale CMOS-based X-ray detectors**, Willem Maes, Inge M. Peters, Chiel Smit, Yves A. R. R. Kessener, Jan T. Bosiers, Teledyne DALSA (Netherlands). . . . . [9412-11]

1:40 pm: **Apodized-aperture pixel design to increase high-frequency DQE and reduce noise aliasing in x-ray detectors**, Ian A. Cunningham, Robarts Research Institute (Canada) and Western Univ. (Canada); Elina Ismailova, Western Univ. (Canada); Karim S. Karim, Univ. of Waterloo (Canada) . . . . . [9412-12]

2:00 pm: **Low dose digital X-ray imaging with avalanche amorphous selenium**, James R. Scheuermann, Amir H. Goldan, Yesenia Miranda, Hongyu Liu, Stony Brook Univ. (USA); Olivier Tousignant, Sébastien Léveillé, Analogic Canada Corp. (Canada); Wei Zhao, Stony Brook Univ. (USA) . . . . . [9412-13]

2:20 pm: **Multi-energy imagers for a radiotherapy treatment environment**, Larry E. Antonuk, Langechuan Liu, Albert K. Liang, Youcef El-Mohri, Qihua Zhao, Martin Koniczek, Hao Jiang, Univ. of Michigan (USA) . . . . . [9412-14]

2:40 pm: **Investigation of the screen optics of thick CsI(Tl) detectors**, Adrian F. Howansky, Boyu Peng, Stony Brook Univ. (USA); Katsuhiko Suzuki, Masanori Yamashita, Hamamatsu Photonics K.K. (Japan); Anthony R. Lubinsky, Wei Zhao, Stony Brook Univ. (USA). . . . . [9412-15]

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

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CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

SESSION 3
Room: Crystal D . . . . Sun 1:20 pm to 3:00 pm

Vessels, Heart and Eye I

Session Chairs: **Heang-Ping Chan,** Univ. of Michigan Health System (USA); **Stephen Aylward,** Kitware, Inc. (USA)

1:20 pm: **Automatic machine learning based prediction of cardiovascular events in lung cancer screening data**, Bob D. de Vos, Pim A. de Jong, Jelmer M. Wolterink, Univ. Medical Ctr. Utrecht (Netherlands); Rozemarijn Vliegenthart, Univ. of Groningen (Netherlands); Geoffrey Wielingen, Max A. Viergever, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [9414-12]

1:40 pm: **Automatic selection of best quality vessels from multiple-phase coronary CT angiography (cCTA)**, Jordan Liu, Univ. of Michigan (USA); Lubomir M. Hadjiiski, Heang-Ping Chan, Chuan Zhou, Jun Wei, Aamer R. Chughtai, Jean W. Kuriakose, Ella A. Kazerooni, Univ. of Michigan Health System (USA) [9414-13]

2:00 pm: **Determining degree of optic nerve edema from fundus photography**, Jason C. Agne, Jui-Kai Wang, The Univ. of Iowa (USA); Mona K. Garvin, The Univ. of Iowa (USA) and Iowa City VA Health Care System (USA); Randy H. Kardon, U.S. Dept. of Veterans Affairs (USA) . . [9414-14]

2:20 pm: **Automated segmentation of cardiac visceral fat in low-dose non-contrast chest CT images**, Yiting Xie, Cornell Univ. (USA); Mingzhu Liang, David F. Yankelevitz, Claudia I. Henschke, Icahn School of Medicine at Mount Sinai (USA); Anthony P. Reeves, Cornell Univ. (USA) . . . . . [9414-15]

2:40 pm: **Development of a screening tool for staging of diabetic retinopathy in fundus images**, Ashis K. Dhara, Sudipta Mukhopadhyay, Indian Institute of Technology Kharagpur (India); Mayur J. Bency, Indian Institute of Technology Indore (India); Rangaraj M. Rangayyan, Univ. of Calgary (Canada); Reema Bansal, Post Graduate Institute of Medical Education and Research, Chandigarh (India); Amod Gupta, Post Graduate Institute of Medical Education and Research (India) . . . . . [9414-16]

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

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: Oceans 4

SESSION 3
Room: Oceans 4 . . . . Sun 1:20 pm to 3:00 pm

Cranial Procedures

Session Chairs: **Frank Sauer,** Siemens Corp., Corporate Technology (USA); **Michael I. Miga,** Vanderbilt Univ. (USA)

1:20 pm: **Thalamic nuclei segmentation in clinical 3T T1-weighted Images using high-resolution 7T shape models**, Yuan Liu, Pierre-François D'Haese, Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . . [9415-12]

1:40 pm: **Three-dimensional curvilinear device reconstruction from two fluoroscopic views**, Charlotte Delmas, GE Healthcare France (France) and LORIA (France); Marie-Odile Berger, Erwan Kerrien, INRIA (France) and LORIA (France); Cyril Riddell, Yves L. Trousset, GE Healthcare France (France); René Anxionnat, Serge Bracard, CHU, Hôpital Neurologique (France) . . . . . [9415-13]

2:00 pm: **Localizing and tracking electrodes using stereovision in epilepsy cases**, Xiaoyao Fan, Songbai Ji, Dartmouth College (USA); David W. Roberts, Dartmouth Hitchcock Medical Ctr. (USA) and Dartmouth College (USA); Keith D. Paulsen, Dartmouth College (USA) . . . . . [9415-14]

2:20 pm: **Real-time surgery simulation of intracranial aneurysm clipping with patient-specific geometries and haptic feedback**, Wolfgang Fenz, Johannes Dirnberger, RISC Software GmbH (Austria) . . . . . [9415-15]

2:40 pm: **Application and histology-driven refinement of active contour models to functional region and nerve delineation: towards a digital brainstem atlas**, Sharmin Sultana, Michel A. Audette, Nirmal Patel, Old Dominion Univ. (USA) . . . . . [9415-16]

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

9415 continues on page 29

CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations

Rooms: Crystal E

SESSION 3
Room: Crystal E . . . . .Sun 1:20 pm to 3:00 pm

Advanced PACS-Based Radiology Workflow and Image Sharing

Session Chair: **Brent J. Liu,** The Univ. of Southern California (USA)

1:20 pm: **Web-based PACS and EHR system**, Ashesh Parikh, Nihal Mehta, netDICOM (USA). . . . . [9418-8]

1:40 pm: **Web-based platform for collaborative medical imaging research**, Leticia Rittner, Mariana P. Bento, André L. Costa, Roberto M. Souza, Rubens C. Machado, Roberto A. Lotufo, Univ. Estadual de Campinas (Brazil). . . . [9418-9]

2:00 pm: **On-line scalable image access for medical remote collaborative meetings**, Sebastian R. Tarando, Télécom SudParis (France); Olivier Lucidarme, Philippe A. Grenier, Pitié-Salpêtrière Hospital (France); Catalin Fetita, Télécom SudParis (France) . . . . . [9418-10]

2:20 pm: **Integrating research and clinical neuroimaging for the evaluation of traumatic brain injury recovery**, Justin Senseney, John M. Ollinger, John Graner, Wei Lui, Terry Oakes, Gerard Riedy, National Intrepid Ctr. of Excellence (USA) . . . . . [9418-11]

2:40 pm: **Characterizing stroke lesions using digital templates and computer-aided lesion quantification tools in a web-based imaging informatics system for a large-scale stroke rehabilitation clinical trial**, Ximing Wang, The Univ. of Southern California (USA); Matthew Edwardson, National Institutes of Health (USA); Alexander Dromerick, MedStar National Rehabilitation Network (USA); Carolee J. Winstein, Jing Wang, Brent J. Liu, The Univ. of Southern California (USA) . . . . . [9418-12]

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

9418 continues on page 29

CONFERENCE 9419
Ultrasonic Imaging and Tomography

Room: Oceans 2

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

Ultrasound Computer Tomography I

Session Chair: **Nicole V. Ruiter,** Karlsruher Institut für Technologie (Germany)

1:20 pm: **Breast ultrasound computed tomography using waveform inversion with source encoding**, Kun Wang, Thomas P. Matthews, Fatima Anis, Washington Univ. in St. Louis (USA); Cuiping Li, Delphinus Medical Technologies (USA); Neb Duric, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA); Mark A. Anastasio, Washington Univ. in St. Louis (USA). . . . . [9419-11]

1:40 pm: **High-resolution quantitative whole-breast ultrasound: in vivo application using frequency-domain waveform tomography**, Gursharan S. Sandhu, Wayne State Univ. (USA); Cuiping Li, Olivier Roy, Delphinus Medical Technologies (USA) and Wayne State Univ. (USA); Neb Duric, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA); Steven Schmidt, Delphinus Medical Technologies (USA) and Wayne State Univ. (USA). . . . . [9419-12]

2:00 pm: **GPU-based 3D SAFT reconstruction including attenuation correction**, Ernst Kretzek, Torsten Hopp, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany). . . . . [9419-13]

2:20 pm: **Bent ray ultrasound tomography reconstruction using virtual receivers for reducing time cost**, Xiaolei Qu, Takashi Azuma, Hirofumi Nakamura, Haruka Imoto, The Univ. of Tokyo (Japan); Satoshi Tamano, Tohoku Univ. (Japan); Shu Takagi, The Univ. of Tokyo (Japan); Shin-Ichiro Umemura, Tohoku Univ. (Japan); Ichiro Sakuma, Yoichiro Matsumoto, The Univ. of Tokyo (Japan) . . . . . [9419-14]

2:40 pm: **Whole breast tissue characterization with ultrasound tomography**, Neb Duric, Peter J. Littrup, Olivier Roy, Steven Schmidt, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA); Veerendra Allada, Delphinus Medical Technologies (USA); Cuiping Li, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA); John Seamans, Delphinus Medical Technologies (USA); Lisa Bey-Knight, Karmanos Cancer Institute (USA) . . [9419-15]

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

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SUNDAY 22 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

SESSION 4
Room: Crystal C . Sun 3:30 pm to 5:30 pm

Phase Contrast Imaging
Session Chairs: **John M. Sabol,** GE Healthcare (USA);
Bruce R. Whiting, Univ. of Pittsburgh (USA)

3:30 pm: **New signal extraction method to enable single exposure data acquisitions in grating-based multi-contrast imaging system without mechanical phase stepping and object translation**, Yongshuai Ge, John W. Garrett, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-16]

3:50 pm: **Phase-contrast x-ray imaging and Compton scattering at 120 keV**, Matteo Abis, Paul Scherrer Institut (Switzerland) and ETH Zurich (Switzerland); Zhentian Wang, Paul Scherrer Institut (Switzerland); Marco F. M. Stampanoni, ETH Zurich (Switzerland) and Paul Scherrer Institut (Switzerland). . . . . [9412-17]

4:10 pm: **Phase-contrast imaging using radiation sources based on laser-plasma wakefield accelerators: state of the art and future development**, David Reboredo Gil, Silvia Cipiccia, Peter A. Grant, Gregor H. Welsh, David William Grant, Graeme McKendrick, Univ. of Strathclyde (UK); Anna Subiel, National Physical Lab. (UK); Dima Maneuski, Univ. of Glasgow (UK); Samuel M. Wiggins, Dino A. Jaroszynski, Univ. of Strathclyde (UK) . . . . . [9412-18]

4:30 pm: **Laboratory implementation of edge illumination X-ray phase-contrast imaging with energy-resolved detectors**, Paul C. Diemoz, Marco Endrizzi, Fabio A. Vittoria, Charlotte K. Hagen, Univ. College London (UK); Gibril Kallon, Dario Basta, Univ College London (UK); Massimo Marenzana, Kennedy Institute of Rheumatology, Univ. of Oxford (UK); Pasquale Delogu, Istituto Nazionale di Fisica Nucleare (Italy); Alessandro Vincenzi, PIXIRAD Imaging Counters s.r.l. (Italy); Luca De Ruvo, Istituto Nazionale di Fisica Nucleare (Italy); Gloria Spandre, Alessandro Brez, Ronaldo Bellazzini, Istituto Nazionale di Fisica Nucleare (Italy) and PIXIRAD Imaging Counters s.r.l. (Italy); Alessandro Olivo, Univ. College London (UK) . . . . . [9412-19]

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CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

SESSION 4
Room: Crystal D . . . . Sun 3:30 pm to 5:30 pm

Breast I
Session Chairs: **Joseph Y. Lo,** Duke Univ. School of Medicine (USA); **Hiroshi Fujita,** Gifu Univ. School of Medicine (Japan)

3:30 pm: **Segmentation of the whole breast from low-dose chest CT Images**, Shuang Liu, Cornell Univ. (USA); Mary Salvatore, David F. Yankelevitz, Claudia I. Henschke, Mount Sinai School of Medicine (USA); Anthony P. Reeves, Cornell Univ. (USA) . . . . . [9414-17]

3:50 pm: **Vessel segmentation in screening mammograms**, Jan-Jurre Mordang, Nico Karssemeijer, Radboud Univ. Medical Ctr. (Netherlands) . [9414-18]

4:10 pm: **Comparison of computer-aided detection of clustered microcalcifications in digital mammography and digital breast tomosynthesis**, Ravi K. Samala, Heang-Ping Chan, Yao Lu, Lubomir M. Hadjiiski, Jun Wei, Mark A. Helvie, Univ. of Michigan (USA) . . . . . [9414-19]

4:30 pm: **Initial experience with computer aided detection for microcalcification in digital breast tomosynthesis**, Elaine F Harkness, Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Nightingale and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK); Yit Y. Lim, Mary W. Wilson, Rabea Haq, Jin Zhou, Catriona Tate, Nightingale and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK); Anthony J. Maxwell, Nightingale and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK) and Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Manchester Cancer Research Ctr., The Univ. of Manchester (UK); Susan M. Astley, Centre for Imaging Sciences, The Univ. of Manchester (UK) and Nightingale and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK) and Manchester Cancer Research Ctr., The Univ. of Manchester (UK); Fiona J. Gilbert, School of Clinical Medicine, Univ. of Cambridge (UK) . . . . . [9414-42]

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: Oceans 4

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

Treatment Planning and Robotic Systems
Session Chairs: **David M. Kwartowitz,** Clemson Univ. (USA); **Gabor Fichtinger,** Queen's Univ. (Canada)

3:30 pm: **Comparison of tablet-based strategies for incision planning in laser microsurgery**, Andreas Schoob, Stefan Lekon, Dennis Kundrat, Lüder A. Kahrs, Leibniz Univ. Hannover (Germany); Leonardo S. Mattos, Istituto Italiano di Tecnologia (Italy); Tobias Ortmaier, Leibniz Univ. Hannover (Germany) . . . . . [9415-17]

3:50 pm: **Automatic electrode configuration selection for image-guided cochlear implant programming**, Yiyuan Zhao, Benoit M. Dawant, Jack H. Noble, Vanderbilt Univ. (USA) . . . [9415-18]

4:10 pm: **Nonholonomic catheter path reconstruction using electromagnetic tracking**, Elodie Lugez, Hossein Sadjadi, Selim G. Akl, Gabor Fichtinger, Queen's Univ. (Canada). . . . . [9415-19]

4:30 pm: **Methods for intraoperative, sterile pose-setting of patient-specific microstereotactic frames**, Benjamin Vollmann, Samuel Müller, Dennis Kundrat, Tobias Ortmaier, Lüder A. Kahrs, Leibniz Univ. Hannover (Germany) . . . . . [9415-20]

4:50 pm: **Robot-assisted, ultrasound-guided minimally invasive navigation tool for brachytherapy and ablation therapy: initial assessment**, Srikanth Bhattad, Abelardo Escoto, Canadian Surgical Technologies and Advanced Robotics (Canada); Richard Malthaner, Canadian Surgical Technologies and Advanced Robotics (Canada) and Univ. of Western Ontario (Canada); Rajni Patel, Canadian Surgical Technologies and Advanced Robotics (Canada) and Western Univ. (Canada). . . . . [9415-21]

5:10 pm: **Generating patient-specific pulmonary vascular models for surgical planning**, Daniel Murff, Jennifer Co-Vu, Walter G. O'Dell, Univ. of Florida (USA) . . . . . [9415-22]

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CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations

Rooms: Crystal E

SESSION 4
Room: Crystal E . . Sun 3:30 pm to 5:10 pm

New Technologies and Concepts for PACS and Imaging Informatics
Session Chair: **Thomas M. Deserno,** RWTH Aachen (Germany)

3:30 pm: **PACS on mobile devices**, Ashesh Parikh, Nihal Mehta, netDICOM (USA) . . . . . [9418-13]

3:50 pm: **PACS: next generation**, Ashesh Parikh, Nihal Mehta, netDICOM (USA) . . . . . [9418-14]

4:10 pm: **Web-based 3D digital pathology framework for large-mapping data scanned by FFOCT**, ChiaKai Chang, Chien-Chung K. Tsai, Meng-Ting Chien, National Taiwan Univ. (Taiwan); Yu-I Li, Chia-Tung Shun, National Taiwan Univ. College of Medicine (Taiwan); Sheng-Lung L. Huang, National Taiwan Univ. (Taiwan) . . . . . [9418-15]

4:30 pm: **Volumetric MRI visualisation through digitally reconstructed radiographs**, Antoine Serrurier, Andrea Boensch, Robert Lau, Thomas M. Deserno, RWTH Aachen Univ. (Germany) . . [9418-16]

4:50 pm: **OpenID connect as a security service in Cloud-based diagnostic imaging systems**, Weina Ma, Kamran Sartipi, Hassan Sharghi, Univ. of Ontario Institute of Technology (Canada); David A Koff, McMaster Univ. (Canada); Peter R.G. Bak, MIIRC@M (Canada) . . . . . [9418-17]

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CONFERENCE 9419
Ultrasonic Imaging and Tomography

Room: Oceans 2

SESSION 4
Room: Oceans 2 . . . . Sun 3:30 pm to 5:30 pm

Transducers, Beamforming, Systems
Session Chair: **Jørgen Arendt Jensen,** Technical Univ. of Denmark (Denmark)

3:30 pm: **Implementation of swept synthetic aperture imaging**, Nick Bottenus, Marko Jakovljevic, Duke Univ. (USA); Emad M. Boctor, Johns Hopkins Univ. (USA); Gregg E. Trahey, Duke Univ. (USA) . . . . . [9419-16]

3:50 pm: **In vivo real-time volumetric synthetic aperture ultrasound imaging**, Hamed Bouzari, Jørgen A. Jensen, Morten F. Rasmussen, Technical Univ. of Denmark (Denmark); Svetoslav I. Nikolov, BK Medical (Denmark); Andreas H. Brandt, Copenhagen Univ. Hospital Rigshopitalet (Denmark); Matthias B. Stuart, Technical Univ. of Denmark (Denmark) . . . . [9419-17]

4:10 pm: **Spatio-temporally smoothed coherence weighting combined with forward-backward minimum variance for ultrasound imaging**, Xu Li, Huazhong Univ. of Science and Technology (China) . . . . . [9419-18]

4:30 pm: **Synthetic aperture imaging using a semi-analytic model for the transmit beams**, Jens Munk Hansen, Svetoslav I. Nikolov, BK Medical (Denmark) . . . . . [9419-19]

4:50 pm: **Synthetic aperture ultrasound imaging with robotic aperture extension**, Haichong K. Zhang, Kyoto Univ. Graduate School of Medicine (Japan); Ezgi Ergun, Johns Hopkins Univ. (USA); Gregg E. Trahey, Duke Univ. (USA); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . . . . . [9419-20]

5:10 pm: **Wireless communication of real-time ultrasound data and control**, Richard J. Tobias, Cephasonics (USA) . . . . . [9419-21]

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SUNDAY 22 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

SESSION 4 (CONTINUED)
Room: Crystal C . . . . Sun 3:30 pm to 5:30 pm

4:50 pm: **Small animal functional lung imaging via parametric x-ray phase-contrast imaging**, Alfred B. Garson III, Washington Univ. in St. Louis (USA); Sunil Vasireddi, MetroHealth Medical Ctr., Case Western Reserve Univ. (USA) and Washington Univ. in St. Louis (USA); Sean Gunsten, Mallinckrodt Institute of Radiology, Washington Univ. in St. Louis (USA); Huifeng Guan, Steven L. Brody, Washington Univ. in St. Louis (USA); Mark A. Anastasio, Washington Univ. in St. Louis (USA) and Mallinckrodt Institute of Radiology (USA) . . . . . [9412-20]

5:10 pm: **Enabling lower dose scans by redefining the lower statistical limit in X-ray phase-contrast computed tomography**, Mathias Marschner, Michael Chabior, Andreas Fehringer, Peter B. Noël, Franz Pfeiffer, Technische Univ. München (Germany) . . . . . [9412-21]

WORKSHOP

Uncertainties in the Medical Imaging Chain

Room: Crystal C · Sun 5:45 to 7:45 pm

Workshop Chairs:
Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany), Otto-von-Guericke Univ. Magdeburg (Germany)
Despina Kontos, The Univ. of Pennsylvania Health System (USA)
Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona (USA)

See Special Events for additional information.

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CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

SESSION 4 (CONTINUED)
Room: Crystal D . . . . Sun 3:30 pm to 5:30 pm

4:50 pm: **Signal enhancement ratio (SER) quantified from breast DCE-MRI and breast cancer risk**, Shandong Wu, Univ. of Pittsburgh School of Medicine (USA); Brenda F. Kurland, Univ. of Pittsburgh (USA); Wendie A. Berg, Margarita L. Zuley, Univ. of Pittsburgh School of Medicine (USA) and Magee-Womens Hospital (USA); Rachel C. Jankowitz, Univ. of Pittsburgh School of Medicine (USA) and Magee-Womens Hospital (USA); Jules Sumkin, Univ. of Pittsburgh School of Medicine (USA) and Magee-Womens Hospital (USA); David Gur, Univ. of Pittsburgh School of Medicine (USA) . . . . . [9414-21]

5:10 pm: **A comparative analysis of 2D and 3D CAD for calcifications in digital breast tomosynthesis**, Raymond J. Acciavatti, The Univ. of Pennsylvania Health System (USA); Shonket Ray, Univ. of Pennsylvania (USA); Brad M. Keller, Univ. of Pennsylvania School of Medicine (USA); Andrew D. A. Maidment, Emily F. Conant, The Univ. of Pennsylvania Health System (USA) . . . . . [9414-22]

5:20 pm: **A superpixel-based framework for automatic tumor segmentation on breast DCE-MRI**, Ning Yu, The Univ. of Pennsylvania Health System (USA); Jia Wu, Univ. of Pennsylvania (USA); Susan P. Weinstein, The Univ. of Pennsylvania Health System (USA); Bilwaj K. Gaonkar, Univ. of Pennsylvania (USA); Brad M. Keller, Univ. of Pennsylvania School of Medicine (USA); Ahmed B. Ashraf, The Univ. of Pennsylvania Health System (USA); YunQing Jiang, Univ. of Pennsylvania (USA); Christos A. Davatzikos, Emily F. Conant, Despina Kontos, The Univ. of Pennsylvania Health System (USA) . . . . . [9414-23]

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: Oceans 4

WORKSHOP

Novel Robots for Less Invasive Surgery

Room: Oceans 4 · Sun 5:45 pm to 7:45 pm

Workshop Chair:
Robert J. Webster, III, Vanderbilt Univ. (USA)

See Special Events for additional information.

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CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations

Rooms: Crystal E

WORKSHOP

Radiology for the Non-Radiologist

Room: Crystal E · Sun 5:45 pm to 7:45 pm

Workshop Chair:
Jianguo Zhang, Shanghai Institute of Technical Physics (China)

See Special Events for additional information.

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CONFERENCE 9419
Ultrasonic Imaging and Tomography

Room: Oceans 2

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SUNDAY/MONDAY POSTERS

Location: Oceans Ballroom

Posters will be on display Sunday and Monday with extended viewing until 9:00 pm on Sunday. The interactive poster session with authors in attendance will be Monday 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 Sunday for extended viewing and consideration for a poster award.
- Poster boards will be available at 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 9412

Physics of Medical Imaging

NSECT sinogram sampling optimization by normalized mutual information, Rodrigo S. Viana, Univ. de São Paulo (Brazil); Miguel A Galarreta-Valverde, University of São Paulo (Brazil); Choukri Mekkaoui, Harvard Medical School (USA) and Massachusetts General Hospital (USA); Hélio Yoriyaz, Marcel P. Jackowski II, Univ. of São Paulo (Brazil) . . . . [9412-80]

Feasibility study of dose reduction in digital breast tomosynthesis using non-local denoising algorithms, Marcelo A. C. Vieira, Polyana F. Nunes, Helder C. R. Oliveira, Lucas R. Borges, Univ. de São Paulo (Brazil); Predrag R. Bakic, Raymond J. Acciavatti, The Univ. of Pennsylvania Health System (USA); Bruno Barufaldi, Univ. de São Paulo (Brazil); Andrew D. A. Maidment, The Univ. of Pennsylvania Health System (USA) . . . . . [9412-81]

Virtual clinical trials using inserted pathology in clinical images: investigation of assumptions for local glandularity and noise, Alaleh Rashidnasab, Univ. of Surrey (UK) and KU Leuven (Belgium); Premkumar Elangovan, Univ. of Surrey (UK); David R. Dance, Univ. of Surrey (UK) and NCCPM, The Royal Surrey County Hospital NHS Trust (UK); Kenneth C. Young, NCCPM, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Kevin Wells, Univ. of Surrey (UK) . . . . . [9412-82]

Region of interest processing for iterative reconstruction in x-ray computed tomography, Felix K. Kopp, Radin A. Nasirudin, Kai Mei, Andreas Fehringer, Franz Pfeiffer, Ernst J. Rummeny, Peter B. Noël, Technische Univ. München (Germany) . . . . . [9412-83]

Improving low-dose cardiac CT images using 3D sparse representation based processing, Luyao Shi, Yang Chen, Limin Luo, Southeast Univ. (China); Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-84]

Towards medical electrical permittivity tomography using parallel plate capacitive sensor with moveable diaphragms, Seyyed Hesabgar, Western Univ. (Canada); Abbas Samani, Ravi Menon, David W. Holdsworth, Western Univ. (Canada) and Robarts Research Institute (Canada); Seyed R. Mousavi, Western Univ. (Canada) [9412-85]

Complete optical stack modeling for CMOS-based medical x-ray detectors, Alexander S. Zyazin, Inge M. Peters, Teledyne DALSA (Netherlands) . . [9412-87]

Incorporating corrections for the head-holder and compensation filter when calculating skin dose during fluoroscopically-guided interventions, Sarath Vijayan, Vijay K. Rana, Stephen Rudin, Daniel R. Bednarek, Toshiba Stroke and Vascular Research Ctr. (USA)[9412-88]

An attempt to estimate out-of-plane lung nodule elongation in tomosynthesis images, Artur Chodorowski, Chalmers Univ. of Technology (Sweden) and Medtech West, Sahlgrenska Univ. Hospital, Gothenburg (Sweden); Jonathan Arvidsson, Christina Söderman, Angelica Svalkvist, Ase A. Johnsson, Magnus Båth, Sahlgrenska Univ. Hospital (Sweden). . . . . [9412-89]

A wire scanning based method for geometric calibration of high resolution CT system, Ruijie Jiang, Guang Li, Ning Gu, Gong Chen, Shouhua Luo, Southeast Univ. (China) . . . . . [9412-90]

Reduction of iodinated contrast medium in CT: feasibility study, Radin A. Nasirudin, Kai Mei, Technische Univ. München (Germany); Felix K. Kopp, Technische Univ. München (Germany); Ernst J. Rummeny, Peter B. Noël, Technische Univ. München (Germany) . . . . . [9412-91]

Parallel and accelerated computing method based on echo-memory GPGPU for virtual MRI scanning, Bin Kuang, Nini Rao, Dingyun Liu, Yongli Wan, Univ. of Electronic Science and Technology of China (China); Chaoming He, Siemens Shenzhen Magnetic Resonance Ltd. (China) . . . . . [9412-92]

Physics-based modeling of computed tomography systems, Hanbeen Youn, Ho Kyung Kim, Soohwa Kam, Seung Ho Kim, Ji Woong Park, Hosang Jeon, Pusan National Univ. (Korea, Republic of). . . . . [9412-93]

A novel CT-FFR method for the coronary artery based on 4D-CT image analysis and structural and fluid analysis, Kenji Hirohata, Akira Kano, Akihiro Goryu, Junichiro Ooga, Takuya Hongo, Shinya Higashi, Toshiba Corp. (Japan); Yasuko Fujisawa, Satoshi Wakai, Kazumasa Arakita, Yoshihiro Ikeda, Shigeo Kaminaga, Toshiba Medical Systems Corp. (Japan); Brian S. Ko, Sujith K. Seneviratne, Monash Cardiovascular Research Ctr., Monash Univ. (Australia) . . . . . [9412-94]

NVIDIA OptiX ray-tracing engine as a new tool for modelling medical imaging systems, Krzysztof Kacperski, Jakub Pietrzak, Marek Cie?lar, Institute of Maria Sklodowska-Curie (Poland) . . . . . [9412-95]

Feasibility of ray- and pixel-driven projector/back-projector in linear motion tomosynthesis, Sung-Hoon Choi, Hee-Joung Kim, Seung-Wan Lee, Young-Jin Lee, Ye-Seul Kim, Haeng-Hwa Lee, Yonsei Univ. (Korea, Republic of). [9412-96]

PET image reconstruction based on median nonlocal means induced prior incorporating anatomical side information, Qingfeng Hou, Taishan Medical Univ. (China); Jianhua Ma, Wufan Chen, Southern Medical Univ. (China) . . . . . [9412-98]

A rapid parallelization of cone-beam projection and back-projection operator based on texture fetching, Lizhe Xie, School of Stomatology, Nanjing Medical Univ. (China); Yining Hu, Yang Chen, Southeast Univ. (China) and Key Lab. of Computer Network and Information Integration, Ministry of Education of China (China) and Ctr. de Recherche en Information Biomedicale Sino-Francais (France); Luyao Shi, Southeast Univ. (China); Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-99]

Using digital subtraction in computer simulated images as a tool to aid the visual detection of masked lesions in dense breasts, Homero Schiabel, Luciana T. Guimaraes, Maria Angelica Z. Sousa, Univ. de São Paulo (Brazil) . . . . . [9412-100]

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Automatic detection and segmentation of vascular structures in dermoscopy images using a novel vesselness measure based on pixel redness and tubularness, Pegah Kharazmi, Harvey Lui, The Univ. of British Columbia (Canada); William Van Stoecker, Missouri Univ. of Science and Technology (USA); Tim K. Lee, The Univ. of British Columia (Canada) and The BC Cancer Agency Research Ctr. (Canada) . . . . . [9414-130]

Investigation of optimal feature value set in false positive reduction process for automated abdominal lymph node detection method, Yoshihiko Nakamura, Yukitaka Nimura, Nagoya Univ. (Japan); Takayuki Kitasaka, Shinji Mizuno, Aichi Institute of Technology (Japan); Kazuhiro Furukawa, Hidemi Goto, Michitaka Fujiwara, Nagoya Univ. Graduate School of Medicine (Japan); Kazunari Misawa, Aichi Cancer Ctr. Research Institute (Japan); Masaaki Ito, National Cancer Ctr. Hospital East (Japan); Shigeru Nawano, International Univ. of Health and Welfare (Japan); Kensaku Mori, Nagoya Univ. (Japan). . . . . [9414-131]

A pilot study on bladder wall thickness at different filling stages, Xi Zhang, Yang Liu, Baojuan Li, Guopeng Zhang, Fourth Military Medical Univ. (China); Zhengrong Liang, State Univ. of New York at Stony Brook (USA); Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . [9414-132]

CONFERENCE 9415

Image-Guided Procedures, Robotic Interventions, and Modeling

Medical image segmentation using object atlas versus object cloud models, Renzo Phellan, Alexandre X. Falcão, Univ. Estadual de Campinas (Brazil); Jayaram K. Udupa, Univ. of Pennsylvania (USA) . . . . . [9415-56]

Interactive non-uniformity correction and intensity standardization of MR images, Yubing Tong, Jayaram K. Udupa, Dewey Odhner, Shobhit Sharma, Drew A. Torigian, Univ. of Pennsylvania (USA). . . . . [9415-57]

Evaluation of input devices for teleoperation of concentric tube continuum robots for surgical tasks, Carolin Fellmann, Daryoush Kashi, Jessica Burgner-Kahrs, Leibniz Univ. Hannover (Germany) . . . . . [9415-58]

Additive manufacturing of patient-specific tubular continuum manipulators, Ernar Amanov, Thien-Dang Nguyen, Jessica Burgner-Kahrs, Leibniz Univ. Hannover (Germany) . . . . . [9415-59]

Towards the development of a spring-based continuum robot for neurosurgery, Yeongjin Kim, Shing Shin Cheng, Jaydev P. Desai, Univ. of Maryland, College Park (USA) . . . . . [9415-60]

Reconstruction of surfaces from planar contours through contour interpolation, Kyle R. Sunderland, Queen's Univ. (Canada); Boyeong Woo, Csaba Pinter, Gabor Fichtinger, Queen's Univ. (Canada) . . . . . [9415-61]

Intraoperative on-the-fly organ-mosaicking for laparoscopic surgery, Sebastian Bodenstedt, Daniel Reichard, Stefan Suwelack, Karlsruher Institut für Technologie (Germany); Martin Wagner, Hannes Kenngott, Beat Peter Müller-Stich, Ruprecht-Karls-Univ. Heidelberg (Germany); Rüdiger Dillmann, Stefanie Speidel, Karlsruher Institut für Technologie (Germany) . . . . . [9415-62]

Application of single-image camera calibration for ultrasound augmented laparoscopic visualization, Xinyang Liu, Children's National Health System (USA); He Su, Children's National Health System (USA) and Tianjin Univ. (China); Sukryool Kang, Timothy D Kane, Raj Shekhar, Children's National Health System (USA) . . . . . [9415-63]

Towards real-time remote processing of laparoscopic video, Zahra Ronaghi, Edward Duffy, David M. Kwartowitz, Clemson Univ. (USA) . . . . . [9415-64]

A novel method and workflow for stereotactic surgery with a mobile intraoperative CT imaging device, Senhu Li, Neal Clinthorne, Xoran Technologies, LLC (USA) . . . . . [9415-65]

Sparse reconstruction of liver cirrhosis from monocular mini-laparoscopic sequences, J. Marek Marcinczak, Sven Painer, Rolf-Rainer Grigat, Technische Univ. Hamburg-Harburg (Germany) . . . . . [9415-67]

Development and clinical application of surgical navigation system for laparoscopic hepatectomy, Yuichiro Hayashi, Tsuyoshi Igami, Tomoaki Hirose, Masato Nagino, Kensaku Mori, Nagoya Univ. (Japan) . . . . . [9415-68]

MR-TRUS registration based on subject-specific biomechanical model for image-guided prostate interventions, Xiaofeng Yang, Peter Rossi, Tomi Ogunleye, Ashesh Jani, Walter Curran, Tian Liu, Emory Univ. (USA) . . . . . [9415-69]

3D/2D image registration using weighted histogram of gradient directions, Soheil Ghafuriana, Ilker Hacihaliloglu, Dimitris N. Metaxas, Virak Tan, Kang Li, Rutgers, The State Univ. of New Jersey (USA). . . . . [9415-70]

A metric for evaluation of deformable image registration, Akihiro Takemura, Kanazawa Univ. (Japan); Hironori Kojima, Shinichi Ueda, Naoki Isomura, Kimiya Noto, Kanazawa Univ. Hospital (Japan); Tomohiro Ikeda, Kanazawa Univ (Japan). . . . . [9415-71]

An anatomically oriented breast model for MRI, Dominik Kutra, Martin Bergtholdt, Jöerg Sabczynski, Philips Research (Germany); Olaf Dössel, Karlsruher Institut für Technologie (Germany); Thomas Buelow, Philips Research (Germany) . . . . . [9415-72]

Surface-based registration of liver in ultrasound and CT, Ehsan Dehghan, KongKuo Lu, Pingkun Yan, Amir M. Tahmasebi, Philips Research North America (USA); Sheng Xu, Bradford J. Wood, Nadine Abi-Jaoudeh, Aradhana M. Venkatesan, National Institutes of Health (USA); Jochen Kruecker, Philips Research North America (USA) . . . . . [9415-73]

Model-based deformable registration of MRI breast images with enhanced feature selection, Shadi Emami Abarghouei, McMaster Univ. (Canada); Bahram Marami, Robarts Research Institute (Canada); Shahin Sirouspour, McMaster Univ. (Canada). . . . . [9415-74]

Smooth extrapolation of unknown anatomy via statistical shape models, Robert B. Grupp Jr., Hsin-Hong Chiang, Yoshito Otake, Ryan J. Murphy, Chad R. Gordon, Mehran Armand, Russell H. Taylor, Johns Hopkins Univ. (USA) . . . . . [9415-75]

Collision detection and modeling of rigid and deformable objects in laparoscopic simulator, Mary-Clare C. Dy, Ritsumeikan Univ. (Japan) and Shiga Univ. of Medical Science (Japan); Kazuyoshi Tagawa, Hiromi T. Tanaka, Ritsumeikan Univ. (Japan); Masaru Komori, Shiga Univ. of Medical Science (Japan). . . . . [9415-76]

Surgical instrument similarity metrics and tray analysis for multi-sensor instrument identification, Bernhard Glaser, Tobias Schellenberg, Stefan Franke, Stefan Dänzer, Thomas Neumuth, ICCAS Innovation Ctr. Computer Assisted Surgery (Germany) . . . . . [9415-77]

Which pivot calibration?, Ziv R. Yaniv, Children's National Health System (USA) . . . . . [9415-78]

A model-free method for annotating on vascular structure in volume rendered images, Wei He, Yanfang Li, Weili Shi, Yu Miao, Fei He, Fei Yan, Huamin Yang, Changchun Univ. of Science and Technology (China); Huimao ZHANG, The First Hospital of Jilin Univ. (China); Kensaku Mori, Nagoya Univ. (Japan); Zhengang Jiang, Changchun Univ. of Science and Technology (China) . . . . . [9415-79]

Line fiducial material and thickness considerations for ultrasound calibration, Golafsoun Ameri, A. Jonathan McLeod, John S. H. Baxter, Elvis C. S. Chen, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9415-80]

Live ultrasound volume reconstruction using scout scanning, Amelie Meyer, Lab. for Percutaneous Surgery (Canada) and Univ. de Strasbourg (France); Andras Lasso, Tamas Ungi, Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada) . . . . . [9415-81]

Benchmarking of state-of-the-art needle detection algorithms in 3D ultrasound data volumes, Arash Pourtaherian, Svitlana Zinger, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands); Hendrikus H. M. Korsten, Catharina-ziekenhuis (Netherlands) and Technische Univ. Eindhoven (Netherlands); Nenad Mihajlovic, Philips Research Nederland B.V. (Netherlands) . . . . [9415-82]

B-Mode ultrasound pose recovery via surgical fiducial segmentation and tracking, Alessandro Asoni, Michael Ketcha, Nathanael Kuo, Devin Coon, Jerry L. Prince, Lei Chen, Emad M Boctor, Johns Hopkins Univ. (USA) . . . . . [9415-84]

Validation of percutaneous puncture trajectory during renal access using 4D ultrasound reconstruction, Pedro L. Rodrigues, ICVS/3B's - PT Government Associate Lab. (Portugal) and Algoritmi Ctr., Univ. do Minho (Portugal) and DIGARC – Polytechnic Institute of Cávado and Ave (Portugal); Nuno F. Rodrigues, Algoritmi Ctr., School of Engineering, Univ. do Minho (Portugal) and DIGARC – Polytechnic Institute of Cávado and Ave (Portugal) and ICVS/3B's - PT Government Associate Lab. (Portugal); Jaime C. Fonseca, Algoritmi Ctr., School of Engineering, Univ. do Minho (Portugal); João L. Vilaça, DIGARC – Polytechnic Institute of Cávado and Ave (Portugal) and ICVS/3B's - PT Government Associate Lab. (Portugal) and Univ. do Minho (Portugal). . . . . [9415-85]

3D printed surface mould applicator for high-dose-rate brachytherapy, Mark W. Schumacher, Lab. for Percutaneous Surgery (Canada) and Queen's Univ. (Canada); Andras Lasso, Lab. for Percutaneous Surgery (Canada); Joshi Chandra, Conrad B. Falkson, L. John Schreiner, Kingston General Hospital (Canada); Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada) . [9415-86]

Method for evaluation of predictive models of microwave ablation via post-procedural clinical imaging, Jarrod A. Collins, Vanderbilt Univ. (USA); Dan Brown, Vanderbilt Univ. Medical Ctr. (USA); T. Peter Kingham, William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (USA); Michael I. Miga, Logan W. Clements, Vanderbilt Univ. (USA) . . . . . [9415-87]

Needle position estimation from sub-sampled k-space data for MRI-guided interventions, Sebastian Schmitt, Westfälische Hochschule (Germany); Morwan Choli, MR:comp GmbH (Germany); Heinrich-Martin Overhoff, Westfälische Hochschule (Germany) . . . . . [9415-88]

Intraoperative assessment and visualization of electromagnetic tracking error, Vinyas Harish, Tamas Ungi, Andras Lasso, Lab. for Percutaneous Surgery (Canada); Andrew MacDonald, Lab. for Percutaneous Surgery (Canada) and Queen's Univ. (Canada); Sulaiman Nanji, Queen's Univ. (Canada); Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada) . . . . . [9415-89]

Combining marker-less patient setup and respiratory motion monitoring using Kinect, Fatemeh Tahavori, Univ. of Surrey (UK); Elizabeth Adams, Marianne Dabbs, Tom Jordan, Royal Surrey County Hospital, NHS (UK); Phil Evans, Kevin Wells, Univ. of Surrey (UK) . . . . . [9415-90]

Quantification of intraventricular blood clot in MR-guided focused ultrasound surgery, Margaret A. Hess, Queen's Univ. (Canada) and The Hospital for Sick Children (SickKids) (Canada); Thomas Looi, The Hospital for Sick Children (SickKids) (Canada); Andras Lasso, Gabor Fichtinger, Queen's Univ. (Canada); James Drake, The Hospital for Sick Children (SickKids) (Canada) . . . . . [9415-91]

Targeting of deep-brain structures in nonhuman primates using MR and CT Images, Antong Chen, Catherine D. G. Hines, Belma Dogdas, Merck & Co., Inc. (USA); Ashely Bone, Kenneth Lodge, Stacey O'Malley, Brett Connolly, Christopher T. Winkelmann, Ansuman Bagchi, Laura S. Lubbers, Jason M. Uslaner, Colena Johnson, John Renger, Merck & Co Inc (USA); Hatim Zariwala, Merck & Co., Inc. (USA) . . . . . [9415-92]

Analysis of left atrial respiratory and cardiac motion for cardiac ablation therapy, Maryam E. Rettmann, David R. Holmes III, Susan B. Johnson, Helge I. Lehmann, Richard A. Robb, Douglas L. Packer, Mayo Clinic (USA) . . . . . [9415-93]

Register cardiac fiber orientations from 3D DTI volume to 2D ultrasound image of rat hearts, Xulei Qin, Silun Wang, Ming Shen, Xiaodong Zhang, Emory Univ. (USA); Stamatios Lerakis, Emory Univ (USA); Mary B. Wagner, Baowei Fei, Emory Univ. (USA) . . . . . [9415-94]

Simulated evaluation of an intraoperative surface modeling method for catheter ablation by a real phantom simulation experiment, Deyu Sun, Maryam E. Rettmann, Douglas L. Packer, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA); David R. Holmes III, Mayo Clinic (USA) . . . . . [9415-95]

CONFERENCE 9418

PACS and Imaging Informatics: Next Generation and Innovations

The standardization of super resolution optical microscopic images based on DICOM, Wei Xia, Xin Gao, Suzhou Institute of Biomedical Engineering and Technology (China) . . . . . [9418-18]

A web-based solution for 3D medical image visualization, Xiaoshuai Hou, Jianguo Zhang, Jianyong Sun, Shanghai Institute of Technical Physics (China) . . . . . [9418-33]

Imaging informatics system to support animal studies for treating pain in spinal cord injury utilizing proton radiotherapy, Sneha K. Verma, Brent J. Liu, The Univ. of Southern California (USA); Daila S. Gridley, Xiao W. Mao, Loma Linda Univ. (USA) . . . . . [9418-34]

Quantitative imaging features: extension of the oncology medical image database, Mishal N. Patel, Padraig T. Looney, Kenneth C. Young, Mark D. Halling-Brown, The Royal Surrey County Hospital NHS Trust (UK). . . . . [9418-35]

Open-source radiation exposure extraction engine (RE3) for dose monitoring, Samuel Weisenthal, Les R. Folio, Vana Derderian, Ronald M. Summers, Jianhua Yao, National Institutes of Health (USA) . . . . . [9418-36]

Teleradiology mobile internet system and home care medical system with a new information security solution, Hitoshi Satoh, Hi Sato, Tokai Gakuin Univ. (Japan). . . . . [9418-38]

Operation and evaluation of e-Science platform for translational biomedical imaging research, Tusheng Wang, Yuanyuan Yang, Mingqing Wang, Jianguo Zhang, Shanghai Institute of Technical Physics (China); Jianlin Liu, Shanghai Jiaotong Univ. (China). . . . . [9418-39]

DTI - DKI Fitting: a graphical toolbox for estimation and visualization of diffusion tensor and diffusion kurtosis imaging, Rajikha Raja, Neelam Sinha, International Institute of Information Technology, Bangalore (India); Jitender Saini, National Institute of Mental Health and Neuro Sciences (India) . . . . . [9418-41]

A novel image interpreting system for radiologists: tumor response monitoring through PACS, Mustafa Bayraktar, UALR (USA); Umit Topaloglu, James McDonald, Laura F. Hutchins, Univ. of Arkansas for Medical Sciences (USA) . . . . . [9418-42]

CONFERENCE 9419

Ultrasonic Imaging and Tomography

Research on respiratory motion correction method based on liver contrast-enhanced ultrasound images of single mode, Ji Zhang, Tao Li, Qiang Shi Zheng, Yong Yi Li, Wuhan General Hospital of Guangzhou Military Command (China) . . . . . [9419-37]

Time-frequency analysis of neonatal cranial ultrasonic movies for selective detection of pulsatile tissues by avoiding probe-motion artifact, Yuki Tabata, Masayuki Fukuzawa, Yusuke Izuwaki, Nobuyuki Nakamori, Kyoto Institute of Technology (Japan); Yoshiki Kitsunezuka, Saiseikai Hyogo-ken Hospital (Japan). . . . . [9419-38]

Ultrasound semi-automated measurement of fetal nuchal translucency thickness based on principal direction estimation, Heechul Yoon, Hyuntaek Lee, Hae-kyung Jung, Samsung Electronics Co., Ltd. (Korea, Republic of); Mi-Young Lee, Hye-Sung Won, Asan Medical Ctr. (Korea, Republic of) . . . . . [9419-39]

Breast cancer detection based on time reversal and the optical theorem, Edwin A. Marengo, Jing Tu, Northeastern Univ. (USA) . . . . . [9419-40]

Breast ultrasound tomography using both transmission and reflection data: initial clinical studies, Lianjie Huang, Youzuo Lin, Ting Chen, Junseob Shin, Miranda H. Intrator, Kenneth Hanson, Los Alamos National Lab. (USA); Katherine Epstein, Daniel Sandoval, Michael Williamson, The Univ. of New Mexico (USA) . . . . . [9419-41]

Ultrasound bent-ray tomography with a modified total-variation regularization scheme, Miranda H. Intrator, Los Alamos National Lab. (USA) and Univ. of Colorado Denver School of Medicine (USA); Youzuo Lin, Ting Chen, Junseob Shin, Lianjie Huang, Los Alamos National Lab. (USA) . . . . . [9419-42]

MONDAY 23 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

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

Algorithmic Developments
Session Chairs: **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Taly Gilat Schmidt,** Marquette Univ. (USA)

8:00 am: **Optimization and image quality assessment of the alpha-image reconstruction algorithm: iterative reconstruction with well-defined image quality metrics**, Sergej Lebedev, Stefan Sawall, Deutsches Krebsforschungszentrum (Germany); Stefan Kuchenbecker, Sebastian Faby, German Cancer Research Center (DKFZ) (Germany); Michael Knaup, Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) . . . . . [9412-22]

8:20 am: **An example-based brain MRI simulation framework**, Qing He, Henry M. Jackson Foundation for the Advancement of Military Medicine (USA); Snehashis Roy, Henry M. Jackson Foundation (USA); Amod Jog, Johns Hopkins Univ. (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA) . . . . . [9412-23]

8:40 am: **Motion estimation and compensation for coronary artery and myocardium in cardiac CT**, Qiulin Tang, Toshiba Medical Research Institute USA (USA); James Matthews, Marco Razeto, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Jesper J. Linde, Univ. of Copenhagen (Denmark); Satoru Nakanishi, Toshiba Medical Research Institute USA (USA) . . . . . [9412-24]

9:00 am: **Estimating ROI activity concentration with photon-processing and photon-counting SPECT systems**, Abhinav K. Jha, Eric C. Frey, Johns Hopkins Univ. (USA) . . . . . [9412-25]

9:20 am: **Monte Carlo simulation of inverse geometry x-ray fluoroscopy using a modified MC-GPU framework**, David A. P. Dunkerley, Michael T. Tomkowiak, Jordan M. Slagowski, Univ. of Wisconsin-Madison (USA); Bradley P. McCabe, The Univ. of Chicago (USA); Tobias Funk, Triple Ring Technologies, Inc. (USA); Michael A. Speidel, Univ. of Wisconsin-Madison (USA) . . . . . [9412-26]

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

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CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

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

Prostate and Colon I
Session Chairs: **Ronald M. Summers,** National Institutes of Health (USA); **Hiroyuki Yoshida,** Massachusetts General Hospital (USA)

8:00 am: **Connection method of separated luminal regions of intestine from CT volumes**, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazuhiro Furukawa, Osamu Watanabe, Takafumi Ando, Nagoya Univ. Graduate School of Medicine (Japan); Yoshiki Hirooka, Nagoya Univ. (Japan); Hidemi Goto, Nagoya Univ. Graduate School of Medicine (Japan); Kensaku Mori, Nagoya Univ. (Japan) . . . . . [9414-24]

8:20 am: **Electronic cleansing for dual-energy CT colonography based on material decomposition and virtual monochromatic imaging**, Rie Tachibana, Janne J. Näppi, Massachusetts General Hospital (USA); Se Hyung Kim, Seoul National Univ. Hospital (Korea, Republic of); Hiroyuki Yoshida, Massachusetts General Hospital (USA) . . . . . [9414-25]

8:40 am: **Distance weighted 'inside disc' classifier for computer-aided diagnosis of colonic polyps**, Yifan Hu, Stony Brook Univ. (USA); Bowen Song, Zhengrong Liang, Stony Brook Medicine (USA); Perry J. Pickhardt, Univ. of Wisconsin-Madison (USA) . [9414-26]

9:00 am: **Efficient Hilbert transform-based alternative to Tofts physiological models for representing MRI dynamic contrast-enhanced images in computer-aided diagnosis of prostate cancer**, Kevin M. Boehm, Shijun Wang, Karen E. Burtt, Baris Turkbey, Samuel Weisenthal, Peter A. Pinto, Peter L. Choyke, Bradford J. Wood, National Institutes of Health (USA); Nicholas A. Petrick, Berkman Sahiner, U.S. Food and Drug Administration (USA); Ronald M. Summers, National Institutes of Health (USA) . . . . . [9414-27]

9:20 am: **The evaluation of multi-structure, multi-atlas pelvic anatomy features in a prostate MR lymphography CAD system**, Midas Meijs, Oscar Debats, Henkjan Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands). . . . . [9414-28]

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

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 5
Room: Oceans 4 . . . . Mon 8:00 am to 9:40 am

Registration
Session Chairs: **Lena Maier-Hein,** Deutsches Krebsforschungszentrum (Germany); **Baowei Fei,** Emory Univ. (USA)

8:00 am: **Scaphoid fracture fixation: localization of bones through statistical model to ultrasound registration**, Emran Mohammad Abu Anas, Abtin Rasoulian, The Univ. of British Columbia (Canada); Paul St. John, David R. Pichora, Kingston General Hospital (Canada); Parvin Mousavi, Queen's Univ. (Canada); Victoria A. Lessoway, BC Women's Hospital and Health Ctr. (Canada); Alexander Seitel, The Univ. of British Columbia (Canada); Ilker Hacihaliloglu, Rutgers, The State Univ. of New Jersey (USA); Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada). . . . . [9415-23]

8:20 am: **Comparison of optimization strategy and similarity metric in atlas-to-subject registration using statistical deformation model**, Yoshito Otake, Nara Institute of Science and Technology (Japan); Ryan J. Murphy, Johns Hopkins Univ. Applied Physics Lab., LLC (USA); Robert B. Grupp Jr., Johns Hopkins Univ. (USA); Yoshinobu Sato, Nara Institute of Science and Technology (Japan); Russell H. Taylor, Johns Hopkins Univ. (USA); Mehran Armand, Johns Hopkins Univ. Applied Physics Lab., LLC (USA). [9415-24]

8:40 am: **Incorporating target registration error into path planning**, Michael Siebold, Neal Dillon, Robert J. Webster III, J. Michael Fitzpatrick, Vanderbilt Univ. (USA) . . . . . [9415-25]

9:00 am: **Adaptive deformable image registration of inhomogeneous tissues**, Jing Ren, Univ. of Ontario Institute of Technology (Canada) . . . . . [9415-26]

9:20 am: **Validation of model-based deformation correction in image-guided liver surgery via tracked intraoperative ultrasound: preliminary method and results**, Logan W. Clements, Jarrod A. Collins, Vanderbilt Univ. (USA); Amber L. Simpson, Memorial Sloan-Kettering Cancer Ctr. (USA); Yifei Wu, Vanderbilt Univ. (USA); William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (USA); Michael I. Miga, Vanderbilt Univ. (USA) . . . [9415-27]

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

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CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations
Rooms: Crystal E

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

Information Management, Systems Integration and Standards
Session Chair: **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China)

8:00 am: **Future trends in picture archiving and communication system (PACS)**, Mona M. Alhajeri, Malcolm Clarke, Brunel Univ. (UK) . . . . . [9418-43]

8:20 am: **DICOM index tracker enterprise: advanced system for enterprise-wide quality assurance and patient safety monitoring**, Min Zhang, Mayo Clinic Arizona (USA) and Arizona State Univ. (USA); William Pavlicek, Anshuman Panda, Mayo Clinic Arizona (USA); Steve G. Langer, Richard G. Morin, Kenneth A. Fetterly, Mayo Clinic (USA); Robert Paden, Mayo Clinic Arizona (USA); James Hanson, Arizona State Univ. (USA); Lin-Wei Wu, Mayo Clinic (USA); Teresa Wu, Arizona State Univ. (USA). . . . . [9418-19]

8:40 am: **Design challenges and gaps in standards in developing an interoperable zero footprint DI thin client for use in image-enabled electronic health record solutions**, Arun Agrawal, Mohawk College (Canada); David Koff, McMaster Univ. (Canada); Peter Bak, AXON Medical Technologies Corp. (Canada); Duane Bender, Mohawk College (Canada); Jane Castelli, McMaster Univ. (Canada) . . . . . [9418-20]

9:00 am: **Investigation into the need for ingesting foreign imaging exams into local systems and evaluation of the design challenges of Foreign Exam Management (FEM)**, Lazar Milovanovic, McMaster Univ. (Canada); Arun Agarawal, Mohawk College (Canada); Peter Bak, AXON Medical Technologies Corp. (Canada) and McMaster Univ. (Canada); Duane Bender, Mohawk College (Canada); David Koff, Hamilton Health Sciences (Canada) and McMaster Univ. (Canada) . . . . . [9418-21]

9:20 am: **Evaluation of DICOM viewer software for workflow integration in clinical trials**, Daniel Haak, Klaus Kabino, Thomas M. Deserno, RWTH Aachen Univ. (Germany) . . . . . [9418-22]

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

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CONFERENCE 9419
Ultrasonic Imaging and Tomography
Room: Oceans 2

SESSION 5
Room: Oceans 2 . . . . Mon 8:00 am to 9:40 am

Ultrasound Computer Tomography II
Session Chair: **Neb Duric,** Delphinus Medical Technologies (USA)

8:00 am: **Dual robotic arm ultrasound tomography: system setup and preliminary tomographic reconstruction**, Fereshteh Aalamifar, Dengrong Jiang, Haichong K. Zhang, Alexis Cheng, Xiaoyu Guo, Rishabh Khurana, Iulian I. Iordachita, Johns Hopkins Univ. (USA); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . . . . . [9419-22]

8:20 am: **Preliminary work on the construction of 3D ultrasound computer tomography system**, Xu Li, Huazhong Univ. of Science and Technology (China) . . . . . [9419-23]

8:40 am: **Transducer elements position calibration in a ring array USCT system**, Satoshi Tamano, Tohoku Univ. (Japan); Takashi Azuma, Haruka Imoto, Shu Takagi, The Univ. of Tokyo (Japan); Shin-ichiro Umemura, Tohoku Univ. (Japan); Yoichiro Matsumoto, The Univ. of Tokyo (Japan). . . . . [9419-24]

9:00 am: **Registration of 3D ultrasound computer tomography and MRI for evaluation of tissue correspondences**, Torsten Hopp, Robin Dapp, Michael Zapf, Ernst Kretzek, Hartmut E. Gemmeke, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany). . . . . [9419-25]

9:20 am: **Comparison of breast density measurements made using ultrasound tomography and mammography**, Mark A. Sak, Karmanos Cancer Institute (USA); Neb Duric, Peter J. Littrup, Karmanos Cancer Institute (USA) and Delphinus Medical Technologies (USA); Lisa Bey-Knight, Mark Krycia, Karmanos Cancer Institute (USA); Mark E. Sherman, National Cancer Institute (USA); Michael Boone, Alexandra Ethier, Delphinus Medical Technologies (USA); Norman F. Boyd, Princess Margaret Hospital (Canada); Gretchen Gierach, National Cancer Institute (USA) . . [9419-26]

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

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MONDAY 23 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 6
Room: Crystal C . . Mon 10:10 am to 12:10 pm

Computed Tomography I

Session Chairs: **Rebecca Fahrig,** Stanford School of Medicine (USA); **Thomas G. Flohr,** Siemens AG (Germany)

10:10 am: **Image-based material decomposition with a general volume constraint for photon-counting CT**, Zhoubo Li, Shuai Leng, Lifeng Yu, Cynthia H. McCollough, Mayo Clinic (USA)[9412-27]

10:30 am: **Fluence feld modulated CT on a clinical tomotherapy radiation therapy machine**, Timothy P. Szczykutowicz, James R. Hermus, Univ. of Wisconsin-Madison (USA) . . . . . [9412-28]

10:50 am: **Dual-energy imaging of bone marrow edema on a dedicated multi-source cone-beam CT system for the extremities**, Wojciech Zbijewski, Alejandro Sisniega, Joseph W. Stayman, Gaurav Thawait, Johns Hopkins Univ. (USA); Nathan Packard, John Yorkston, Carestream Health, Inc. (USA); Shadpour Demehri, Jan Fritz, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9412-29]

11:10 am: **Initial results from a prototype whole-body photon-counting computed tomography system**, Zhicong Yu, Shuai Leng, Steven M. Jorgensen, Zhoubo Li, Mayo Clinic (USA); Ralf Gutjahr, Siemens Medical Solutions (USA); Baiyu Chen, Mayo Clinic (USA); Xinhui Duan, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Ahmed Halaweish, Siemens Medical Solutions (USA); Lifeng Yu, Erik L. Ritman, Cynthia H. McCollough, Mayo Clinic (USA). . . . . [9412-30]

11:30 am: **Fluid dynamic bowtie attenuators**, Timothy P. Szczykutowicz, James R. Hermus, Univ. of Wisconsin-Madison (USA) . . . . . [9412-31]

11:50 am: **A new CT system architecture for high temporal resolution with applications to improved geometric dose efficiency and sparse sampling**, Guy M. Besson, ForeVision Technologies (USA) . . . . . [9412-32]

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

9412 continues on page 41

CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 6
Room: Crystal D . . Mon 10:10 am to 12:10 pm

Keynote and Novel Methods

Session Chairs: **Kenji Suzuki,** The Univ. of Chicago (USA); **Horst K. Hahn,** Fraunhofer MEVIS (Germany)

10:10 am: **Role of machine learning in clinical decision support** *(Keynote Presentation)*, Tanveer F. Syeda-Mahmood, IBM Research - Almaden (USA) . . . . . [9414-29]

11:10 am: **Deep learning with non-medical training used for chest pathology identification**, Yaniv Bar, Tel-Aviv Univ. (Israel); Idit Diamant, Lior Wolf, Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . [9414-30]

11:30 am: **Texture classification of anatomical structures in CT using a context-free machine learning approach**, Oscar A. Jiménez del Toro, HES-SO Valais (Switzerland) and Univ. de Genève (Switzerland); Antonio Foncubierta Rodríguez, HES-SO Valais (Switzerland); Adrien Depeursinge, Henning Müller, HES-SO Valais (Switzerland) and Univ. de Genève (Switzerland) . . . . . [9414-31]

11:50 am: **Multi-test cervical cancer diagnosis with missing data estimation**, Tao Xu, Xiaolei Huang, Lehigh Univ. (USA); Edward Kim, Villanova Univ. (USA); L. Rodney Long, Sameer K. Antani, National Library of Medicine (USA) . . . . . [9414-32]

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

9414 continues on page 41

CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 6
Room: Oceans 4 . . Mon 10:10 am to 12:10 pm

Ultrasound Image Guidance

Joint Session with Conference 9419

Session Chairs: **Cristian A. Linte,** Rochester Institute of Technology (USA); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands)

10:10 am: **Respiration induced fiducial motion tracking in ultrasound using an extended SFA approach**, Kunlin Cao, GE Global Research (USA); Bryan Bednarz, Univ. of Wisconsin School of Medicine and Public Health (USA); L. Scott Smith, Thomas K. F. Foo, Kedar A. Patwardhan, GE Global Research (USA). . . . . [9419-27]

10:30 am: **Needle detection in ultrasound using the spectral properties of the displacement field: a feasibility study**, Parmida Beigi, Tim E. Salcudean, Robert N. Rohling, The Univ. of British Columbia (Canada); Victoria A. Lessoway, BC Women's Hospital and Health Ctr. (Canada); Gary C. Ng, Philips Healthcare (USA) . . . . . [9415-28]

10:50 am: **A-scan ultrasound system for real-time puncture safety assessment during percutaneous nephrolithotomy**, Pedro L. Rodrigues, ICVS/3B's (Portugal) and Univ. do Minho (Portugal) and Instituto Politécnico do Cávado e do Ave (Portugal); Nuno F. Rodrigues, Univ. do Minho (Portugal) and Instituto Politécnico do Cávado (Portugal) and ICVS/3B's (Portugal); Jaime C. Fonseca, Univ. do Minho (Portugal); Marco A. von Krüger, Wagner C. A. Pereira, Univ. Federal of Rio de Janeiro (Brazil); João L. Vilaça, Politécnico do Cávado e do Ave (Portugal) and ICVS/3B's (Portugal) . . . . . [9419-28]

11:10 am: **Initial assessment of a freehand 3D intra-abdominal US probe**, Kevin C. Bren, Mayo Clinic (USA); Brian J. Davis, Richard A. Robb, Mayo Clinic College of Medicine (USA); David R. Holmes III, Mayo Clinic (USA) . . . [9415-29]

11:30 am: **Surveillance of hemodialysis vascular access with ultrasound vector flow imaging**, Andreas H. Brandt, Rigshospitalet (Denmark); Jacob B. Olesen, Technical Univ. of Denmark (Denmark); Kristoffer L. Hansen, Marianne Rix, Copenhagen Univ. Hospital Rigshopitalet (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark); Michael B. Nielsen, Copenhagen Univ. Hospital Rigshopitalet (Denmark). . . . . [9419-29]

11:50 am: **Active point out-of-plane ultrasound calibration**, Alexis Cheng, Xiaoyu Guo, Haichong Zhang, Hyun Jae Kang, Ralph Etienne-Cummings, Emad M. Boctor, Johns Hopkins Univ. (USA). [9415-30]

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

9415 continues on page 41

CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations
Rooms: Crystal E

SESSION 6
Room: Crystal E . . Mon 10:10 am to 11:50 am

Quantitative Analysis, Data Mining and Image-Based Patient-Specific Data Modeling

Session Chair: **Heinz U. Lemke,** Computer Assisted Radiology and Surgery (Germany)

10:10 am: **Extraction of endoscopic images for biomedical figure classification**, Zhiyun Xue, Daekeun You, Suchet K. Chachra, Sameer K. Antani, L. Rodney Long, Dina Demner-Fushman, George R. Thoma, National Library of Medicine (USA) . . . . . [9418-23]

10:30 am: **Lung boundary detection in pediatric chest x-rays**, Sema Candemir, Sameer K. Antani, Stefan R. Jaeger, Lister Hill National Ctr. for Biomedical Communications (USA); Renee Browning, National Institute of Allergy and Infectious Diseases (USA); George R. Thoma, Lister Hill National Ctr. for Biomedical Communications (USA) . . . . . [9418-24]

10:50 am: **Sampling probability distributions of lesions in mammograms**, Padraig T. Looney, Lucy M. Warren, The Royal Surrey County Hospital NHS Trust (UK); David R. Dance, Royal Surrey County Hospital NHS Trust (UK); Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK) . . . . . [9418-25]

11:10 am: **Medical case-based retrieval: integrating query MeSH terms for query-adaptive multi-modal fusion**, Alba García Seco de Herrera, Antonio Foncubierta Rodríguez, Henning Mueller, HES-SO Valais (Switzerland) . . . . . [9418-26]

11:30 am: **Clinical evaluation of using semantic searching engine for radiological imaging services in RIS-integrated PACS**, Tonghui Ling, Kai Zhang, Yuanyuan Yang, Shanghai Institute of Technical Physics (China); Yanqing Hua, HuaDong Hospital (China); Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . . [9418-27]

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

9418 continues on page 41

CONFERENCE 9419
Ultrasonic Imaging and Tomography
Room: Oceans 4

SESSION 6
Room: Oceans 4 . . Mon 10:10 am to 12:10 pm
NOTE ROOM CHANGE

Ultrasound Image Guidance

Joint Session with Conference 9415

Session Chairs: **Cristian A. Linte,** Rochester Institute of Technology (USA); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands)

10:10 am: **Respiration induced fiducial motion tracking in ultrasound using an extended SFA approach**, Kunlin Cao, GE Global Research (USA); Bryan Bednarz, Univ. of Wisconsin School of Medicine and Public Health (USA); L. Scott Smith, Thomas K. F. Foo, Kedar A. Patwardhan, GE Global Research (USA). . . . . [9419-27]

10:30 am: **Needle detection in ultrasound using the spectral properties of the displacement field: a feasibility study**, Parmida Beigi, Tim E. Salcudean, Robert N. Rohling, The Univ. of British Columbia (Canada); Victoria A. Lessoway, BC Women's Hospital and Health Ctr. (Canada); Gary C. Ng, Philips Healthcare (USA) . . . . . [9415-28]

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11:50 am: **Active point out-of-plane ultrasound calibration**, Alexis Cheng, Xiaoyu Guo, Haichong Zhang, Hyun Jae Kang, Ralph Etienne-Cummings, Emad M. Boctor, Johns Hopkins Univ. (USA). [9415-30]

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

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MONDAY 23 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 7
Room: Crystal C . . . . Mon 1:20 pm to 3:40 pm

Photon Counting Imaging

Session Chairs: **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden)

1:20 pm: **Spectral CT of the extremities with a silicon strip photon counting detector**, Alejandro Sisniega, Wojciech Zbijewski, Joseph W. Stayman, Jennifer Xu, Dongjie Xie, Katsuyuki Taguchi, Johns Hopkins Univ. (USA); Erik Fredenberg, Mats Lundqvist, Philips Women's Heatlhcare (Sweden); Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9412-33]

1:40 pm: **Pulse detection logic for multibin photon counting detectors: beyond the simple comparator**, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9412-34]

2:00 pm: **Evaluation of spectral CT data acquisition methods via non-stochastic variance maps**, Adrian A. Sanchez, Emil Y. Sidky, The Univ. of Chicago Medical Ctr. (USA); Taly Gilat Schmidt, Marquette Univ. (USA); Xiaochuan Pan, The Univ. of Chicago Medical Ctr. (USA) . . . . . [9412-35]

2:20 pm: **Low rank approximation based noise reduction in spectral CT imaging using photon counting detector**, Yinsheng Li, Univ. of Wisconsin-Madison (USA); Jiang Hsieh, GE Healthcare (USA); Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-36]

2:40 pm: **Multivariate Gaussian model based Cramér-Rao lower bound evaluation of the in-depth PCXD**, Yuan Yao, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9412-37]

3:00 pm: **Energy calibration of photon counting detectors using x-ray tube potential as a reference for material decomposition applications**, Mini Das, Bigyan Kandel, Chan Soo Park, Zhihua Liang, Univ. of Houston (USA) . . . [9412-38]

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CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 7
Room: Crystal D . . . . Mon 1:20 pm to 3:40 pm

Head and Neck

Session Chairs: **Hayit Greenspan,** Tel Aviv Univ. (Israel); **Khan M. Iftekharuddin,** Old Dominion Univ. (USA)

1:20 pm: **Atlas-based segmentation of brainstem regions in neuromelanin-sensitive magnetic resonance images**, Marc Puigvert, Clínica Univ. de Navarra (Spain); Gabriel Castellanos, Javier Uranga, Univ. de Navarra (Spain); Ricardo Abad, Clínica Univ. de Navarra (Spain); María A. Fernández-Seara, Pablo Pastor, María A. Pastor, Arrate Muñoz-Barrutia, Carlos Ortiz de Solórzano, Univ. de Navarra (Spain) . . . . . [9414-33]

1:40 pm: **Automatic anatomy recognition in post-tonsillectomy MR images of obese children with OSAS**, Yubing Tong, Jayaram K. Udupa, Dewey Odhner, Univ. of Pennsylvania (USA); Sanghun Sin, Raanan Arens, Children's Hospital at Montefiore (USA) . . . . . [9414-34]

2:00 pm: **Multi-fractal detrended texture feature for brain tumor classification**, Syed M. S. Reza, Randall Mays, Khan M. Iftekharuddin, Old Dominion Univ. (USA) . . . . . [9414-35]

2:20 pm: **Small white matter lesion detection in cerebral small vessel disease**, Mohsen Ghafoorian, Radboud Univ. Nijmegen (Netherlands); Nico Karssemeijer, Radboud Univ. Nijmegen (Netherlands) and Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Inge van Uden, Donders Institute for Brain, Cognition and Behaviour, Radboud University Medical Center (Netherlands); Frank-Erik de Leeuw, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Tom Heskes, Radboud Univ. Nijmegen (Netherlands); Elena Marchiori, Radboud Univ. Jijmegen (Netherlands); Bram Platel, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9414-36]

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 7
Room: Oceans 4 . . . . Mon 1:20 pm to 3:40 pm

Tracking and Organ Motion Modeling

Session Chairs: **Andrew D. Wiles,** Northern Digital Inc. (Canada); **Ivo Wolf,** Hochschule Mannheim (Germany)

1:20 pm: **Calibration of a needle tracking device with fiber Bragg grating sensors**, Koushik Kanti Mandal, Francois Parent, Sylvain Martel, Raman Kashyap, Samuel Kadoury, Ecole Polytechnique de Montréal (Canada) . . . . . [9415-31]

1:40 pm: **Virtual rigid body: a new optical tracking paradigm in image guided interventions**, Alexis Cheng, David S. Lee, Nishikant Deshmukh, Emad M. Boctor, Johns Hopkins Univ. (USA) . . . . . [9415-32]

2:00 pm: **Integration of fiber optical shape sensing with medical visualization for minimal-invasive interventions**, Torben Paetz, Fraunhofer MEVIS (Germany); Christian Waltermann, Martin Angelmahr, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Darko Ojdanic, Fraunhofer MEVIS (Germany); Wolfgang Schade, Michael Witte, Fraunhofer-Institut für Nachrichtentechnik Heinrich-Hertz-Institut (Germany); Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . [9415-33]

2:20 pm: **4DCBCT-based motion modeling and 3D fluoroscopic image generation for lung cancer radiotherapy**, Salam Dhou, Martina Hurwitz, Brigham and Women's Hospital (USA) and Dana-Farber Cancer Institute (USA) and Harvard Medical School (USA); Pankaj Mishra, Varian Medical Systems, Inc. (USA); John Lewis, Brigham and Women's Hospital (USA) and Dana-Farber Cancer Institute (USA) and Harvard Medical School (USA). . . . . [9415-34]

2:40 pm: **Surgical tool detection and tracking in retinal microsurgery**, Mohamed S. Alsheakhali, Mehmet Yigitsoy, Abouzar Eslami, Nassir Navab, Technische Univ. München (Germany) . . . . . [9415-35]

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CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations
Rooms: Crystal E

SESSION 7
Room: Crystal E . . . . Mon 1:20 pm to 3:00 pm

Imaging Informatics for Diagnostic and Therapeutic Applications

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

1:20 pm: **A concept-based interactive biomedical image retrieval approach using visualness and spatial information**, Md Mahmudur Rahman, Sameer K. Antani, Dina Demner-Fushman, George R. Thoma, National Library of Medicine (USA) . . . . . [9418-28]

1:40 pm: **Mass classification in mammography with multi-agent based fusion of human and machine intelligence**, Dongdong Xi, Ming Fan, LiHua Li, Hangzhou Dianzi Univ. (China); Juan Zhang, Zhejiang Cancer Hospital (China); Yanna Shan, Hangzhou First People's Hospital (China); Gang Dai, Zhejiang Cancer Hospital (China); Bin Zheng, Univ. of Pittsburgh (USA) . [9418-29]

2:00 pm: **Association between dynamic features of breast DCE-MR imaging and clinical response of neoadjuvant chemotherapy: a preliminary analysis**, Lijuan Huang, Ming Fan, Lihua Li, Hangzhou Dianzi Univ. (China); Juan Zhang, Guoliang Shao, Zhejiang Cancer Hospital (China); Bin Zheng, Univ. of Pittsburgh (USA) . . . . . [9418-30]

2:20 pm: **Automated identification of retained surgical items in radiological images**, Gady Agam, Lin Gan, Illinois Institute of Technology (USA) and Rapid Medical Technologies (USA); Vicko Gluncic, Mario Moric, Rush Univ. Medical Ctr. (USA) and Rapid Medical Technologies (USA) . . . . . [9418-31]

2:40 pm: **Design and evaluation of an imaging informatics system for analytics-based decision support in radiation therapy**, Ruchi R. Deshpande, The Univ. of Southern California (USA); John J. DeMarco, Univ. of California, Los Angeles (USA); Brent J. Liu, The Univ. of Southern California (USA) . . . . . [9418-32]

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CONFERENCE 9419
Ultrasonic Imaging and Tomography
Room: Oceans 2

SESSION 7
Room: Oceans 2 . . . . Mon 1:20 pm to 3:40 pm

Ultrasound Image Analysis

Session Chair: **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands)

1:20 pm: **Quantification of cerebral ventricle volume change of preterm neonates using 3D ultrasound images**, Yimin Chen, City Univ. of Hong Kong (Hong Kong, China); Jessica Kishimoto, Wu Qiu, Robarts Research Institute (Canada); Sandrine de Ribaupierre, Western Univ. (Canada); Aaron Fenster, Robarts Research Institute (Canada); Bernard Chiu, City Univ. of Hong Kong (Hong Kong, China)[9419-30]

1:40 pm: **Quantitative ultrasound texture analysis for clinical decision making support**, Jie Ying Wu, Brown Univ. (USA); Michael Beland, Joseph Konrad, Rhode Island Hospital (USA); Adam Tuomi, David Glidden, Brown Univ. (USA); David J. Grand, Derek Merck, Rhode Island Hospital (USA) . . . . . [9419-31]

2:00 pm: **Classification of kidney and liver tissue using ultrasound backscatter data**, Fereshteh Aalamifar, Johns Hopkins Univ. (USA) and Children's National Health System (USA); Hassan Rivaz, McGill Univ. (Canada); Juan J. Cerrolaza, Children's National Medical Ctr. (USA); James Jago, Philips Healthcare, N.A. (USA); Nabile M. Safdar, Children's National Medical Ctr. (USA); Emad M. Boctor, Johns Hopkins Univ. (USA); Marius G. Linguraru, Children's National Medical Ctr. (USA) . . . . . [9419-32]

2:20 pm: **An integrated framework for spatio-temporal registration of intravascular ultrasound pullbacks**, Ling Zhang, The Univ. of Iowa (USA); Andreas Wahle, Zhi Chen, Richard Downe, The Univ. of Iowa (USA); John Lopez, Loyola Univ. (USA); Tomas Kovarnik, Charles Univ. (Czech Republic); Milan Sonka, Univ. of Iowa (USA) . . . . . [9419-33]

2:40 pm: **Iterative motion compensation approach for ultrasonic thermal imaging**, Ioana N. Fleming, Gregory D. Hager, Xiaoyu Guo, Hyun Jae Kang, Johns Hopkins Univ. (USA); Emad M. Boctor, Johns Hopkins Medical Institutions (USA) . . . . . [9419-34]

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MONDAY 23 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

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

3:20 pm: **Modelling the channel-wise count response of a photon-counting spectral CT detector to a broad x-ray spectrum**, Xuejin Liu, Han Chen, Hans Bornefalk, Mats E. Danielsson, Staffan Karlsson, Mats Persson, Cheng Xu, Ben Huber, KTH Royal Institute of Technology (Sweden) . . . . . [9412-39]

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

9412 continues on page 43

CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

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

2:40 pm: **Automated prediction of tissue outcome after acute ischemic stroke in computed tomography perfusion images**, Pieter C. Vos, Image Sciences Institute (Netherlands); Edwin Bennink, Hugo W. A. M. de Jong, Birgitta K. Velthuis, Max A. Viergever, Jan Willem Dankbaar, Univ. Medical Ctr. Utrecht (Netherlands). . . . . [9414-37]

3:00 pm: **Automated segmentation of thyroid gland on CT images with multi-atlas label fusion and random classification forest**, Jiamin Liu, Kevin Chang, Lauren Kim, Evrim B. Turkbey, Le Lu, Jianhua Yao, National Institutes of Health (USA) . . . . . [9414-38]

3:20 pm: **Detection of Alzheimer's disease using group lasso SVM-based region selection**, Zhuo Sun, Leiden Univ. Medical Ctr. (Netherlands); Yong Fan, Institute of Automation (China); Boudewijn P. F. Lelieveldt, Martijn van de Giessen, Leiden Univ. Medical Ctr. (Netherlands). . . . . [9414-39]

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

9414 continues on page 43

CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: Oceans 4

SESSION 7 (CONTINUED)
Room: Oceans 4 . . . . Mon 1:20 pm to 3:40 pm

3:00 pm: **A biomechanical approach for in vivo lung tumor motion prediction during external beam radiation therapy**, Elham Karami, Western Univ. (Canada) and Imaging Research Labs., Robarts Research Institute (Canada); Stewart Gaede, Western Univ. (Canada); Ting-Yim Lee, Lawson Health Research Institute (Canada) and Imaging Research Labs., Robarts Research Institute (Canada) and Western Univ. (Canada); Abbas Samani, The Univ. of Western Ontario (Canada) and Imaging Research Laboratories, Robarts Research Institute (Canada) and Western Univ. (Canada). . . . . [9415-36]

3:20 pm: **Can coffee improve image guidance?**, Raul Wirz, Ray A. Lathrop, Vanderbilt Univ. (USA); Jessica Burgner-Kahrs, Leibniz Univ. Hannover (Germany); Paul T. Russell III, Robert J. Webster III, Isuru Godage, Vanderbilt Univ. (USA) . . . . . [9415-37]

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

9415 continues on page 43

CONFERENCE 9418
PACS and Imaging Informatics: Next Generation and Innovations

Rooms: Crystal E

POSTER AWARDS SESSION
Room: Crystal E . . . . 3:00 pm to 3:05 pm

Poster Award Announcements

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

NOTE: TUESDAY WORKSHOP

TUESDAY WORKSHOP
Computing in Medical Imaging: The Future is in the Cloud

NOTE DAY

Room: Oceans 4 · Tue 5:00 pm to 7:00 pm

Workshop Chair:
Claudia Mello-Thoms,
The Univ. of Sydney (Australia),
Univ. of Pittsburgh (USA)

See Special Events for additional information.

CONFERENCE 9418 ENDS

CONFERENCE 9419
Ultrasonic Imaging and Tomography

Room: Oceans 2

SESSION 7 (CONTINUED)
Room: Oceans 2 . . . . Mon 1:20 pm to 3:40 pm

3:00 pm: **Extraction of four chamber synchronization information from ultrasound images by discrete shape optimization**, Yaonan Zhang, Northeastern Univ. (China) . . . . . [9419-35]

3:20 pm: **Parametric imaging of tumor perfusion and neovascular morphology using ultrasound**, Kenneth Hoyt, The Univ. of Alabama at Birmingham (USA) . . . . . [9419-36]

POSTER AWARDS SESSION
Room: Oceans 2 Mon. 3:40 pm to 3:45 pm

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

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

CONFERENCE 9419 ENDS

BEST STUDENT PAPER AWARD AND PLENARY PRESENTATION

Monday 23 February · 4:00 to 5:30 pm · Location: Crystal A-C

Conference Chairs: **Ehsan Samei,** Duke Univ. (USA)
David Manning, Lancaster Univ. (UK)

Student Paper Award Announcement
LUNGx Challenge Results Announced

Plenary Presentation:

4/5D imaging for guiding intracardiac and extracorporeal ablation of cardiac arrhythmias
Douglas L. Packer, Mayo Clinic (USA)

TUESDAY 24 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 8
Room: Crystal C . . . . . Tue 8:00 am to 9:40 am

Keynote and Novel Imaging Technologies
Session Chairs: **Guang-Hong Chen,** Univ. of Wisconsin-Madison (USA); **Christoph Hoeschen,** Otto-von-Guericke-Univ. Magdeburg (Germany), Otto-von-Guericke Univ. Magdeburg and Helmholtz Zentrum München GmbH (Germany)

8:00 am: **Quantitative imaging as a cancer biomarker** *(Keynote Presentation)*, David A. Mankoff, Hospital of the Univ. of Pennsylvania (USA) . . . . . [9412-40]

9:00 am: **Respiratory motion compensation for simultaneous PET/MR based on a 3D-2D registration of strongly undersampled radial MR data: a simulation study**, Christopher M. Rank, Thorsten Heusser, Barbara Flach, Marcus Brehm, Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) . . . . . [9412-41]

9:20 am: **Theoretical and experimental comparison of image signal and noise for dual-energy subtraction angiography and conventional x-ray angiography**, Christiane S. Burton, Ian A. Cunningham, Robarts Research Institute (Canada); John R. Mayo, Vancouver Coastal Health Research Institute (Canada) . . . . . [9412-42]

AWARDS SESSION
Room: Crystal C . . . . . Tue 9:40 am to 9:45 am

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

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

9412 continues on page 44

CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 1
Room: Crystal E . . . . . Tue 8:00 am to 9:40 am

Quantitative Image Analysis
Session Chairs: **David R. Haynor,** Univ. of Washington (USA); **Josien P. W. Pluim,** Technische Univ. Eindhoven (Netherlands)

8:00 am: **Highly accurate volumetry of the spinal cord**, Florian Weiler, Fraunhofer MEVIS (Germany); Marita Daams, Vrije Univ. Medical Ctr. (Netherlands); Carsten Lukas, St. Josefs-Hospital, Ruhr-Univ. Bochum (Germany); Frederik Barkhof, Vrije Univ. Medical Ctr. (Netherlands); Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . [9413-1]

8:20 am: **Constructing a statistical atlas of the radii of the optic nerve and cerebrospinal fluid sheath in young healthy adults**, Robert L. Harrigan, Andrew J. Plassard, Louise A. Mawn, Robert L. Galloway, Seth A. Smith, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9413-2]

8:40 am: **Adaptive sampling of CT data for myocardial blood flow estimation from dose-reduced dynamic CT**, Dimple Modgil, The Univ. of Chicago Medical Ctr. (USA); Michael D. Bindschadler, Adam M. Alessio, Univ. of Washington (USA); Patrick J. La Rivière, The Univ. of Chicago Medical Ctr. (USA) . . . . . [9413-3]

9:00 am: **Segmentation of vascular structures and hematopoietic cells in 3D microscopy images and quantitative analysis**, Jian Mu, Danny Ziyi Chen, Lin Yang, Univ. of Notre Dame (USA); Malgorzata M. Kamocka, Nadia Carlesso, Amy L. Zollman, Indiana Univ. School of Medicine (USA) . . . . . [9413-4]

9:20 am: **Fast left ventricle tracking in CMR images using localized anatomical affine optical flow**, Sandro Queirós, ICVS/3B's - PT Government Associate Lab., School of Health Sciences, Univ. do Minho (Portugal) and Lab. on Cardiovascular Imaging and Dynamics, Katholieke Univ. Leuven (Belgium); João L. Vilaça, ICVS/3B's - PT Government Associate Lab., School of Health Sciences, Univ. do Minho (Portugal) and DIGARC – Polytechnic Institute of Cávado and Ave (Portugal); Pedro Morais, ICVS/3B's - PT Government Associate Lab., School of Health Sciences, Univ. do Minho (Portugal); Jaime C. Fonseca, Univ. do Minho (Portugal); Jan D'hooge, Lab. on Cardiovascular Imaging and Dynamics, KU Leuven (Belgium); Daniel Barbosa, ICVS/3B's - PT Government Associate Lab., School of Health Sciences, Univ. do Minho (Portugal) and DIGARC – Polytechnic Institute of Cávado and Ave (Portugal) . . . . . [9413-5]

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

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CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 8
Room: Crystal D . . . . . Tue 8:00 am to 9:40 am

Breast II
Session Chairs: **Maryellen L. Giger,** The Univ. of Chicago (USA); **Susan M. Astley,** The Univ. of Manchester (UK)

8:00 am: **Identifying metastatic breast tumors using textural kinetic features of a contrast based habitat in DCE-MRI**, 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) . . . . . [9414-40]

8:20 am: **Association of mammographic image feature change and an increasing risk trend of developing breast cancer: an assessment**, Maxine Tan, The Univ. of Oklahoma (USA); Joseph K. Leader, Univ. of Pittsburgh (USA); Hong Liu, Bin Zheng, The Univ. of Oklahoma (USA). . . . . [9414-76]

8:40 am: **Local breast density as a predictor of breast cancer**, Mayu Otsuka, Univ. of Manchester Medical School (UK); Elaine F. Harkness, Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK) and Manchester Academic Health Science Ctr., The Univ. of Manchester (UK); Xin Chen, Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Manchester Academic Health Science Ctr. (UK); Emmanouil Moschidis, Ctr. for Imaging Sciences, Institute of Population Health, The Univ. of Manchester (UK) and Manchester Academic Health Science Ctr. (UK); Megan Bydder, Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester, NHS (UK); Soujanya Gadde, Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK); Yit Y. Lim, Ctr. for Imaging Sciences, Institute of Population Health, The Univ. of Manchester (UK) and Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK); Anthony J. Maxwell, Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK) and Manchester Breast Ctr., Manchester Cancer Research Ctr. (UK); Anthony Howell, Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK) and Manchester Breast Ctr., Manchester Cancer Research Ctr. (UK); Paula Stavrinos, Univ. Hospital of South Manchester (UK) and The Univ. of Manchester, Manchester Academic Health Science Centre (UK); Mary Wilson, Nightingale Ctr. and Genesis Prevention Ctr., Univ. Hospital of South Manchester (UK); Susan M. Astley, Ctr. for Imaging Sciences, The Univ. of Manchester (UK) and Univ. Hospital of South Manchester (UK) and Manchester Breast Ctr., Manchester Cancer Research Ctr., Christie Hospital (UK) . . . . . [9414-20]

9:00 am: **Digital breast tomosynthesis: application of 2D digital mammography CAD to detection of microcalcification clusters on planar projection image**, Ravi K. Samala, Heang-Ping Chan, Yao Lu, Lubomir M. Hadjiiski, Jun Wei, Mark A. Helvie, Univ. of Michigan (USA) . . . . . [9414-43]

CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 8
Room: Oceans 4 . . . . . Tue 8:00 am to 9:40 am

Segmentation
Session Chairs: **Alexandre X. Falcão,** Univ. Estadual de Campinas (Brazil); **David R. Haynor,** Univ. of Washington (USA)

8:00 am: **Deep learning for automatic localization, identification, and segmentation of vertebral bodies in volumetric MR images**, Amin Mahdi Suzani, Abtin Rasoulian, Alexander Seitel, Sidney Fels, Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . [9415-38]

8:20 am: **Grading remodeling severity in asthma based on airway wall thickening index and bronchoarterial ratio measured with MSCT**, Catalin Fetita, Télécom SudParis (France); Pierre-Yves Brillet, Univ. Paris 13 (France) and Assistance Publique Hopitaux de Paris (France); Christopher Brightling, Univ. of Leicester (UK) and Glenfield Hospital (UK); Philippe A. Grenier, Univ. Paris 6 (France) and Assistance Publique Hopitaux de Paris (France) . . . . . [9415-39]

8:40 am: **Evaluation metrics for bone segmentation in ultrasound**, Matthew Lougheed, Gabor Fichtinger, Tamas Ungi, Queen's Univ. (Canada) . . . . . [9415-40]

9:00 am: **Fast and intuitive segmentation of gyri of the human brain**, Florian Weiler, Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . [9415-41]

9:20 am: **Automatic anatomy recognition in PET/CT Images**, Huiqian Wang, Univ. of Pennsylvania (USA) and Chongqing Univ. (China); Jayaram K. Udupa, Univ. of Pennsylvania (USA); Dewey Odhner, Yubing Tong, The Univ. of Pennsylvania Health System (USA); Liming Zhao, Univ. of Pennsylvania (USA) and Chongqing Univ. (China); Drew A. Torigian, Hospital of the Univ. of Pennsylvania (USA) . . . . . [9415-42]

POSTER AWARDS SESSION
Room: Oceans 4 . . . . . 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 9:40 am to 10:10 am

9:20 am: **Combination of conspicuity improved synthetic mammograms and digital breast tomosynthesis: a promising approach for mass detection**, Seong Tae Kim, Dae Hoe Kim, Yong Man Ro, KAIST (Korea, Republic of) . . . . . [9414-44]

POSTER AWARDS SESSION
Room: Crystal D . . . . . 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 9:40 am to 10:10 am

9414/9415 continues on page 44

TUESDAY 24 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 9
Room: Crystal C . . . . . Tue 10:10 am to 12:10 pm

Measurements, Phantoms, Simulations
Session Chairs: **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA); **Robert M. Nishikawa,** Univ. of Pittsburgh (USA)

10:10 am: **A quantitative metrology for performance characterization of breast tomosynthesis systems based on an anthropomorphic phantom**, Lynda C. Ikejimba, Carl E. Ravin Advanced Imaging Labs., Duke Univ. (USA) and Duke Univ. Medical Ctr. (USA) and Medical Physics Graduate Program, Duke Univ. (USA); Yicheng Chen, Tsinghua Univ. (China) and Carl E. Ravin Advanced Imaging Labs., Duke Univ. (USA); Nadia Oberhofer, Azienda Sanitaria dell'AltoAdige (Italy); Nooshin Kiarashi, Carl E. Ravin Advanced Imaging Labs., Duke Univ. (USA) and Duke Univ. Medical Ctr. (USA); Joseph Y. Lo, Ehsan Samei, Carl E. Ravin Advanced Imaging Labs., Duke Univ. (USA) and Duke Univ. Medical Ctr. (USA) and Medical Physics Graduate Program, Duke Univ. (USA) . . . . . [9412-43]

10:30 am: **Volumetric limiting spatial resolution analysis of four dimensional digital subtraction angiography (4D-DSA)**, Brian J. Davis, Erick L. Oberstar, Univ. of Wisconsin-Madison (USA); Kevin L. Royalty, Siemens Medical Solutions USA, Inc. (USA) and Univ. of Wisconsin-Madison (USA); Sebastian Schafer, Siemens Medical Solutions USA, Inc. (USA); Charles M. Strother, Charles A. Mistretta, Univ. of Wisconsin-Madison (USA). . . . . [9412-44]

10:50 am: **New family of generalized metrics for comparative imaging system evaluation**, Megan K. Russ, Vivek Singh, Brendan M. Loughran, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) . . . . . [9412-45]

11:10 am: **Approximate path seeking for statistical iterative reconstruction**, Meng Wu, Stanford Univ. (USA); Qiao Yang, Andreas K. Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rebecca Fahrig, Stanford Univ. (USA) . . . . . [9412-46]

11:30 am: **Enhancing 4D PC-MRI in an aortic phantom considering numerical simulations**, Jonas Kratzke, Nicolai J. Schoch, Ruprecht-Karls-Univ. Heidelberg (Germany); Christian Weis, UniversitätsKlinikum Heidelberg (Germany); Matthias Müller-Eschner, UniversitätsKlinikum Heidelberg (Germany) and Deutsches Krebsforschungszentrum (Germany); Stefanie Speidel, Karlsruher Institut für Technologie (Germany); Mina Farag, Carsten J. Beller, UniversitätsKlinikum Heidelberg (Germany); Vincent Heuveline, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . [9412-47]

11:50 am: **Experimental implementation of coded aperture coherent scatter spectral imaging of cancerous and healthy breast tissue samples**, Manu N. Lakshmanan, Duke Univ. Medical Ctr. (USA); Joel A. Greenberg, Duke Univ. (USA); Ehsan Samei, Anuj J. Kapadia, Duke Univ. Medical Ctr. (USA) . . . . . [9412-48]

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

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CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 2
Room: Crystal E . . . . . Tue 10:10 am to 12:10 pm

Keynote and Diffusion MRI Analysis
Session Chairs: **Olivier Salvado,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Sébastien Ourselin,** Univ. College London (UK)

10:10 am: **The open microscopy environment: open image informatics for the life and biomedical sciences** *(Keynote Presentation)*, Jason Swedlow, Univ. of Dundee (UK) . . . . [9413-6]

11:10 am: **Tractography of the optic radiation with diffusion compartment imaging and multi-fascicle modeling**, Jolene Singh, Boston Children's Hospital (USA); Rory J. Piper, College of Medicine and Veterinary Medicine, The Univ. of Edinburgh (UK); Vinay Jayaram, Boston Children's Hospital (USA); Benoit Scherrer, Maxime Taquet, Onur Afacan, Boston Children's Hospital (USA) and Harvard Medical School (USA); Sean Clancy, Boston Children's Hospital (USA); Simon K. Warfield, Boston Children's Hospital (USA) and Harvard Medical School (USA) . . . . . .[9413-7]

11:30 am: **7T multi-shell hybrid diffusion imaging (HYDI) for mapping brain connectivity in mice**, Madelaine Daianu, Neda Jahanshad, Julio E. Villalon-Reina, Gautam Prasad, The Univ. of Southern California (USA); Russell E. Jacobs, Samuel Barnes, California Institute of Technology (USA); Berislav V. Zlokovic, Axel Montagne, Paul M. Thompson, The Univ. of Southern California (USA) . . . . . .[9413-8]

11:50 am: **Measuring the lesion load of multiple sclerosis patients within the corticospinal tract**, Jan Klein, Fraunhofer MEVIS (Germany); Katrin Hanken, Klinikum Bremen-Ost (Germany); Jasna Koceva, Fraunhofer MEVIS (Germany); Helmut Hildebrandt, Klinikum Bremen-Ost (Germany) and Institut für Psychologie, Carl von Ossietzky Univ. Oldenburg (Germany); Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . .[9413-9]

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

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CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 9
Room: Crystal D . . . . . Tue 10:10 am to 12:10 pm

Prostate and Colon II
Session Chairs: **Kensaku Mori,** Nagoya Univ. (Japan); **Janne J. Näppi,** Massachusetts General Hospital (USA)

10:10 am: **Characterization of aggressive prostate cancer using ultrasound RF time series**, Amir Khojaste, Farhad Imani, Queen's Univ. (Canada); Mehdi Moradi, The Univ. of British Columbia (Canada); David Berman, D. Robert Siemens, Eric E. Sauerberi, Alexander H. Boag, Kingston General Hospital (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada); Parvin Mousavi, Queen's Univ. (Canada). . . . . [9414-106]

10:30 am: **Multimodal classification of prostate tissue: a feasibility study on combining multiparametric MRI and ultrasound**, Hussam A. Ashab, Nandinee F. Haq, Guy Nir, Piotr Kozlowski, The Univ. of British Columbia (Canada); Peter Black, UBC (USA); Edward Jones, S. Larry Goldenberg, Tim E. Salcudean, The Univ. of British Columbia (Canada); Mehdi Moradi, The Univ. of British Columbia (Canada) and IBM Research Almaden (USA) . . . . . [9414-46]

10:50 am: **Towards intraoperative surgical margin assessment and visualization using bioimpedance properties of the tissue**, Shadab Khan, Aditya Mahara, Thayer School of Engineering at Dartmouth (USA); Elias S. Hyams, Alan R. Schned, Dartmouth Hitchcock Medical Ctr. (USA); Ryan J. Halter, Thayer School of Engineering at Dartmouth (USA) . . . . . [9414-47]

11:10 am: **Quantification, validation, and follow up of small bowel motility in Crohn's disease**, Juan J. Cerrolaza, Children's National Medical Ctr. (USA); Jennifer Q. Peng, Princeton Univ. (USA) and Children's National Health System (USA); Nabile M. Safdar, Children's National Health System (USA); Laurie Conklin, Children's National Health System (USA); Raymond W. Sze, Children's National Medical Ctr. (USA); Marius George Linguraru, Children's National Medical Ctr. (USA) and The George Washington Univ. (USA)[9414-48]

11:30 am: **A content-based image retrieval method for optical colonoscopy images based on image recognition techniques**, Hirokazu Nosato, Hidenori Sakanashi, Eiichi Takahashi, Masahiro Murakawa, National Institute of Advanced Industrial Science and Technology (Japan) . . . . . [9414-49]

11:50 am: **Detection of colonic polyp candidates with level set-based thickness mapping over the colon wall**, Hao Han, Stony Brook Medicine (USA); Lihong C. Li, College of Staten Island (USA); Chaijie Duan, Graduate School at Shenzhen, Tsinghua Univ. (USA); Yang Zhao, Stony Brook Medicine (USA); Huafeng Wang, Beihang Univ. (China); Zhengrong Liang, Stony Brook Medicine (USA). . . . . [9414-50]

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

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 9
Room: Oceans 4 . . . . . Tue 10:10 am to 12:10 pm

Intraoperative Imaging and Visualization
Session Chairs: **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ. (USA); **George J. Grevera,** Saint Joseph's Univ. (USA)

10:10 am: **Atlas and feature based 3D pathway visualization enhancement for skull base pre-operative fast planning from head CT**, Nava Aghdasi, Yangming Li, Angelique Berens, Kris S Moe, Randall A Bly, Blake Hannarord, Univ. of Washington (USA) . . . . . [9415-43]

10:30 am: **Design and first implementation of business process visualization for a task manager supporting the workflow in an operating room**, Elena Fink, Markus Wiemuth, Oliver Burgert, Reutlingen Univ. (Germany) . . . . . [9415-44]

10:50 am: **Quantitative wavelength analysis and image classification for intraoperative cancer diagnosis with hyperspectral imaging**, Guolan Lu, Xulei Qin, Dongsheng Wang, Georgia Z. Chen, Baowei Fei, Emory Univ. (USA) . . . . . [9415-45]

11:10 am: **Methods for a fusion of optical coherence tomography and stereo camera image data**, Jan N. Bergmeier, Dennis Kundrat, Andreas Schoob, Lüder A. Kahrs, Tobias Ortmaier, Leibniz Univ. Hannover (Germany) . . . . . [9415-46]

11:30 am: **Self-calibration of cone-beam CT geometry using 3D-2D image registration: development and application to tasked-based imaging with a robotic C-arm**, Sarah Ouadah, Joseph W. Stayman, Grace J. Gang, Ali Uneri, Johns Hopkins Univ. (USA); Tina Ehtiati, Siemens Healthcare (USA); Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9415-47]

11:50 am: **A multimodal imaging framework for enhanced robot-assisted partial nephrectomy guidance**, Ryan J. Halter, Xiaotian Wu, Dartmouth College (USA); Alex Hartov, Thayer School of Engineering at Dartmouth (USA); John Seigne, Dartmouth College (USA); Shadab Khan, Thayer School of Engineering at Dartmouth (USA) . . . . . [9415-48]

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

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TUESDAY 24 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

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

Breast Imaging
Session Chairs: **Hilde Bosmans,** Katholieke Univ. Leuven (Belgium); **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of)

1:20 pm: **Monte Carlo evaluation of the relationship between absorbed dose and contrast-to-noise ratio in coherent scatter breast CT**, Bahaa Ghammraoui, Andreu Badal, Lucretiu M. Popescu, U.S. Food and Drug Administration (USA) . . . . . [9412-49]

1:40 pm: **Monte Carlo simulation of breast tomosynthesis: visibility of microcalcifications at different acquisition schemes**, Hannie Petersson, Magnus Dustler, Pontus A. Timberg, Anders Tingberg, Lund Univ. (Sweden) . . . . . [9412-50]

2:00 pm: **Asymmetric scatter kernels for software-based scatter correction of gridless mammography**, Adam S. Wang, Varian Medical Systems, Inc (USA); Edward G. Shapiro, Sungwon Yoon, Cesar H. Proano, Rick Colbeth, Varian Medical Systems, Inc. (USA); Erkki Lehto, Planmed Oy (Finland); Josh M. Star-Lack, Varian Medical Systems, Inc. (USA) . . . . [9412-51]

2:20 pm: **Anatomical noise power in breast imaging with differential phase contrast and dark field imaging**, John W. Garrett, Yongshuai Ge, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-52]

2:40 pm: **Three dimensional dose distribution comparison of simple and complex acquisition trajectories in dedicated breast CT using radiochromic film**, Jainil P. Shah, Steve D. Mann, Duke Univ. (USA); Randolph L. McKinley, ZumaTek, Inc. (USA); Martin P. Tornai, Duke Univ. (USA) . . . . . [9412-53]

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

9412 continues on page 46

CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 3
Room: Crystal E . . . . Tue 1:20 pm to 3:00 pm

Image Representation and Reconstruction
Session Chairs: **Dzung L. Pham,** Henry M. Jackson Foundation (USA); **Kensaku Mori,** Nagoya Univ. (Japan)

1:20 pm: **Joint multi-shot multi-channel image reconstruction in compressive diffusion weighted MR imaging**, Hao Zhang, Yunmei Chen, Univ. of Florida (USA); Feng Huang, Philips Research (China); Eduardo Pasiliao Jr., Air Force Research Lab. (USA) . . . . . [9413-10]

1:40 pm: **Multi-contrast magnetic resonance image reconstruction**, Meng Liu, Yunmei Chen, Hao Zhang, Univ. of Florida (USA); Feng Huang, Philips Healthcare (Suzhou) Co. Ltd. (China) . . . . . [9413-11]

2:00 pm: **Image-based compensation for involuntary motion in weight-bearing C-arm CT scanning of knees**, Mathias Unberath, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Jang-Hwan Choi, Stanford Univ. (USA); Martin Berger, Andreas K. Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rebecca Fahrig, Stanford Univ. (USA) . . . . . [9413-12]

2:20 pm: **Super-resolution for medical image corrupted by heavy noise**, Dai Viet Tran, Marie Luong, Li-Thao-Té Sébastien, Jean-Marie Rocchisani, Françoise Dibos, Univ. Paris 13 (France); Thuong Le-Tien, Vietnam National Univ. (Viet Nam) [9413-13]

2:40 pm: **Spline-based sparse tomographic reconstruction with Besov priors**, Elham Sakhaee, Alireza Entezari, Univ. of Florida (USA) . . . . . [9413-14]

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

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CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

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

PANEL DISCUSSION
CAD Grand Challenge-Present and Future
Moderators: **Lubomir M. Hadjiiski**, Univ. of Michigan Health System (USA); **Georgia D. Tourassi**, Oak Ridge National Lab. (USA)

Panelists: **Samuel G. Armato**, The Univ. of Chicago (USA); **Karen Drukker**, The Univ. of Chicago Medical Ctr. (USA); **Laurence P. Clarke**, National Cancer Institute (USA); **George Redmond**, National Cancer Institute (USA); **Stephen Aylward**, Kitware, Inc. (USA); **Nicholas A. Petrick**, U.S. Food and Drug Administration (USA)

Grand challenges provide a unique opportunity for bringing together scientists from academia, industry, and the government with the objective to evaluate and compare different algorithms in a structured, direct way.

This panel will provide a forum for discussion of the current experience with CAD grand challenges and the future potential of these avenues for evaluation and testing of decision support systems. The panel includes experts from academia, National Cancer Institute (NCI), Food and Drug Administration (FDA) and industry. The panel members and the audience will discuss current and future opportunities for CAD grand challenges to become important testbeds and to enable cross platforms for decision support system evaluation. By efficient planning and coordination among key organizing institutions, CAD grand challenges can play a vital role in the selection of promising classes of algorithms and systems for further clinical translational efforts, prompting advances in computer-aided diagnosis and ultimately precision medicine.

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

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: Oceans 4

SESSION 10
Room: Oceans 4 . . . . Tue 1:20 pm to 3:00 pm

Keynote and 2D/3D Registration
Session Chairs: **Robert J. Webster III,** Vanderbilt Univ. (USA); **Ziv R. Yaniv,** Children's National Medical Ctr. (USA)

1:20 pm: **Twenty-five years of error** *(Keynote Presentation)*, J. Michael Fitzpatrick, Vanderbilt Univ. (USA). . . . . [9415-49]

2:20 pm: **Known-component 3D-2D registration for image guidance and quality assurance in spine surgery pedicle screw placement**, Ali Uneri, Joseph W. Stayman, Tharindu D. Silva, Adam S. Wang, Johns Hopkins Univ. (USA); Gerhard Kleinszig, Sebastian Vogt, Siemens AG (Germany); Jean-Paul Wolinsky, Ziya L. Gokaslan, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9415-50]

2:40 pm: **Device and methods for gold standard registration of clinical 3D and 2D cerebral angiograms**, Hennadii Madan, Uroš Mitrovic, Ziga Spiclin, Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia). . . . . [9415-51]

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

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CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Oceans 2

SESSION 1
Room: Oceans 2 . . . . .Tue 1:20 pm to 3:00 pm

Novel Imaging Techniques and Applications
Session Chairs: **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA); **Barjor Gimi,** Geisel School of Medicine (USA)

1:20 pm: **Developing hyperpolarized silicon particles for advanced biomedical imaging applications**, Nicholas Whiting, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); Jingzhe Hu, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA) and Rice Univ. (USA); Pamela Canstaninou, Rice Univ. (USA); Niki Z. Millward, James A. Bankson, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); David Gorenstein, The Univ. of Texas Health Science Ctr. at Houston (USA); Anil Sood, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); Daniel Carson, Rice Univ. (USA); Pratip K. Bhattacharya, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA) . . . . . [9417-1]

1:40 pm: **Development of a diaphragmatic motion-based elastography framework for assessment of liver stiffness**, Jared A. Weis, Allison M. Johnsen, Geoffrey E. Wile, Thomas E. Yankeelov, Richard G. Abramson, Michael I. Miga, Vanderbilt Univ. (USA) . . . . [9417-2]

2:00 pm: **Repeatability assessment of modality independent elastography in a pre-clinical murine model**, Katelyn M. Flint, Jared A. Weis, Thomas E. Yankeelov, Michael I. Miga, Vanderbilt Univ. (USA) . . . . . [9417-3]

2:20 pm: **Nanoscale structural and chemical imaging of single bacterial cells for assessment of antibiotic resistance effects**, Boyin Liu, Jiayao Li, Yeonuk Kim, Jing Fu, Monash Univ. (Australia) . . . . . [9417-4]

2:40 pm: **A hand-held EPR scanner for transcutaneous oximetry**, Periannan Kuppusamy, Dartmouth College (USA) . . . . . [9417-5]

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

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TUESDAY 24 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

SESSION 11
Room: Crystal C . . . . .Tue 3:30 pm to 4:50 pm

Radiation Dose and Dosimetry

Session Chairs: **Bruce R. Whiting,** Univ. of Pittsburgh (USA); **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada)

3:30 pm: **Fluid-filled dynamic bowtie filter: a feasibility study**, Picha Shunhavanich, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9412-54]

3:50 pm: **Imaging task-based optimal kV and mA selection for CT radiation dose reduction: from filtered backprojection (FBP) to statistical model based iterative reconstruction (MBIR)**, Ke Li, Daniel Gomez-Cardona, Meghan G. Lubner, Perry J. Pickhardt, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-55]

4:10 pm: **First results from a prototype dynamic attenuator system**, Scott S. Hsieh, Mark V. Peng, Christopher A. May, Picha Shunhavanich, Norbert J. Pelc, Stanford Univ. (USA). . . . . [9412-56]

4:30 pm: **Ultra low radiation dose digital subtraction angiography (DSA) imaging using low rank constraint**, Kai Niu, Yinsheng Li, Univ. of Wisconsin-Madison (USA); Sebastian Schafer, Kevin L. Royalty, Siemens Medical Solutions USA, Inc. (USA); Yijing Wu, Charles M. Strother, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-57]

WORKSHOP

Power of pathology: predicting disease aggressiveness from tissue slides

Room: Crystal C · Tue 5:00 pm to 7:00 pm

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

See Special Events for additional information.

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CONFERENCE 9413
Image Processing

Rooms: Crystal E

SESSION 4
Room: Crystal E . . . . Tue 3:30 pm to 4:50 pm

Compressed Sensing/Sparse Methods

Session Chairs: **Baowei Fei,** Emory Univ. (USA); **Murray H. Loew,** The George Washington Univ. (USA)

3:30 pm: **Rank-sparsity constrained atlas construction and phenotyping**, Darin P. Clark, Cristian T. Badea, Duke Univ. Medical Ctr. (USA) and Ctr. for In Vivo Microscopy (USA). . . . . [9413-15]

3:50 pm: **Compressed sensing MRI using higher order multi-scale FREBAS for sparsifying transform function**, Satoshi Ito, Utsunomiya Univ. (Japan); Kenji Ito, Utsunomiya Univeristy (Japan) and Utsunomiya Univ. (Japan); Mone Shibuya, Yoshifumi Yamada, Utsunomiya Univeristy (Japan) . . . . . [9413-16]

4:10 pm: **Intraparenchymal hemorrhage segmentation from clinical head CT of patients with traumatic brain injury**, Snehashis Roy, Henry M. Jackson Foundation (USA); Sean Wilkes, Ramon Diaz-Arrastia, Uniformed Services Univ. of the Health Sciences (USA); John A. Butman, National Institutes of Health (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA) . . . . . [9413-17]

4:30 pm: **Alternating minimization algorithm with iteratively reweighted quadratic penalties for compressive transmission tomography**, Yan Kaganovsky, Shaobo Han, Duke Univ. (USA); Soysal Degirmenci, Washington Univ. in St. Louis (USA); Ikenna Odinaka, Andrew D. Holmgren, Duke Univ. (USA); David G. Politte, Joseph A. O'Sullivan, Washington Univ. in St. Louis (USA); Lawrence Carin, Duke Univ. (USA). . . . . [9413-18]

WORKSHOP

Imaging Genetics

Room: Crystal E · Tue 5:00 pm to 7:00 pm

Workshop Chair:
Boudewijn P. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands)

See Special Events for additional information.

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CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

SESSION 11
Room: Crystal D . . . . Tue 3:30 pm to 4:50 pm

Vessels, Heart, and Eye II

Session Chairs: **Thomas M. Deserno,** Univ. Hospital Aachen (Germany); **Marleen de Bruijne,** Erasmus MC (Netherlands)

3:30 pm: **Automated measurement of pulmonary artery in low-dose non-contrast chest CT images**, Yiting Xie, Cornell Univ. (USA); Mingzhu Liang, David F. Yankelevitz, Claudia I. Henschke, Icahn School of Medicine at Mount Sinai (USA); Anthony P. Reeves, Cornell Univ. (USA). . . . . [9414-51]

3:50 pm: **Quantitative analysis of arterial flow properties for detection of non-calcified plaques in ECG-gated coronary CT angiography**, Jun Wei, Chuan Zhou, Heang-Ping Chan, Aamer R. Chughtai, Prachi Agarwal, Jean W. Kuriakose, Lubomir M. Hadjiiski, Smita Patel, Ella A. Kazerooni, Univ. of Michigan Health System (USA) . . . . . [9414-52]

4:10 pm: **Automated age-related macular degeneration classification in OCT using unsupervised feature learning**, Freerk G. Venhuizen, Bram van Ginneken, Mark J. van Grinsven, Bart Bloemen, Rick H. H. M. Philipsen, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Carel B. Hoyng, Radboud Univ. Nijmegen (Netherlands); Thomas Theelen, Clarisa I. Sánchez, Radboud Univ. Nijmegen Medical Ctr. (Netherlands). . . . . [9414-53]

4:30 pm: **Automatic discrimination of color retinal images using the bag of words approach**, Ibrahim Sadek I. Hussein Tahoun, Désiré Sidibé, Fabrice Meriaudeau, Univ. de Bourgogne (France) . . . . . [9414-54]

WORKSHOP

Live Demonstrations

Room: Oceans Ballroom
Tue 5:00 pm to 7:00 pm

Workshop Chairs:
Stephen R. Aylward, Ktiware Inc. (USA) and **Heang-Ping Chan**, Univ. of Michigan Health System (USA)

See Special Events for additional information.

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CONFERENCE 9415
Image-Guided Procedures, Robotic Interventions, and Modeling

Room: Oceans 4

SESSION 11
Room: Oceans 4 . . . . .Tue 3:30 pm to 4:50 pm

Abdominal and Pelvic Procedures

Session Chairs: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Parvin Mousavi,** Queen's Univ. (Canada)

3:30 pm: **Data fusion for planning target volume and isodose prediction in prostate brachytherapy**, Saman Nouranian, Mahdi Ramezani, The Univ. of British Columbia (Canada); S. Sara Mahdavi, The Univ. of British Columbia (Canada) and British Columbia Cancer Agency (Canada); Ingrid Spadinger, William J. Morris, British Columbia Cancer Agency (Canada); Tim E. Salcudean, The Univ. of British Columbia (Canada); Purang Abolmaesumi, British Columbia Cancer Agency (Canada) . . . . . [9415-52]

3:50 pm: **Optimizing MRI-targeted fusion prostate biopsy: the effect of systematic error and anisotropy on tumor sampling**, Peter R. Martin, Derek W. Cool, Cesare Romagnoli, Aaron Fenster, Aaron D. Ward, Western Univ. (Canada) . . . . . [9415-53]

4:10 pm: **Navigated placement of markers for motion compensation in radiotherapy**, Adrian Winterstein, Keno März, Alfred M. Franz, Deutsches Krebsforschungszentrum (Germany); Mohammadreza Hafezi, Nassim Fard, Ruprecht-Karls-Univ. Heidelberg (Germany); Florian Sterzing, Deutsches Krebsforschungszentrum (Germany); Arianeh Mehrabi, Ruprecht-Karls-Univ. Heidelberg (Germany); Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany) . . . . . [9415-54]

4:30 pm: **Image guidance improves localization of sonographically occult colorectal liver metastases**, Universe Leung, Memorial Sloan-Kettering Cancer Ctr. (USA); Amber L. Simpson, Vanderbilt Univ. (USA); Lauryn B. Adams, William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (USA); Michael I. Miga, Vanderbilt Univ. (USA); T. Peter Kingham, Memorial Sloan-Kettering Cancer Ctr. (USA) . . . . [9415-55]

CONFERENCE 9415 ENDS

CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 2
Room: Oceans 2 . Tue 3:30 pm 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: **Multi-atlas segmentation for abdominal organs with Gaussian mixture models**, Ryan P. Burke, Zhoubing Xu, Christopher P. Lee, Rebeccah B. Baucom, Benjamin K. Poulose, Richard G. Abramson, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9417-6]

3:50 pm: **Quantification of esophageal wall thickness in CT using atlas-based segmentation technique**, Jiahui Wang, Univ. of Maryland Medical Ctr. (USA); Min Kyu Kang, Univ. of Maryland, Baltimore (USA) and Yeungnam Univ. (Korea, Republic of); Seth Kligerman, Univ. of Maryland School of Medicine (USA); Wei Lu, The Univ. of Maryland (USA) . . [9417-7]

4:10 pm: **Fully automatic algorithm for segmenting full human diaphragm in non-contrast CT Images**, Elham Karami, Western Univ. (Canada) and Robarts Research Institute (Canada); Stewart Gaede, London Health Sciences Ctr. (Canada) and Western Univ. (Canada); Ting-Yim Lee, Lawson Health Research Institute (Canada) and Robarts Research Institute (Canada) and Western Univ. (Canada); Abbas Samani, Western Univ. (Canada) and Robarts Research Institute (Canada) . . . . . [9417-8]

4:30 pm: **Progress toward automatic classification of human brown adipose tissue using biomedical imaging**, Aliya Gifford, Vanderbilt Univ., Institute of Imaging Science (USA); Theodore F. Towse, Vanderbilt Univ. School of Medicine (USA) and Vanderbilt Univ., Institute of Imaging Science (USA); Ronald C. Walker, Tennessee Valley Healthcare System (USA); Malcom J. Avison, Vanderbilt Univ., Institute of Imaging Science (USA) and Vanderbilt Univ. School of Medicine (USA); Edward B. Welch, Vanderbilt Univ., Institute of Imaging Science (USA). . . . . [9417-9]

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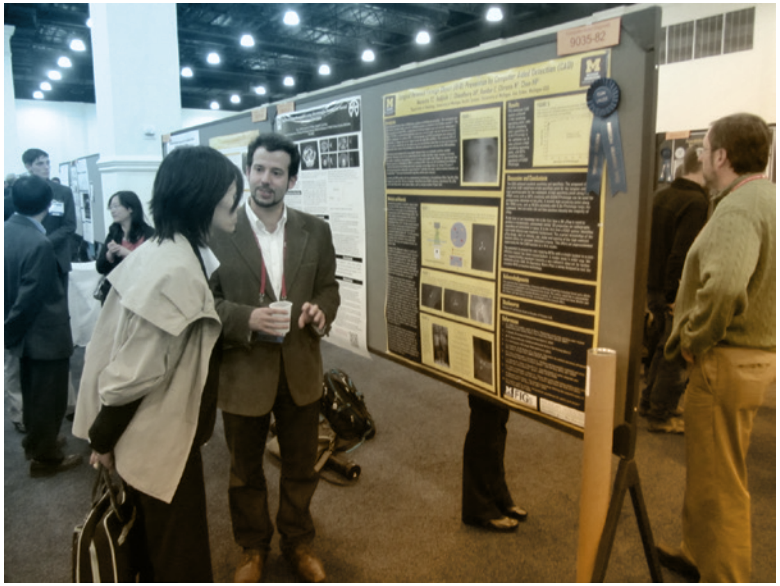
TUESDAY WORKSHOP · Room Oceans 4 · Tue. 5:00 pm to 7:00 pm
Computing in Medical Imaging: The Future is in the Cloud
Workshop Chair: **Claudia R. Mello-Thoms,** The Univ. of Sydney (Australia), Univ. of Pittsburgh (USA)
See Special Events for additional information.

Participate in the Poster Sessions

Gain valuable feedback and one-on-one networking with colleagues.



TUESDAY/WEDNESDAY POSTERS

Location: Oceans Ballroom

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 9413

Image Processing

Liver segmentation by using iterative and hybrid strategy for CT images, Dengwang Li, Shandong Normal Univ. (China); Jie Wang, Univ. of Jinan (China); Jinhu Chen, Yong Yin, Shandong Cancer Hospital and Institute (China). . . . [9413-63]

Evaluating intensity normalization for multispectral classification of carotid atherosclerotic plaque, Shan Gao, Ronald van't Klooster, Leiden Univ. Medical Ctr. (Netherlands); Diederik F. van Wijk, Aart J. Nederveen, Academisch Medisch Centrum (Netherlands); Boudewijn P. F. Lelieveldt, Rob J. van der Geest, Leiden Univ. Medical Ctr. (Netherlands). . . . . [9413-64]

Segmentation of skin strata in reflectance confocal microscopy depth stacks, Samuel C. Hames, Dermatology Research Ctr., The Univ. of Queensland School of Medicine (Australia); Marco Ardigò, San Gallicano Dermatological Institute – IRCCS (Italy); H. Peter Soyer, Dermatology Research Ctr., The Univ. of Queensland School of Medicine (Australia); Andrew P Bradley, Univ. of Queensland (Australia); Tarl W. Prow, Dermatology Research Ctr., The Univ. of Queensland School of Medicine (Australia) . . . [9413-65]

Towards high-throughput mouse embryonic phenotyping: a novel approach to classifying ventricular septal defects, Xi Liang, The Univ. of Melbourne (Australia) and National Institute of Informatics (Japan); Zhongliu Xie, Imperial College London (UK) and National Institute of Informatics (Japan); Masaru Tamura, RIKEN BioResource Ctr. (Japan) and National Institute of Genetics (Japan); Toshihiko Shiroishi, National Institute of Genetics (Japan); Asanobu Kitamoto, National Institute of Informatics (Japan) and The Graduate Univ. for Advanced Studies (SOKENDAI) (Japan) . . . . [9413-66]

A primal dual fixed point algorithm for constrained optimization problems with applications to image reconstruction, Yuchao Tang, Nanchang Univ. (China). . . . . [9413-67]

Cerenkov luminescence tomography based on preconditioning orthogonal matching pursuit, Haixiao Liu, Zhenhua Hu, Kun Wang, Jie Tian, Xin Yang, Institute of Automation (China). . . . . [9413-68]

Beam hardening correction for sparse-view CT reconstruction, Wen Lei Liu, Hongbing Lu, Junyan Rong, Qimei Liao, Peng Gao, Fourth Military Medical Univ. (China). . . . . [9413-69]

Heritability analysis of surface-based cortical thickness estimation on a large twin cohort, Kaikai Shen, Vincent Doré, Stephen E. Rose, Jurgen Fripp, Australian e-Health Research Ctr. (Australia); Katie L. McMahon, Ctr. for Advanced Imaging, The Univ. of Queensland (Australia); Greig I. de Zubicaray, The Univ. of Queensland (Australia); Nicholas G. Martin, Queensland Institute of Medical Research (Australia); Paul M. Thompson, Institute for Neuroimaging and Informatics, The Univ. of Southern California (USA); Margaret J. Wright, Queensland Institute of Medical Research (Australia); Olivier Salvado, Australian e-Health Research Ctr. (Australia) . . . . . [9413-70]

Estimating diffusion properties in complex fiber configurations based on structure-adaptive multi-valued tensor-field filtering, Jianfei Yang, Technische Univ. Delft (Netherlands) and Academisch Medisch Centrum (Netherlands); Dirk H. J. Poot, Georgius A. M. Arkesteijn, Technische Univ. Delft (Netherlands) and Erasmus MC (Netherlands); Matthan W. A. Caan, Academisch Medisch Centrum (Netherlands); Lucas J. van Vliet, Technische Univ. Delft (Netherlands); Frans M. Vos, Technische Univ. Delft (Netherlands) and Academisch Medisch Centrum (Netherlands). . . . . [9413-71]

Joint brain connectivity estimation from diffusion and functional MRI data, Shu-Hsien Chu, Christophe Lenglet, Keshab K. Parhi, The Univ. of Minnesota, Twin Cities (USA). . . . . [9413-72]

Communication of brain network core connections altered in behavioral variant frontotemporal dementia but possibly preserved in early-onset Alzheimer's disease, Madelaine Daianu, Institute for Neuroimaging and Informatics, The Univ. of Southern California (USA); Neda Jahanshad, The Univ. of Southern California (USA); Mario F. Mendez, Alzheimer's Disease Research Ctr., Univ. of California Los Angeles (USA); George Bartzokis, Semel Institute (USA); Elvira E. Jimenez, Alzheimer's Disease Research Ctr., Univ. of California Los Angeles (USA); Paul M Thompson, Univ. of Southern California (USA) . . . . . [9413-73]

Comparisons of topological properties in autism for the brain network construction methods, Min-Hee Lee, Dong Youn Kim, Sang Hyeon Lee, Jin Uk Kim, Yonsei Univ. (Korea, Republic of); Moo K. Chung, Univ. of Wisconsin-Madison (USA). . . . . [9413-74]

A novel method for 4D cone-beam computer-tomography reconstruction, Hao Zhang, Univ. of Florida (USA); Justin C. Park, Univ. of Florida College of Medicine (USA); Yunmei Chen, Univ. of Florida (USA); Bo Lu, Univ. of Florida College of Medicine (USA); Guanghui Lan, Univ. of Florida (USA). . . . . [9413-76]

Partial volume correction for arterial spin labeling data using spatial-temporal information, Yang Liu, Baojuan Li, Xi Zhang, Linchuan Zhang, Fourth Military Medical Univ. (China); Zhengrong Liang, The State Univ. of New York (USA); Hongbing Lu, Fourth Military Medical Univ. (China). . . . . [9413-77]

Intensity transform and Wienner filter in measurement of blood flow in arteriography, Polyana F. Nunes, Marcelo Franco, João Batista Filho, Ana Claudia Patrocinio, UFU (Brazil) . . . . . [9413-78]

Tchebichef moments based nonlocal-means method for despeckling Optical coherence tomography images, Wanying Jiang, Wenqi Xiang, Mingyue Ding, Xuming Zhang, Huazhong Univ. of Science and Technology (China). . . . . [9413-79]

Multi-session complex averaging for high resolution high SNR 3T MR visualization of ex vivo hippocampus and insula, Aymeric Stamm, Boston Children's Hospital (USA) and Harvard Medical School (USA); Jolene Singh, Boston Children's Hospital (USA); Benoit Scherrer, Onur Afacan, Simon K. Warfield, Boston Children's Hospital (USA) and Harvard Medical School (USA) . . [9413-80]

Total variation based image deconvolution for extended depth-of-field microscopy images, Frank Hausser, Ingeborg E. Beckers, Ozan Kahraman, Beuth Hochschule für Technik Berlin (Germany); Michael Gierlak, Beuth University of Applied Sciences (Germany) . . . . . [9413-81]

Beyond Frangi: an improved multiscale vesselness filter, Tim Jerman, Franjo Pernu?, Bo?tjan Likar, Ziga Spiclin, Univ. of Ljubljana (Slovenia). . . . . [9413-82]

High performance 3D adaptive filtering for DSP based portable medical imaging systems, Olivier Bockenbach, TechGmbh. Com (Germany); Murtaza Ali, Texas Instruments Inc. (USA); Ian Wainwright, ContextVision AB (Sweden); Mark Nadeski, Texas Instruments Inc. (USA) . . . . [9413-83]

Directional denoising and line enhancement for device segmentation in real time fluoroscopic imaging, Martin G. Wagner, Univ. of Wisconsin-Madison (USA); Kevin L. Royalty, Siemens Medical Solutions USA, Inc. (USA) and Univ. of Wisconsin-Madison (USA); Erick L. Oberstar, Charles M. Strother, Charles A. Mistretta, Univ. of Wisconsin-Madison (USA) . . . . . [9413-84]

Trade-off between speed and performance for colorectal endoscopic NBI image classification, Shoji Sonoyama, Tsubasa Hirakawa, Toru Tamaki, Bisser Raytchev, Kazufumi Kaneda, Tetsushi Koide, Yoko Kominami, Shigeto Yoshida, Shinji Tanaka, Hiroshima Univ. (Japan) . . . . . [9413-85]

Automatic localization of vertebrae based on convolutional neural networks, Wei Shen, Institute of Automation (China); Feng Yang, Beijing Jiaotong Univ. (China); Wei Mu, Caiyun Yang, Xin Yang, Jie Tian, Institute of Automation (China) . . . . . [9413-86]

Detection of anomaly in human retina using Laplacian Eigenmaps and vectorized matched filtering, Karamatou A. Yacoubou Djima, Lucia Simonelli, Univ. of Maryland, College Park (USA); Denise Cunningham, National Institute of Health (USA); Wojciech Czaja, Univ. of Maryland, College Park (USA) . . . . . [9413-87]

Direct volume estimation without segmentation, Xiantong Zhen, Western Univ. (Canada); Zhijie Wang, GE Healthcare (Canada); Ali Islam, St. Joseph's Health Care London (Canada); Mousumi Bhaduri, Ian Chan, London Health Sciences Ctr. (Canada); Shuo Li, GE Healthcare (Canada) . . . . . [9413-88]

Spot counting on fluorescence in situ hybridization in suspension images using Gaussian mixture model, Sijia Liu, Ruhan Sa, Univ. at Buffalo (USA); Orla Maguire, Hans Minderman, Roswell Park Cancer Institute (USA); Vipin Chaudhary, Univ. at Buffalo (USA) . . . . . [9413-89]

Automatic detection of endothelial cells in 3D angiogenic sprouts from experimental phase contrast images, MengMeng Wang, Nanyang Technological Univ. (Singapore); Lee-Ling S. Ong, SMART-Singapore MIT Alliance for Research & Technology (Singapore); Justin Dauwels, Nanyang Technological Univ. (Singapore); Harry Asada, Massachusetts Institute of Technology (USA) . . . . [9413-90]

Method for accurate sizing of pulmonary vessels from 3D medical images, Walter G. O'Dell, Univ. of Florida (USA) . . . . . [9413-91]

Optimal reinforcement of training dataset in supervised landmark-based segmentation, Bulat Ibragimov, Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia); Tomaž Vrtovec, Univ of Ljubljana (Slovenia) . . . . . [9413-92]

Freehand 3D ultrasound reconstruction based on global filling model, Weijian Cong, Jian Yang, Danni Ai, Leiya Ma, Yue Liu, Yongtian Wang, Beijing Institute of Technology (China) . . . . . [9413-93]

Piecewise recognition of bone skeleton profiles via an iterative Hough transform approach without re-voting, Anna Maria Massone, CNR (Italy); Giorgio Ricca, Univ degli Studi di Genova (Italy); Mauro C. Beltrametti, Michele Piana, Univ. degli Studi di Genova (Italy) . . . . . [9413-94]

A novel Hessian based algorithm for kidney glomeruli detection in 3D MRI, Min Zhang, Mayo Clinic Arizona (USA) and Arizona State Univ. (USA); Teresa Wu, Arizona State Univ. (USA); Kevin M. Bennett, Univ. of Hawai'i at Manoa (USA) . . . . . [9413-95]

Detection method of visible and invisible nipples on digital breast tomosynthesis, Seung-Hoon Chae, Ji-Wook Jeong, Sooyeul Lee, Electronics and Telecommunications Research Institute (Korea, Republic of); Eun Young Chae M.D., Hak Hee Kim M.D., Asan Medical Ctr. (Korea, Republic of); Young-Wook Choi, Korea Electrotechnology Research Institute (Korea, Republic of) . . . . . [9413-96]

Semi-automatic delineation of the spino-laminar junction curve on lateral x-ray radiographs of the cervical spine, Benjamin Narang, Ecole Nationale Supérieure de Techniques Avancées (France); Michael Phillips, City Univ. London (UK); Karen Knapp, Univ. of Exeter (UK); Andy Appelboam, Royal Devon & Exeter NHS Foundation Trust (UK); Adam Reuben, Royal Devon and Exeter NHS Foundation Trust (UK); Greg Slabaugh, City Univ. London (UK). . . . . [9413-97]

Evaluating MRI based vascular wall motion as a biomarker of Fontan hemodynamic performance, Haifa Hong, Shanghai Children's Medical Center, Shanghai Jiaotong Univ. School of Medicine (China); Prahlad G. Menon, SYS-CMU Joint Institute of Engineering (USA) and The Univ. of Texas at San Antonio (USA) and Univ. of Pittsburgh (USA) . . . . . [9413-98]

Evaluation of COPD's diaphragm motion extracted from 4D-MRI, Windra Swastika, Chiba Univ. (Japan); Yoshitada Masuda, Naoko Kawata, Koji Matsumoto M.D., Toshio Suzuki, Ken Iesato, Yuji Tada, Toshihiko Sugiura, Nobuhiro Tanabe, Koichiro Tatsumi, Chiba University Hospital (Japan); Takashi Ohnishi, Center for Frontier Medical Engineering (Japan); Hideaki Haneishi, Ctr. for Frontier Medical Engineering (Japan) . . . . . [9413-99]

Calculation of brain atrophy using computed tomography and a new atrophy measurement tool, Abdullah Bin Zahid, Artem Mikheev, Il Yang, Uzma Samadani, Henry H. Rusinek, New York Univ. Langone Medical Ctr. (USA) . . . . . [9413-100]

Automated detection of periventricular veins on 7 T brain MRI, Hugo J. Kuijf, Image Sciences Institute, Univ. Medical Ctr. Utrecht (Netherlands); Willem Bouvy, Utrecht Brain Ctr. Rudolf Magnus, Univ. Medical Ctr. Utrecht (Netherlands); Jaco J. M. Zwanenburg, Max A. Viergever, Image Sciences Institute (Netherlands); Geert Jan Biessels, Univ. Medical Ctr. Utrecht (Netherlands); Koen L. Vincken, Image Sciences Institute (Netherlands) [9413-101]

Automated coronary artery calcium scoring from non-contrast CT using a patient-specific algorithm, Xiaowei Ding, Cedars-Sinai Medical Ctr. (USA) and Univ. of California, Los Angeles (USA); Piotr J. Slomka, Mariana Diaz-Zamudio, Guido Germano, Daniel S. Berman, Cedars-Sinai Medical Ctr. (USA); Demetri Terzopoulos, Univ. of California, Los Angeles (USA); Damini Dey, Cedars-Sinai Medical Ctr. (USA) . . . . . [9413-102]

Computational analysis of PET by AIBL (CapAIBL): a cloud-based processing pipeline for the quantification of PET images, Pierrick T. Bourgeat, Vincent Doré, Jurgen Fripp, Australian e-Health Research Ctr. (Australia); Victor L. Villemagne, The Univ. of Melbourne (Australia); Chris Rowe, Austin Hospital (Australia); Olivier Salvado, Australian e-Health Research Ctr. (Australia) . . . . . [9413-103]

Image-based reconstruction of 3D myocardial infarct geometry for patient specific applications, Eranga Ukwatta, Johns Hopkins Univ. (USA); Martin Rajchl, Robarts Research Institute (Canada); James A. White, Univ. of Calgary (Canada); Farhad Pashakhanloo, Daniel A. Herzka, Elliot McVeigh, Albert C. Lardo, Natalia Trayanova, Fijoy G. Vadakkumpadan, Johns Hopkins Univ. (USA) . . . . [9413-104]

Initial evaluation of a modified dual-energy window scatter correction method for CZT-based gamma cameras for breast SPECT, Steve D. Mann, Martin P. Tornai, Duke Univ. (USA) . . . . [9413-105]

Schizophrenia patients differentiation based on MR vascular perfusion and volumetric imaging, Assaf B. Spanier, The Rachel and Selim Benin School of Computer Science and Engineering (Israel) and The Hebrew Univ. of Jerusalem (Israel); Leo Joskowicz, The Rachel and Selim Benin School of Computer Science and Engineering (Israel) and The Hebrew Univ. of Jerusalem (Israel) and The Edmond & Lily Safra Ctr. for Brain Sciences (Israel); Shay Moshel, David Israeli, Jerusalem Mental Health Ctr., The Hebrew Univ. Hadassah Medical School (Israel) . . . . . [9413-106]

2D-3D non-rigid registration using thin-plate spline and volume rendering, Jean Young Song, Charles R. Meyer, Univ. of Michigan (USA) . . . . . [9413-107]

Image registration based on the structure tensor of the local phase, Zhang Li, Lucas J. van Vliet, Technische Univ. Delft (Netherlands); Jaap Stoker, Academic Medical Ctr. (Netherlands); Frans M. Vos, Technische Univ. Delft (Netherlands) and Academisch Medisch Centrum (Netherlands) . . . . . [9413-108]

A liver registration method for segmented multi-phase CT images, Shuyue Shi, Rong Yuan, Zhi Sun, Qingguo Xie, Huazhong Univ. of Science and Technology (China) . . . . . [9413-109]

Non-rigid MRI-TRUS registration in targeted prostate biopsy, Bahram Marami, Robarts Research Institute (Canada); Shahin Sirouspour, McMaster Univ. (Canada); Suha Ghoul, Robarts Research Institute (Canada); Shadi Emami Abarghouei, McMaster Univ. (Canada); Yue Sun, Aaron Fenster, Robarts Research Institute (Canada) . . . . . [9413-110]

Deformable registration of CT and cone-beam CT by local CBCT intensity correction, Seyoun Park, The Johns Hopkins Hospital (USA); William Plishker, IGI Technologies (USA); Raj Shekhar, Children's National Medical Ctr. (USA); Harry Quon, John Wong, The Johns Hopkins Hospital (USA); Junghoon Lee, Johns Hopkins Univ. (USA) . . . . [9413-111]

A fast alignment method for breast MRI follow-up studies using automated breast segmentation and current-prior registration, Lei Wang, Jan Strehlow, Jan Ruehaak, Florian Weiler, Fraunhofer MEVIS (Germany); Yago Diez, Univ. de Girona (Spain); Albert Gubern-Mérida, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Susanne Diekmann, Hendrik Laue, Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . . [9413-112]

Image registration using stationary velocity fields parameterized by norm-minimizing Wendland kernel, Akshay Pai, Stefan Sommer, Lauge Sørensen, Sune Darkner, Jon Sporring, Univ. of Copenhagen (Denmark); Mads Nielsen, Univ. of Copenhagen (Denmark) and Biomediq (Denmark). . . . . [9413-113]

Tracking of deformable target in 2D ultrasound images, Lucas Royer, Institut de recherche technologique B-Com (France) and INRIA Rennes (France) and Institut National des Sciences Appliquées de Rennes (France); Maud Marchal, Institut National des Sciences Appliquées de Rennes (France) and Institut de recherche technologique B-Com (France); Anthony Le Bras, CHU Rennes (France); Guillaume Dardenne, Institut de recherche technologique B-Com (France); Alexandre Krupa, INRIA Rennes (France) and Institut de recherche technologique B-Com (France) . . . . . [9413-114]

Accurate CT-MR image registration for deep brain stimulation: a multi-observer evaluation study, Jan Rühaak, Alexander Derksen, Stefan Heldmann, Marc Hallmann, Hans Meine, Fraunhofer MEVIS (Germany) . . . . . [9413-115]

Annotation-free probabilistic atlas learning for robust anatomy detection in CT images, Astrid Franz, Nicole Schadewaldt, Heinrich Schulz, Torbjörn Vik, Philips Research (Germany); Lisa Kausch, Jan Modersitzki, Univ. zu Lübeck (Germany); Rafael Wiemker, Daniel Bystrov, Philips Research (Germany) . . . . [9413-116]

On the usefulness of gradient information in multi-objective deformable image registration using a B-spline-based dual-dynamic transformation model: comparison of three optimization algorithms, Kleopatra Pirpinia, The Netherlands Cancer Institute (Netherlands); Peter A. N. Bosman, Ctr. voor Wiskunde en Informatica (Netherlands); Jan-Jakob Sonke, Marcel B. van Herk, The Netherlands Cancer Institute (Netherlands); Tanja Alderliesten, Academisch Medisch Centrum (Netherlands). . . . . [9413-117]

Piecewise nonlinear image registration using DCT basis functions, Lin Gan, Gady Agam, Illinois Institute of Technology (USA) . . . . . [9413-118]

Personalized x-ray reconstruction of the proximal femur via a non-rigid 2D-3D registration, Weimin Yu, Philippe K. Zysset, Guoyan Zheng, Univ. Bern (Switzerland) . . . . . [9413-119]

A fast and memory efficient stationary wavelet transform for 3D cell segmentation, Dirk R. Padfield, GE Global Research (USA) . . . . . [9413-120]

Automated retinal fovea type distinction in spectral-domain optical coherence tomography of retinal vein occlusion, Jing Wu, Sebastian M. Waldstein, Bianca S. Gerendas, Georg Langs, Christian Simader, Ursula Schmidt-Erfurth, Medizinische Univ. Wien (Austria)[9413-121]

Evaluation of atlas-based white matter segmentation with eve, Andrew J. Plassard, Kendra E. Hinton, Vanderbilt Univ. (USA); Vijay Venkatraman, Christopher Gonzalez, Susan M. Resnick, National Institute on Aging (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9413-122]

Bright-field cell image segmentation by principal component pursuit with an Ncut penalization, Yuehuan Chen, Justin W. Wan, Univ. of Waterloo (Canada) . . . . . [9413-123]

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Microstructure analysis of the pulmonary acinus using a synchrotron radiation CT, Yoshitaka Tokumoto, Koichi Minami, Yoshiki Kawata, Noboru Niki, Univ. of Tokushima (Japan); Keiji Umetani, Japan Synchrotron Radiation Research Institute (Japan); Yasutaka Nakano, Shiga Univ. of Medical Science (Japan); Hiroaki Sakai, Hyogo Prefectural Amagasaki Hospital (Japan); Hironobu Ohmatsu, National Cancer Ctr. Hospital East (Japan); Harumi Itoh, Univ. of Fukui (Japan) . . . . . [9417-101]

Building a bone microCT images atlas for micro-architecture recognition, Erwan Freuchet, Univ. de Nantes (France); Benoit Recur, Andrew M. Kingston, The Australian National Univ. (Australia); Jean-Pierre V. Guédon, Univ. de Nantes (France); Yves Amouriq, Univ. of Nantes, Odontology (France) . . . . . [9417-102]

Bone vascularization and bone micro-architecture characterizations according to the microCT resolution, Eleonore Crauste, Florent Autrusseau, Jean-Pierre V. Guédon, Paul Pilet, Univ. de Nantes (France); Yves Amouriq, Univ. of Nantes (France); Pierre Weiss, Univ. de Nantes (France); Bernard Giumelli, Univ. of Nantes (France). . . . . [9417-103]

Pharmacokinetic characterization of tumor treatment response, Jonathan M. Martin, Arizona State Univ. (USA); Praveen K. Gulaka, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Vikram D. Kodibagkar, Arizona State Univ. (USA) . . . . . [9417-107]

Use of scanning probe microscopy for study of paraneoplastic changes in red blood cells in carcinogenesis dynamics, Tatyana Gening, Boris Kostishko, Antonina Tuzeeva, Dinara R. Dolgova, Inna Antoneeva, Tatyana Abakumova, Ekaterina Pchelintseva, Anastasiya Fomina, Ulyanovsk State Univ. (Russian Federation) . . . . . [9417-108]

Endoscopic Cerenkov luminescence imaging: in vivo small animal tumor model validation, Tianming Song, Chengpeng Bao, Harbin Univ. of Science and Technology (China); Zhenhua Hu, Kun Wang, Institute of Automation (China); Xia Liu, Harbin Univ. of Science and Technology (China); Jie Tian, Institute of Automation (China) . . . . . [9417-109]

Size based emphysema cluster analysis on low attenuation area in 3D volumetric CT: comparison with pulmonary functional test, Minho Lee, Namkug Kim, Sang Min Lee, Joon Beom Seo, Sang Young Oh, Univ. of Ulsan, Asan Medical Ctr. (Korea, Republic of).[9417-111]

CONFERENCE 9420
Digital Pathology

Performance assessment of automated tissue characterization for prostate H and E histopathology, Matthew D. DiFranco, Medizinische Univ. Wien (Austria); Hayley M. Reynolds, Peter MacCallum Cancer Ctr. (Australia) and The Univ. of Melbourne (Australia); Catherine Mitchell, Scott Williams, Prue Allan, Peter MacCallum Cancer Ctr. (Australia); Annette Haworth, Peter MacCallum Cancer Ctr. (Australia) and The Univ. of Melbourne (Australia) . . . . . .[9420-21]

Nucleus detection using gradient orientation information and linear least squares regression, Jin Tae Kwak, National Institutes of Health (USA); Stephen M. Hewitt, National Cancer Institute (USA); Sheng Xu, National Institutes of Health (USA); Peter A. Pinto, National Cancer Institute (USA); Bradford J. Wood, National Institutes of Health (USA) . . . . . .[9420-22]

Toward consistent cell segmentation: quality assessment of cell segments via appearance and geometry features, Andrew Brinker, Annika Fredrikson, Xiaofan Zhang, Richard Sourvenir, Shaoting Zhang, The Univ. of North Carolina at Charlotte (USA) . . . . . .[9420-23]

Adaptive whole slide tissue segmentation to handle inter-slide tissue variability, Kien T. Nguyen, Ting Chen, Joerg Bredno, Chukka Srinivas, Christophe Chefd'hotel, Ventana Medical Systems, Inc. (USA); Solange Romagnoli, Astrid Heller, Oliver Grimm, Fabien Gaire, Roche Diagnostics GmbH (Germany) . . . . [9420-24]

A novel spectral imaging system for use during pancreatic cancer surgery, Joseph A. Peller, Susan R. Trammell, Mehrdad Abolbashari, Faramarz Farahi, The Univ. of North Carolina at Charlotte (USA) . . . . . .[9420-25]

Detection of high-grade atypia nuclei in breast cancer imaging, Henri Noel, IPAL CNRS (Singapore) and UPMC (Singapore); Ludovic Roux, IPAL, CNRS (Singapore) and Univ. Joseph Fourier (France); Shijian Lu, IPAL, CNRS (Singapore) and Institute for Infocomm Research (Singapore); Thomas Boudier, IPAL, CNRS (Singapore) and UPMC (Singapore) and Bioinformatics Institute (Singapore) . . . . . .[9420-26]

A novel texture descriptor for detection of glandular structures in colon histology images, Korsuk Sirinukunwattana, The Univ. of Warwick (UK); David Snead, Univ. Hospitals Coventry and Warwickshire NHS Trust (UK); Nasir M. Rajpoot, Qatar Univ. (Qatar) and The Univ. of Warwick (UK) . .[9420-27]

A circumscribing active contour model for delineation of nuclei and membranes of megakaryocytes in bone marrow trephine biopsy images, Tzu-Hsi Song, Victor Sanchez, The Univ. of Warwick (UK); Hesham Eldaly, Haematology Oncology Diagnostic Service, Addenbrooke's Hospital (UK); Nasir M. Rajpoot, The Univ. of Warwick (UK) and Qatar Univ. (Qatar) . . . . . .[9420-28]

Success of digitizing the Dept. of Pathology: Is it just to change the technical platform and go with the slide-scanners or do we need a paradigm when it comes to informatics and workflow?, Mikael Wintell, Sahlgrenska Univ. Hospital (Sweden); Lars Lindsköld, Bo Samulesson, Elisabeth Wehlander, Västra Götaland (Sweden) . . . . . .[9420-29]

Uncertainty in the assessment of immunohistochemical staining with optical and digital microscopy: lessons from a reader study, Marios A. Gavrielides, Brandon Gallas, U.S. Food and Drug Administration (USA); Stephen M. Hewitt, National Cancer Institute (USA) . . . . . .[9420-30]

Improved segmentation of abnormal cervical nuclei using a graph-search based approach, Ling Zhang, The Univ. of Iowa (USA); Shaoxiong Liu M.D., Peoples Hospital of Nanshan District (China); Tianfu Wang, Siping Chen, Shenzhen Univ. (China); Milan Sonka, The Univ. of Iowa (USA) . . . . . .[9420-31]

An automated approach to improve the efficacy in detecting residual cancer cell for facilitating prognostic assessment of leukemia: an initial study, Yuchen Qiu, The Univ. of Oklahoma (USA); Xianglan Lu, The Univ. of Oklahoma Health Sciences Ctr. (USA); Maxine Tan, The Univ. of Oklahoma (USA); Shibo Li, The Univ. of Oklahoma Health Sciences Ctr. (USA); Hong Liu, Bin Zheng, The Univ. of Oklahoma (USA) . . . . . .[9420-32]

An accurate method of extracting fat droplets in liver images for quantitative evaluation, Masahiro Ishikawa, Naoki Kobayashi, Hideki Komagata, Kazuma Shinoda, Saitama Medical Univ. (Japan); Masahiro Yamaguchi, Tokyo Institute of Technology (Japan); Tokiya Abe, Akinori Hashiguchi, Michiie Sakamoto, Keio Univ. (Japan). . . . . .[9420-33]

Multi-stained whole slide image alignment in digital pathology, Gloria Bueno, Oscar Deniz, Univ. de Castilla-La Mancha (Spain); David Toomey, Catherine Conway, Leica Biosystems (Ireland) . . . . . .[9420-35]

Automatic choroid cells segmentation and counting based on approximate convexity and concavity of chain code in fluorescence microscopic image, Weihua Lu, Xinjian Chen, Weifang Zhu, Lei Yang, Zhaoyuan Cao, Soochow Univ. (China); Haoyu Chen, Joint Shantou International Eye Center of Shantou University and The Chinese University of Hong Kong (China) . . . . . .[9420-36]

Detecting cells in time varying intensity images in confocal microscopy for gene expression studies in living cells, Debasis Mitra, Florida Institute of Technology (USA); Rostyslav Boutchko, Lawrence Berkeley National Lab. (USA); Judhajeet Roy, Marit Nilsen-Hamilton, Iowa State Univ. (USA) . . . . . .[9420-37]

WEDNESDAY 25 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 12
Room: Crystal C . . . . Wed 8:00 am to 9:40 am

Performance Evaluation

Session Chairs: **Joseph Y. Lo,** Duke Univ. School of Medicine (USA); **Wei Zhao,** Stony Brook Medicine (USA)

8:00 am: **Evaluation of a video-based head motion tracking system for dedicated brain PET**, Sergey Anishchenko, Univ. of Maryland, Baltimore (USA) and A.B. Kogan Research Institute for Neurocybernetics, Southern Federal Univ. (Russian Federation); David M. Beylin, Pavel S. Stepanov, Brain Biosciences Inc. (USA); Alex Stepanov, Brain Biosciences, Inc. (USA); Irving N. Weinberg, Stephen Schaeffer, Brain Biosciences Inc. (USA); Valery Zavarzin, Brain Biosciences (USA); Dmitry G. Shaposhnikov, A.B. Kogan Research Institute for Neurocybernetics, Southern Federal Univ. (Russian Federation); Mark F. Smith, Univ. of Maryland, Baltimore (USA). . . . . [9412-58]

8:20 am: **Computation of synthetic mammograms with an edge-weighting algorithm**, Klaus Erhard, Hanno Homann, Frank Bergner, Philips Research (Germany) . . . . . [9412-59]

8:40 am: **Lesion insertion in projection domain for CT image quality assessment**, Baiyu Chen, Zhicong Yu, Shuai Leng, Lifeng Yu, Cynthia H. McCollough, Mayo Clinic (USA). . [9412-60]

9:00 am: **Examining wide-arc digital breast tomosynthesis: optimization using a visual-search model observer**, Mini Das, Zhihua Liang, Howard C. Gifford, Univ. of Houston (USA). . . . . [9412-61]

9:20 am: **Performance comparison of breast imaging modalities using a 4AFC human observer study**, Premkumar Elangovan, Univ. of Surrey (UK); Alaleh Rashidnasab, Univ. of Surrey (UK) and Univ. Hospitals Leuven (Belgium); Alistair Mackenzie, David R. Dance, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Hilde Bosans, Univ. Hospitals Leuven (Belgium); William P. Segars, Duke Univ. (USA); Kevin Wells, Univ. of Surrey (UK) . . . . . [9412-62]

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

9412 continues on page 54

CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 5
Room: Crystal E . . . . Wed 8:00 am to 9:40 am

Machine Learning

Session Chairs: **Kensaku Mori,** Nagoya Univ. (Japan); **Ivana Isgum,** Univ. Medical Ctr. Utrecht (Netherlands)

8:00 am: **Revealing latent value of clinically acquired CTs of traumatic brain injury through multi-atlas segmentation in a retrospective study of 2,219 subjects**, Andrew J. Plassard, Patrick D. Kelly, Andrew J. Asman, Hakmook Kang, Mayur B. Patel, Bennett A. Landman, Vanderbilt Univ. (USA). [9413-19]

8:20 am: **Efficient abdominal segmentation on clinically acquired CT with SIMPLE context learning**, Zhoubing Xu, Ryan P. Burke, Christopher P. Lee, Rebeccah B. Baucom, Benjamin K. Poulose, Richard G. Abramson, Bennett A. Landman, Vanderbilt Univ. (USA). [9413-20]

8:40 am: **Longitudinal graph-based segmentation of macular OCT using fundus alignment**, Andrew Lang, Aaron Carass, Omar Al-Louzi, Pavan Bhargava, Howard S. Ying, Peter A. Calabresi, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9413-21]

9:00 am: **Machine learning for the automatic localisation of foetal body parts in cine-MRI scans**, Chris J. Bowles, Niamh Nowlan, Imperial College London (UK); Tayyib T. A. Hayat, Christina Malamateniou, King's College London (UK); Mary A. Rutherford, Imperial College London (UK); Joseph V. Hajnal, King's College London (UK); Daniel Rueckert, Bernhard Kainz, Imperial College London (UK) . . . . . [9413-22]

9:20 am: **MS lesion segmentation using a multi-channel patch-based approach with spatial consistency**, Roey Mechrez, Tel Aviv Univ. (Israel); Jacob Goldberger, Bar-Ilan Univ. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel). . . . . [9413-23]

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

9413 continues on page 54

CONFERENCE 9414
Computer-Aided Diagnosis
Rooms: Crystal D

SESSION 12
Room: Crystal D . . . . Wed 8:00 am to 9:40 am

Lung and Chest II

Session Chairs: **Nico Karssemeijer,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Samuel G. Armato III,** The Univ. of Chicago (USA)

8:00 am: **Reducing annotation cost and uncertainty in computer-aided diagnosis through selective iterative classification**, Amelia R. Riely, The Univ. of North Carolina at Chapel Hill (USA); Kyle J. Sablan, San Diego State Univ. (USA); Thomas Xiaotao, Jacob D. Furst, Daniela S. Raicu, DePaul Univ. (USA) . . . . [9414-55]

8:20 am: **A computer-aided diagnosis system to identify regions of pathologic change in temporal subtraction images of the chest**, Charles Ho, Rice Univ. (USA); Katherine Lee, Purdue Univ. (USA); Samuel G. Armato III, The Univ. of Chicago (USA) . . . . . [9414-56]

8:40 am: **Exploring new quantitative CT image features to improve assessment of lung cancer prognosis**, Nastaran Emaminejad, Univ. of Oklahoma (USA); Wei Qian, The Univ. of Texas at El Paso (USA); Yan Kang, Northeastern Univ. (China); Yubao Guan, Guangzhou Medical College (China); Fleming Lure, Univ. of Texas (USA); Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9414-57]

9:00 am: **Nonlinear dimensionality reduction of CT histogram based feature space for predicting recurrence-free survival in non-small-cell lung cancer**, Yoshiki Kawata, Noboru Niki, Univ. of Tokushima (Japan); Hironobu Ohamatsu, 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). . . . . [9414-58]

9:20 am: **Computer-aided detection of lung cancer: combining pulmonary nodule detection systems with a tumor risk prediction model**, Arnaud Arindra Adiyoso Setio, Colin Jacobs, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Francesco Ciompi, Radboud Univ. Nijmegen (Netherlands); Sarah J. van Riel, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Mathilde M. Winkler Wille, Asger Dirksen, Gentofte Hospital (Denmark); Eva M. van Rikxoort, Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9414-59]

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

9414 continues on page 54

CONFERENCE 9416
Image Perception, Observer Performance, and Technology Assessment
Room: Oceans 4

SESSION 1
Room: Oceans 4 . . . . Wed 8:00 am to 9:40 am

Keynote and Breast I

Session Chairs: **Claudia R. Mello-Thoms,** The Univ. of Sydney (Australia), Univ. of Pittsburgh {USA); **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (USA)

8:00 am: **I am a breast imager; you are a visual scientist. Let's dance and make a better a Radiologist.** *(Keynote Presentation)*, Dianne Georgian-Smith, Brigham and Women's Hospital (USA) . . . . . [9416-1]

9:00 am: **Incorporating breast tomosynthesis into radiology residency: Does trainee experience in breast imaging translate into improved performance with the new modality?**, Lars J. Grimm, Duke Univ. (USA); Jing Zhang, Duke Univ. Medical Ctr. (USA); Karen Johnson, Duke Univ. (USA); Joseph Y. Lo, Duke Univ. School of Medicine (USA); Maciej A. Mazurowski, Duke Univ. (USA) . . . . . [9416-2]

9:20 am: **Detection of calcification clusters in digital breast tomosynthesis slices at different dose levels utilizing SRSAR reconstruction and JAFROC**, Pontus A. Timberg, Scanias Univ. Hospital (Sweden) and Lund Univ. (Sweden); Magnus Dustler, Scanias Univ. Hospital (Sweden); Hannie Petersson, Scanias Univ. Hospital (Sweden); Anders Tingberg, Sophia Zackrisson, Scanias Univ. Hospital (Sweden) . . . . . [9416-3]

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

9416 continues on page 54

CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Oceans 2

SESSION 3
Room: Oceans 2 . . . . Wed 8:00 am to 9:40 am

Novel MR Techniques and Applications

Session Chairs: **Barjor Gimi,** Geisel School of Medicine (USA); **Vikram D. Kodibagkar,** Arizona State Univ. (USA)

8:00 am: **A Bloch-McConnell simulator with pharmacokinetic modeling to explore accuracy and reproducibility in the measurement of hyperpolarized Pyruvate**, Christopher M. Walker, James A. Bankson, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA) . . . . [9417-10]

8:20 am: **Fat-water MRI is sensitive to local adipose tissue inflammatory changes in a diet-induced obesity mouse model at 15T**, Henry H. Ong, Vanderbilt Univ. (USA); Corey Web, Marnie L. Broderick, Alyssa Hasty, Vanderbilt Univ. School of Medicine (USA); John C. Gore, Vanderbilt Univ. Medical Ctr. (USA); Edward B. Welch, Vanderbilt Univ. (USA) . [9417-11]

8:40 am: **Susceptibility weighted imaging of stroke brain in response to normobaric oxygen (NBO) therapy**, Iris Y. Zhou, Phillip Z. Sun, Takahiro Igarashi, Yingkun Guo, Massachusetts General Hospital (USA) . . . . . [9417-12]

9:00 am: **Quantification of in vivo pH-weighted amide proton transfer (APT) MRI in acute ischemic stroke**, Phillip Z. Sun, Iris Y. Zhou, Takahiro Igarashi, Yingkun Guo, Massachusetts General Hospital (USA) and Harvard Medical School (USA). . . . . [9417-13]

9:20 am: **A rapid Look-Locker imaging sequence for quantitative tissue oximetry**, Rohini Vidya Shankar, Vikram D. Kodibagkar, Arizona State Univ. (USA) . . . . . [9417-14]

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

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WEDNESDAY 25 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging

Room: Crystal C

SESSION 13
Room: Crystal C . . Wed 10:10 am to 12:10 pm

X-Ray Imaging

Session Chairs: **Rebecca Fahrig,** Stanford School of Medicine (USA); **Mini Das,** Univ. of Houston (USA)

10:10 am: **X-ray attenuation of adipose breast tissue: in-vitro and in-vivo measurements using spectral imaging**, Erik Fredenberg, Philips Healthcare (Sweden); Klaus Erhard, Philips Research (Germany); Karl Berggren, Philips Healthcare (Sweden); David R. Dance, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Björn Cederström, Henrik Johansson, Mats Lundqvist, Elin Moa, Philips Healthcare (Sweden); Hanno Homann, Philips Research (Germany); Paula Willsher, Fleur Kilburn-Toppin, Cambridge Breast Unit (UK) and NIHR Cambridge Biomedical Research Ctr. (UK); Matthew G. Wallis, Cambridge Breast Unit (UK) and NIHR Cambridge Biomedical Research Ctr. (UK) . . . . . [9412-63]

10:30 am: **A method for the production of customized epoxy resin x-ray filters for use within the bore of gantry-based micro-CT scanners**, Justin J. Tse, Joy Dunmore-Buyze, Maria Drangova, David W. Holdsworth, The Univ. of Western Ontario (Canada). . . . . [9412-64]

10:50 am: **Detector, collimator and real-time reconstructor for a new scanning-beam digital x-ray (SBDX) prototype**, Michael A. Speidel, Michael T. Tomkowiak, Amish N. Raval, David A. P. Dunkerley, Jordan M. Slagowski, Univ. of Wisconsin-Madison (USA); Paul Kahn, Chwen-Yuan Ku, Tobias Funk, Triple Ring Technologies, Inc. (USA) . . . . . [9412-65]

11:10 am: **Electronic versus mechanical phase stepping in phase-contrast x-ray imaging**, Katherine Harmon, Houxun Miao, Andrew A. Gomella, Eric E. Bennett, Alirexa Panna, Harold H. Wen, National Institutes of Health (USA) . . . . . [9412-66]

11:30 am: **Digital breast tomosynthesis with minimal breast compression**, David A. Scaduto, Min Yang, Wei Zhao, Stony Brook Univ. (USA) . . . . . [9412-67]

11:50 am: **A dual-detector fluoroscopy system for interventional radiology**, Christopher W. Ellenor, Paul Kahn, Oleg J. Konings, Chwen-Yuan Ku, Triple Ring Technologies, Inc. (USA); Rebecca Fahrig, Stanford Univ. (USA); Tobias Funk, Triple Ring Technologies, Inc. (USA) . . . [9412-68]

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

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CONFERENCE 9413
Image Processing

Rooms: Crystal E

SESSION 6
Room: Crystal E . . Wed 10:10 am to 12:10 pm

Shape and Models

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

10:10 am: **Automatic sulcal curve extraction on the human cortical surface**, Ilwoo Lyu, Sun Hyung Kim, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9413-24]

10:30 am: **Adaptation of an articulated fetal skeleton model to three-dimensional fetal image data**, Tobias Klinder, Philips Research (Germany); Hannes Wendland, Univ. zu Lübeck (Germany); Irina Waechter-Stehle, Philips Research (Germany); David Roundhill, Philips Healthcare (USA); Cristian Lorenz, Philips Research (Germany) . . . . [9413-25]

10:50 am: **Interpretable exemplar-based shape classification using constrained sparse linear models**, Gunnar A. Sigurdsson, Zhen Yang, Trac D. Tran, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9413-26]

11:10 am: **Reference geometry-based detection of (4D-)CT motion artifacts: a feasibility study**, René Werner, Tobias Gauer, Univ. Medical Ctr. Hamburg-Eppendorf (Germany) . . . . . [9413-27]

11:30 am: **Hierarchical pictorial structures for simultaneously localizing multiple organs in volumetric pre-scan CT**, Qi Song, Albert Montillo, GE Global Research (USA); Bipul Das, GE India Technology Centre Pvt. Ltd. (India); Zhye Yin, GE Global Research (USA) . . [9413-28]

11:50 am: **Skeletal shape correspondence via entropy minimization**, Liyun Tu, The Univ. of North Carolina at Chapel Hill (USA) and Chongqing Univ. (China); Martin A. Styner, Jared Vicory, Beatriz Paniagua, The Univ. of North Carolina at Chapel Hill (USA); Juan Carlos Prieto, Brigham and Women's Hospital, Ctr. of Neurological Imaging (USA); Dan Yang, Chongqing Univ. (China); Stephen M. Pizer, The Univ. of North Carolina at Chapel Hill (USA) . . . . [9413-29]

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

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CONFERENCE 9414
Computer-Aided Diagnosis

Rooms: Crystal D

SESSION 13
Room: Crystal D . . Wed 10:10 am to 12:10 pm

Multi-Organ

Session Chairs: **Nicholas A. Petrick,** U.S. Food and Drug Administration (USA); **Carol L. Novak,** Siemens Corp., Corporate Technology (USA)

10:10 am: **Pneumothorax detection in chest radiographs using local and global texture signatures**, Ofer Geva, Gali Zimmerman Moreno, Tel Aviv Univ. (Israel); Sivan Lieberman, Eli Konen, Sheba Medical Ctr. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel). . . . . [9414-60]

10:30 am: **Computer-aided detection of bladder mass within contrast-enhanced region of CTU**, Kenny H. Cha, Lubomir M. Hadjiiski, Heang-Ping Chan, Elaine M. Caoili, Richard H. Cohan, Chuan Zhou, Univ. of Michigan (USA) . . . . . [9414-61]

10:50 am: **Automatic identification of IASLC-defined mediastinal lymph node stations on CT scans using multi-atlas organ segmentation**, Joanne Hoffman, Jiamin Liu, Evrim B. Turkbey, Lauren Kim, Ronald M. Summers, National Institutes of Health (USA) . . . . . [9414-62]

11:10 am: **Ureter segmentation in CT urography (CTU) by COMPASS with multiscale Hessian enhancement**, Duncan Fairbanks, Univ. of Michigan (USA); Lubomir M. Hadjiiski, Heang-Ping Chan, Chuan Zhou, Univ. of Michigan Health System (USA); Richard H. Cohen, Univ. of Michigan (USA); Elaine M. Caoili, Kenny H. Cha, Univ. of Michigan Health System (USA) . . . . . [9414-63]

11:30 am: **Automated branching pattern report generation for laparoscopic surgery assistance**, Masahiro Oda, Tetsuro Matsuzaki, Yuichiro Hayashi, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazunari Misawa, Aichi Cancer Ctr. Research Institute (Japan); Kensaku Mori, Nagoya Univ. (Japan) . . . . . [9414-64]

11:50 am: **Prediction of treatment outcome in soft tissue sarcoma based on radiologically defined habitats**, Hamidreza Farhidzadeh, Baishali Chaudhury, Mu Zhou, 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) . . [9414-65]

CONFERENCE 9414 ENDS

CONFERENCE 9416
Image Perception, Observer Performance, and Technology Assessment

Room: Oceans 4

SESSION 2
Room: Oceans 4 . . Wed 10:10 am to 12:10 pm

Breast II

Session Chair: **Patrick C. Brennan,** The Univ. of Sydney (Australia)

10:10 am: **Inter- and intra-observer variations in the delineation of sesions in mammograms**, Thomas Buelow, Harald S. Heese, Ruediger Grewer, Dominik Kutra, Rafael Wiemker, Philips Research (Germany) . . . . . [9416-4]

10:30 am: **Computational assessment of mammography accreditation phantom images and correlation with human observer analysis**, Bruno Barufaldi, Univ. de São Paulo (Brazil) and Univ. of Pennsylvania (USA); Kristen C. Lau, Univ. of Pennsylvania (USA); Homero Schiabel, Univ. de São Paulo (Brazil); Andrew D. A. Maidment, Univ. of Pennsylvania (USA) . . . . . [9416-5]

10:50 am: **iDensity: an automatic Gabor filter-based algorithm for breast density assessment**, Ziba Gamdonkar, William J. Ryder, Kevin Tay, Patrick C. Brennan, Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) . . . . . [9416-6]

11:10 am: **Assessment of mass detection performance in contrast enhanced digital mammography**, Ann-Katherine Carton, GE Healthcare France (France); Zhijin Li, GE Healthcare France (France) and Ecole Normale Supérieure de Cachan (France); Clarisse Dromain, Institut Gustave Roussy (France); Serge L. Muller, GE Healthcare France (France) . . . [9416-7]

11:30 am: **The relationship between socio-economic status and cancer detection at screening**, Sian Taylor-Phillips, Toyin Ogboye, Tom Hamborg, The Univ. of Warwick (UK); Olive Kearins, Emma O'Sullivan, West Midlands Quality Assurance Reference Ctr., Public Health England (UK); Aileen Clarke, The Univ. of Warwick (UK) . . . . . [9416-8]

11:50 am: **The impact of mammographic imaging systems on density measurement**, Christine N. Damases, Mark F. McEntee, The Univ. of Sydney (Australia) . . . . . [9416-9]

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

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CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 4
Room: Oceans 2 . . Wed 10:10 am to 12:10 pm

Keynote and Neurological Imaging

Session Chairs: **Barjor Gimi,** Geisel School of Medicine (USA); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA)

10:10 am: **The rapid imaging renaissance: sparser samples, denser dimensions, and glimmerings of a grand unified tomography** *(Keynote Presentation)*, Daniel K. Sodickson, New York Univ. School of Medicine (USA) . . . . . [9417-15]

11:10 am: **Structured illumination multispectral optical imaging to assess brain function in a mouse model of focal traumatic brain injury**, David Abookasis, Boris Volkov, Ariel Univ. (Israel) . . [9417-16]

11:30 am: **Predicting stroke outcome using DCE-CT measured blood velocity**, Jaap Oosterbroek, Edwin Bennink, Jan Willem Dankbaar, Alexander D. Horsch, Max A. Viergever, Birgitta K. Velthuis, Hugo W. A. M. de Jong, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [9417-17]

11:50 am: **Marker-less multi-frame motion tracking and compensation in PET-brain imaging**, Clifford Lindsay, Joyeeta M. Mukherjee, Karen Johnson, Univ. of Massachusetts Medical School (USA); Patrick Olivier, Xiyun Song, Ling-Xiong Shao, Philips Healthcare (USA); Michael A. King, Univ. of Massachusetts Medical School (USA). . . . . [9417-18]

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

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WEDNESDAY 25 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 14
Room: Crystal C . . . . Wed 1:20 pm to 3:00 pm

Computed Tomography II

Session Chairs: **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Thomas G. Flohr,** Siemens AG (Germany)

1:20 pm: **Task-driven imaging in cone-beam computed tomography**, Grace J. Gang, Joseph W. Stayman, Sarah Ouadah, Johns Hopkins Univ. (USA); Tina Ehtiati, Siemens Healthcare (USA); Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9412-69]

1:40 pm: **The rotate-plus-shift C-arm trajectory: complete CT data with limited angular rotation**, Ludwig Ritschl, Ziehm Imaging GmbH (Germany); Jan Kuntz, Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) . . . . . [9412-70]

2:00 pm: **Simultaneous imaging of multiple contrast agents using full-spectrum micro-CT**, Darin P. Clark, Ctr. for In Vivo Microscopy (USA); Mengheng Touch, Medical Physics, Duke University (USA); William C. Barber, DxRay, Inc. (USA); Cristian T. Badea, Ctr. for In Vivo Microscopy (USA). . . . . [9412-71]

2:20 pm: **Spectral deblurring: an algorithm for high-resolution, hybrid spectral CT**, Darin P. Clark, Cristian T. Badea, Ctr. for In Vivo Microscopy (USA) . . . . . [9412-72]

2:40 pm: **Performance comparison between static and dynamic cardiac CT on perfusion quantitation and patient classification tasks**, Michael D. Bindschadler, Univ. of Washington (USA); Dimple Modgil, The Univ. of Chicago (USA); Kelley R. Branch, Univ. of Washington (USA); Patrick J. La Rivière, The Univ. of Chicago (USA); Adam M. Alessio, Univ. of Washington (USA). . . . . [9412-73]

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

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CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 7
Room: Crystal E . . . . Wed 1:20 pm to 3:00 pm

Computational Anatomy

Session Chairs: **James C. Gee,** Univ. of Pennsylvania (USA); **Bennett A. Landman,** Vanderbilt Univ. (USA)

1:20 pm: **Probabilistic atlas based labeling of the cerebral vessel tree**, Martijn Van de Giessen, Leiden Univ. Medical Ctr. (Netherlands) and Technische Univ. Delft (Netherlands); Jasper P. Janssen, Patrick A. Brouwer, Johan H. C. Reiber, Leiden Univ. Medical Ctr. (Netherlands); Boudewijn P. F. Lelieveldt, Leiden Univ. Medical Ctr. (Netherlands) and Technische Univ. Delft (Netherlands); Jouke Dijkstra, Leiden Univ. Medical Ctr. (Netherlands). . . . . [9413-30]

1:40 pm: **Simultaneous skull-stripping and lateral ventricle segmentation via fast multi-atlas likelihood-fusion**, Xiaoying Tang, Kwame Kutten, Can Ceritoglu, Susumu Mori, Michael I. Miller, Johns Hopkins Univ. (USA) . . . . . [9413-31]

2:00 pm: **A transformation similarity constraint for groupwise nonlinear registration in longitudinal neuro imaging studies**, Greg M. Fleishman, Imaging Genetics Ctr., The Univ. of Southern California (USA) and Univ. of California, Los Angeles (USA); Boris Gutman, Imaging Genetics Ctr., The Univ. of Southern California (USA); P. Thomas Fletcher, Scientific Computing and Imaging Institute (USA) and The Univ. of Utah (USA); Paul M. Thompson, Imaging Genetics Ctr., The Univ. of Southern California (USA) . . . . . [9413-32]

2:20 pm: **Automatic brain extraction in fetal MRI using multi-atlas-based segmentation**, Sébastien Tourbier, Ctr. d'Imagerie BioMédicale (Switzerland) and Ctr. Hospitalier Univ. Vaudois (Switzerland) and Univ. de Lausanne (Switzerland); Patric Hagmann, Ctr. Hospitalier Univ. Vaudois (Switzerland) and Univ. de Lausanne (Switzerland); Maud Cagneaux, Hôpital Femme-Mère-Enfant (France); Laurent Guibaud, Hôpital Femme Mère Enfant (France); Subrahmanyam Gorthi, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Marie Schaer, Univ. de Genève (Switzerland); Jean-Philippe Thiran, Ctr. Hospitalier Univ. Vaudois (Switzerland) and Univ. de Lausanne (Switzerland) and Ecole Polytechnique Fédérale de Lausanne (Switzerland); Reto Meuli, Ctr. Hospitalier Univ. Vaudois (Switzerland) and Univ. de Genève (Switzerland); Meritxell Bach Cuadra, Ctr. d'Imagerie BioMédicale (Switzerland) and Ctr. Hospitalier Univ. Vaudois (Switzerland) and Univ. de Lausanne (Switzerland) . . . . . [9413-33]

CONFERENCE 9416
Image Perception, Observer Performance, and Technology Assessment
Room: Oceans 4

SESSION 3
Room: Oceans 4 . . . . Wed 1:20 pm to 3:00 pm

Observer Performance Evaluation

Session Chair: **Elizabeth A. Krupinski,** The Univ. of Arizona (USA)

1:20 pm: **A phantom-based JAFROC observer study of two CT reconstruction methods: the search for optimisation of lesion detection and effective dose**, John D. Thompson, Univ. of Salford (UK) and University Hospitals of Morecambe Bay NHS Foundation Trust (UK); Dev P. Chakraborty, Univ. of Pittsburgh (USA); Katy R. Szczepura, Univ. of Salford (UK); Ioannis Vamvakas, The Christie NHS Foundation Trust (UK); Andrew Tootell, Univ. of Salford (UK); David J. Manning, Lancaster Univ. (UK); Peter Hogg, Univ. of Salford (UK) . . . . . [9416-10]

1:40 pm: **ROC curve estimation using two alternative binary classification**, Francesc Massanes, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . . [9416-11]

2:00 pm: **A multireader diagnostic performance study of low-contrast detectability on a third-generation dual-source CT scanner: filtered back projection versus advanced modeled iterative reconstruction**, Justin B. Solomon, Achille Mileto, Duke Univ. School of Medicine (USA); Juan Carlos R. Giraldo, Siemens Medical Solutions USA, Inc. (USA); Ehsan Samei, Duke Univ. School of Medicine (USA) . . . . . [9416-12]

2:20 pm: **Demonstration of multi- and single-reader sample size program for diagnostic studies software**, Stephen L. Hillis, Kevin M. Schartz, The Univ. of Iowa (USA) . . . . . [9416-13]

2:40 pm: **Low contrast detectability in CT for human and model observer in multi-slice data sets**, Alexandre BA, Institut Univ de Radiophysique Appliquee (Switzerland); Damien Racine, Ctr. Hospitalier Univ. Vaudois (Switzerland); Julien G. Ott, Institut Univ. de Radiophysique Appliquée (Switzerland) and Lausanne Univ. Hopsital (Switzerland); Francis R. Verdun, Sabine Kobbe-Schmidt, Ctr. Hospitalier Univ. Vaudois (Switzerland); Miguel P. Eckstein, Univ. of California, Santa Barbara (USA); François O. Bochud, Ctr. Hospitalier Univ. Vaudois (Switzerland) . . . . . [9416-14]

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

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2:40 pm: **Automatic parcellation of longitudinal cortical surfaces**, Manal H. Alassaf, James K. Hahn, The George Washington Univ. (USA) and Institute for Biomedical Computing (USA) . . . [9413-34]

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

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CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Oceans 2

SESSION 5
Room: Oceans 2 . . . . Wed 1:20 pm to 3:20 pm

fMRI

Session Chairs: **Barjor Gimi,** Geisel School of Medicine (USA); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA)

1:20 pm: **Towards an automated selection of spontaneous co-activity maps in functional magnetic resonance imaging**, Marion Sourty, Laurent Thoraval, Daniel Roquet, Jean-Paul Armspach, Univ. de Strasbourg (France); Jack Foucher, Univ. de Strasbourg (France) and Hôpitaux Univ. de Strasbourg (France) . . . . [9417-19]

1:40 pm: **Cortical activities of single-trial P300 amplitudes modulated by memory load using simultaneous EEG-fMRI**, Qiushi Zhang, Xiaojie Zhao, Li Yao, Beijing Normal Univ. (China). . . . . [9417-20]

2:00 pm: **Nonlinear functional connectivity network recovery in the human brain with mutual connectivity analysis (MCA): convergent cross-mapping and non-metric clustering**, Axel Wismüller, Univ. of Rochester Medical Ctr. (USA); Anas Z Abidin, Univ of Rochester Medical Ctr (USA); Adora M. D'Souza, Xixi Wang, Susan K. Hobbs, Univ. of Rochester Medical Ctr. (USA); Lutz Leistritz, Institute of Medical Statistics, Computer Sciences, and Documentation, Friedrich Schiller University (Germany); Mahesh B. Nagarajan, Univ. of Rochester Medical Ctr. (USA) . . . . . [9417-21]

2:20 pm: **Comparing consistency of R2* and T2*-weighted BOLD analysis of resting state fetal fMRI**, Sharmishtaa Seshamani, Ania Blazejewska, Christopher Gatenby, Susan Mckown, Jason Caucutt, Manjiri Dighe, Colin Studholme, Univ. of Washington (USA). . . . . [9417-22]

2:40 pm: **Robust motion correction and outlier rejection of in vivo functional MR images of the fetal brain and placenta during maternal hyperoxia**, Wonsang You, Ahmed Serag, Children's National Medical Ctr. (USA); Iordanis E. Evangelou, Children's National Medical Ctr. (USA) and George Washington Univ. (USA); Nickie Niforatos-Andescavage, Children's National Medical Ctr. (USA); Catherine Limperopoulos, Children's National Medical Ctr. (USA) and George Washington Univ. (USA) . . . . . [9417-23]

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

9417 continues on page 56

CONFERENCE 9420
Digital Pathology
Room: Crystal D

SESSION 1
Room: Crystal D . . . . Wed 1:20 pm 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: **Twenty years of image-based search technology in review: bright prospects for image-based search and decision support in whole slide imaging** *(Keynote Presentation)*, Ulysses J. Balis, Univ. of Michigan Health System (USA) [9420-1]

2:20 pm: **Segmentation of digitized histological sections for vasculature quantification in the mouse hind limb**, Yiwen Xu, The Univ. of Western Ontario (Canada); J. Geoffery Pickering, Zengxuan Nong, Robarts Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada). . . . . [9420-2]

2:40 pm: **Structure preserving color deconvolution for immunohistochemistry images**, Ting Chen, Chukka Srinivas, Ventana Medical Systems, Inc. (USA) . . . . [9420-3]

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

NOTE: TUESDAY WORKSHOP

WORKSHOP

Power of pathology: predicting disease aggressiveness from tissue slides

Room: Crystal C · Tue 5:00 pm to 7:00 pm

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

See Special Events for additional information.

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WEDNESDAY 25 FEBRUARY

CONFERENCE 9412
Physics of Medical Imaging
Room: Crystal C

SESSION 15
Room: Crystal C . . . . Wed 3:30 pm to 5:30 pm

Tomosynthesis

Session Chairs: **Despina Kontos,** The Univ. of Pennsylvania Health System (USA); **Anders Tingberg,** Lund Univ. (Sweden)

3:30 pm: **Data truncation in multi-contrast tomosynthesis image reconstructions**, John W. Garrett, Yongshuai Ge, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9412-74]

3:50 pm: **Feasibility study of the diagnosis and monitoring of cystic fibrosis in pediatric patients using stationary digital chest tomosynthesis**, Marci Potuzko, Jing Shan, Caleb Pearce, Yueh Z. Lee, Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9412-75]

4:10 pm: **Segmentation methods for breast vasculature in dual-energy contrast-enhanced digital breast tomosynthesis**, Kristen C. Lau, Tanushriya Singh, Hyo Min Lee, Andrew D. A. Maidment, The Univ. of Pennsylvania Health System (USA) . . . . . [9412-76]

4:30 pm: **Initial clinical evaluation of stationary digital breast tomosynthesis**, Jabari Calliste, Andrew W. Tucker, Emily Gidcumb, Cherie M. Kuzmiak, Jianping Lu, Otto Zhou, Yueh Z. Lee, The Univ. of North Carolina at Chapel Hill (USA) . . . . [9412-77]

4:50 pm: **The impact of breast structure on lesion detection in breast tomosynthesis**, Nooshin Kiarashi, Loren W. Nolte, Duke Univ. (USA); Joseph Y. Lo, William P. Segars, Sujata V. Ghate, Ehsan Samei, Duke Univ. School of Medicine (USA) . . . . . [9412-78]

5:10 pm: **Circular tomosynthesis for neuro perfusion imaging on an interventional C-arm**, Bernhard E. H. Claus, David A. Langan, Omar Al Assad, Xin Wang, GE Global Research (USA) . . . . . .[9412-79]]

CONFERENCE 9412 ENDS

CONFERENCE 9413
Image Processing
Rooms: Crystal E

SESSION 8
Room: Crystal E . . . . Wed 3:30 pm to 5:30 pm

Segmentation: Brain

Session Chairs: **Koen Van Leemput,** Massachusetts General Hospital (USA); **Marleen de Bruijne,** Erasmus MC (Netherlands)

3:30 pm: **3D MR ventricle segmentation in pre-term Infants with post-hemorrhagic ventricle dilation**, Wu Qiu, Jing Yuan, Jessica Kishimoto, Robarts Research Institute (Canada); Yimin Chen, City Univ. of Hong Kong (China); Sandrine de Ribaupierre, Robarts Research Institute (Canada); Bernard Chiu, City University of Hong Kong (China); Aaron Fenster, Robarts Research Institute (Canada). . . . .[9413-35]

3:50 pm: **Automatic tissue segmentation of neonate brain MR Images with subject-specific atlases**, Marie Cherel, Francois Budin, The Univ. of North Carolina at Chapel Hill (USA); Marcel Prastawa, GE Global Research (USA); Guido Gerig, The Univ. of Utah (USA); Kevin Lee, The Univ. of North Carolina at Chapel Hill (USA); Claudia Buss, Charité Univ. Medicine Berlin (Germany) and Univ. of California, Irvine (USA); Amanda E. Lyall, Harvard Medical School (USA); Kirsten N. Zaldarriaga Consing, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . .[9413-36]

4:10 pm: **Shape-based multi-region segmentation framework: application to 3D infants MRI data**, Sonia Dahdouh, Institut Mines-Telecom (France) and Télécom ParisTech (France); Isabelle Bloch, Télécom ParisTech (France) and Institut Mines-Telecom (France). . [9413-37]

4:30 pm: **LOGISMOS-B for primates: primate cortical surface reconstruction and thickness measurement**, Ipek Oguz, The Univ. of Iowa (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA); Mar Sanchez, Emory Univ. (USA); Yundi Shi, The Univ. of North Carolina at Chapel Hill School of Medicine (USA); Milan Sonka, The Univ. of Iowa (USA) . . . . [9413-38]

4:50 pm: **Robust detection of multiple sclerosis lesion from intensity-normalized multi-channel MRI**, Yogesh Karpate, Olivier Commowick, Christian Barillot, Univ. of Rennes 1 (France) . . . . . [9413-39]

5:10 pm: **Evaluation of an automatic brain segmentation method developed for neonates on adult MR brain images**, Pim Moeskops, Max A. Viergever, Manon J. N. L. Benders, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [9413-40]

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CONFERENCE 9416
Image Perception, Observer Performance, and Technology Assessment
Room: Oceans 4

SESSION 4
Room: Oceans 4 . . . . Wed 3:30 pm to 5:30 pm

CT

Session Chair: **Jovan G. Brankov,** Illinois Institute of Technology (USA)

3:30 pm: **Influence of the grayscale on phantom-based image quality assessment in x-ray computed tomography**, Frédéric Noo, The Univ. of Utah (USA); Katharina Schmitt, Siemens Healthcare (Germany). . . . . [9416-15]

3:50 pm: **Combination of detection and estimation tasks using channelized scanning linear observer for CT imaging systems**, Hsin-Wu Tseng, The Univ. of Arizona (USA); Jiahua Fan, Healthcare Systems, GE Healthcare (USA); Matthew A. Kupinski, The Univ. of Arizona (USA) . . . . . [9416-16]

4:10 pm: **What observer models best reflect low-contrast detectability in CT?**, Justin B. Solomon, Ehsan Samei, Duke Univ. School of Medicine (USA) . . . . . [9416-17]

4:30 pm: **CT image quality evaluation for detection of signals with unknown location, size, contrast and shape using unsupervised methods**, Aria X. Pezeshk, Lucretiu M. Popescu, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . . [9416-18]

4:50 pm: **Impact of number of repeated scans on model observer performance for a low-contrast detection task in CT**, Chi Ma, Lifeng Yu, Baiyu Chen, Thomas J. Vrieze, Shuai Leng, Cynthia H. McCollough, Mayo Clinic (USA). . [9416-19]

5:10 pm: **Using the Wiener estimator to determine optimal imaging parameters in a synthetic-collimator SPECT system used for small animal imaging**, Alexander L. Lin, Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona (USA); Todd E. Peterson, Lindsay H. Johnson, Sepideh Shokouhi, Vanderbilt Univ. (USA) . . . . . [9416-54]

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CONFERENCE 9417
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Oceans 2

SESSION 6
Room: Oceans 2 . . . . Wed 3:30 pm 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: **Segmentation of microcystic macular edema in Cirrus OCT scans with an exploratory longitudinal study**, Emily K. Swingle, The Ohio State Univ. (USA); Andrew Lang, Aaron Carass, Omar Al-Louzi, Johns Hopkins Univ. (USA); Shiv Saidha, The Johns Hopkins Univ. School of Medicine (USA); Jerry L. Prince, Peter A. Calabresi, Johns Hopkins Univ. (USA) . . . . . [9417-24]

3:50 pm: **Estimation of tissue optical parameters with hyperspectral imaging and spectral unmixing**, Guolan Lu, Xulei Qin, Dongsheng Wang, Georgia Zhuo Chen, Baowei Fei, Emory Univ. (USA) . . . . [9417-25]

4:10 pm: **Ultrasound-switchable fluorescence imaging in deep tissue via a sensitive USF system and NIR contrast agents**, Bingbing Cheng, The Univ. of Texas at Arlington (USA) and The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Yanbo Pei, Ming-Yuan Wei, 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); Baohong Yuan, The Univ. of Texas at Arlington (USA) . . . . . [9417-26]

4:30 pm: **An automatic labeling bifurcation method for intracoronary optical coherence tomography images**, Maysa M. G. Macedo, Univ. de São Paulo Medical School (Brazil); Celso H. Takimura, Pedro A. Lemos, Univ. of Sao Paulo Medical School (Brazil); Marco A. Gutierrez, Univ. of Sao Paulo Medical School (Brazil). . . . . [9417-27]

4:50 pm: **Optical coherence tomography (OCT) of a murine model of chronic kidney disease**, Hsing-Wen Wang, Hengchang Guo, Univ. of Maryland, College Park (USA); Peter M. Andrews, Erik Anderson, Georgetown Univ. Medical Ctr. (USA); Yu Chen, Univ. of Maryland, College Park (USA). . . . . [9417-28]

5:10 pm: **MicroCT and optical coherence tomography imagistic assessment of the dental roots adhesive**, Cosmin Sinescu, Meda-Lavinia Negrutiu, Luminita Nica, Univ. of Medicine and Pharmacy Victor Babes Timisoara (Romania); Adrian Manescu, Univ. Politecnica delle Marche (Italy); Virgil-Florin Duma, Aurel Vlaicu Univ. of Arad (Romania) and Politehnica Univ. of Timisoara (Romania) and Univ. of West Timisoara (Romania); Adrian Gh. Podoleanu, Univ. of Kent (UK) . . . [9417-29]

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CONFERENCE 9420
Digital Pathology
Room: Crystal D

SESSION 2
Room: Crystal D . . . . Wed 3:30 pm to 5:30 pm

Emerging Applications

Session Chair: **Elizabeth A. Krupinski,** The Univ. of Arizona (USA)

3:30 pm: **Anisotropic Tubular Filtering for Automatic Detection of Acid-Fast Bacilli in Ziehl-Neelsen Stained Sputum Smear Samples**, Shan E. A. Raza, The Univ. of Warwick (UK); M. Qaisar Marjan, Muhammad Arif, Pakistan Institute of Engineering and Applied Sciences (Pakistan); Farhana Butt, Faisal Sultan, Shaukat Khanum Memorial Cancer Hospital & Research Ctr. (Pakistan); Nasir M. Rajpoot, The Univ. of Warwick (UK) and Qatar Univ. (Qatar) . . . . . .[9420-4]

3:50 pm: **Aging display's effect on interpretation of digital pathology slide**, Ali R. N. Avanaki, Kathryn S. Espig, Albert Xthona, Barco, Inc. (USA); Tom Kimpe, Barco N.V. (Belgium). . . . . .[9420-5]

4:10 pm: **An adaptive algorithm for detection of multiple-type, positively stained nuclei in IHC images with minimal prior information: application to OLIG2 staining for gliomas**, Hatice Cinar Akakin, Anadolu Univ. (Turkey); Hamza N. Gokozan, Jose J. Otero, Metin N. Gurcan, The Ohio State Univ. (USA) . . . . . .[9420-6]

4:30 pm: **Characterizing primary refractory neuroblastoma: prediction of outcome by microscopic image analysis**, Muhammad Khalid Khan Niazi, The Ohio State Univ. Medical Ctr. (USA); Daniel A. Weiser, Bruce R Pawel, The Children's Hospital of Philadelphia (USA); Metin N. Gurcan, The Ohio State Univ. Wexner Medical Ctr. (USA). . . . . .[9420-7]

4:50 pm: **Confocal fluorescence microscopy for detection of cervical preneoplastic lesions**, Fahime Sheikhzadeh, The BC Cancer Agency Research Ctr. (Canada) and The Univ. of British Columbia (Canada); Rabab K. Ward, The Univ. of British Columbia (Canada); Anita Carraro, Zhaoyang Chen, Dirk van Niekerk, The BC Cancer Agency Research Ctr. (Canada); Calum E. MacAulay, The BC Cancer Agency Research Ctr. (Canada) and The Univ. of British Columbia (Canada); Michele Follen, Texas Tech Univ. Health Sciences Ctr. (USA); Pierre M. Lane, The BC Cancer Agency Research Ctr. (Canada) and The Univ. of British Columbia (Canada); Martial Guillaud, The BC Cancer Agency Research Ctr. (Canada) . . . . . .[9420-8]

5:10 pm: **Computer assisted detection and analysis of tall cell variant papillary thyroid carcinoma in histological images**, Edward Kim, Villanova Univ. (USA); Zubair Wahid Baloch, Caroline S. Kim, Univ. of Pennsylvania Health System (USA) . . . . . .[9420-9]

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THURSDAY 26 FEBRUARY

CONFERENCE 9413

Image Processing

Rooms: Crystal E

SESSION 9

Room: Crystal E . . . . . Thu 8:00 am to 9:40 am

Segmentation

Session Chairs: **Aaron Fenster,** Robarts Research Institute (Canada); **Jayaram K. Udupa,** Univ. of Pennsylvania (USA)

8:00 am: **Active contour based segmentation of resected livers in CT images**, Simon Oelmann, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany); Cristina Oyarzun Laura, Klaus Drechsler, Stefan Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) and Technischen Univ. Darmstadt (Germany) . . . . . [9413-41]

8:20 am: **FIST: a fast interactive segmentation technique**, Dirk R. Padfield, Rahul Bhotika, GE Global Research (USA); Alexander Natanzon, Intellifunction (USA) . . . . . [9413-42]

8:40 am: **A supervoxel-based segmentation for prostate MR images**, Zhiqiang Tian, Lizhi Liu, Baowei Fei, Emory Univ. (USA) . . . . . [9413-43]

9:00 am: **A new 3D neurovascular bundles (NVB) segmentation method based on MR-TRUS deformable registration**, Xiaofeng Yang, Peter Rossi, Tomi Ogunleye, Ashesh Jani, Walter Curran, Tian Liu, Emory Univ. (USA). . . . . [9413-44]

9:20 am: **Pancreas segmentation from 3D abdominal CT images using patient-specific weighted-subspatial probabilistic atlases**, Kenichi Karasawa, Masahiro Oda, Yuichiro Hayashi, Yukitaka Nimura, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazunari Misawa, Aichi Cancer Ctr. Hospital (Japan); Michitaka Mujiwara, Graduate School of Medicine, Nagoya Univ. (Japan); Kensaku Mori, Nagoya Univ. (Japan); Daniel Rueckert, Department of Computing, Imperial College (UK) . . . . . [9413-45]

POSTER AWARDS SESSION

Room: Crystal E . . . . . .9:40 am to 9:45 am

The Image Processing 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 9416

Image Perception, Observer Performance, and Technology Assessment

Room: Oceans 4

SESSION 5

Room: Oceans 4 . . . . . Thu 8:00 am to 9:40 am

Model Observers I

Session Chair: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA)

8:00 am: **Extension of a model observer based on human perception to quantify the detectability of objects in dynamic noise**, Georges Acharian, Trixell (France) and Gipsa-Lab (France); Nathalie Guyader, Gipsa-lab (France); Jean-Michel Vignolle, Trixell (France); Christian Jutten, Gipsa-lab (France) and Institut Univ. de France (France) . . . . . [9416-21]

8:20 am: **Active learning for model observer training data selection**, Iris Lorente, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . . [9416-22]

8:40 am: **Optimization of energy window and evaluation of scatter compensation methods in MPS using the ideal observer with model mismatch**, Michael Ghaly, Jonathan M. Links, Eric C. Frey, Johns Hopkins Univ. (USA) . . . . . [9416-23]

9:00 am: **Approximate maximum likelihood estimation of scanning observer template**, Craig K. Abbey, Univ. of California, Santa Barbara (USA); Frank W. Samuelson, Adam Wunderlich, Lucretiu M. Popescu, Subok Park, U.S. Food and Drug Administration (USA); John M. Boone, UC Davis Medical Ctr. (USA) [9416-24]

9:20 am: **The effect of signal variability on the histograms of anthropomorphic channel outputs: factors resulting in non-normally distributed data**, Fatma Elzahraa A. Elshahaby, Michael Ghaly, Abhinav K. Jha, Eric C. Frey, Johns Hopkins Univ. (USA). [9416-25]

POSTER AWARDS SESSION

Room: Oceans 4 . . . . . .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 9417

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 7

Room: Oceans 2 . . . . . Thu 8:00 am 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: **Initial testing of a 3D printed perfusion phantom using digital subtraction angiography**, Rachel P. Wood, Parag Khobragade, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Leslie Ying, Univ. at Buffalo (USA); Kenneth Snyder, David S. Wack, Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA)[9417-30]

8:20 am: **Angiographic analysis for phantom simulations of endovascular aneurysm treatments with a new fully retrievable asymmetric flow diverter**, Aradhana Yoganand, Rachel P. Wood, Toshiba Stroke and Vascular Research Ctr. (USA); Carlos Jimenez, Univ. de Antioquía (Colombia) and Toshiba Stroke and Vascular Research Ctr. (USA); Adnan H. Siddiqui, Kenneth Snyder, Swetadri Vasan Setlur Nagesh, Daniel R. Bednarek, Stephen Rudin, Robert Baier, Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA). . . . . [9417-31]

8:40 am: **Improved factor analysis of dynamic PET images to estimate arterial input function and tissue curves**, Debasis Mitra, Florida Institute of Technology (USA); Rostyslav Boutchko, Lawrence Berkeley National Lab. (USA); Hui Pan, Florida Institute of Technology (USA); William Jagust, Grant T. Gullberg, Lawrence Berkeley National Lab. (USA) . . . . . [9417-78]

9:00 am: **Dynamic myocardial perfusion in a porcine balloon-induced ischemia model using spectral detector CT**, Rachid Fahmi, Brendan L. Eck, Case Western Reserve Univ. (USA); Anas Fares, Univ. Hospitals of Cleveland (USA); Jacob Levi, 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) [9417-33]

9:20 am: **Low dose dynamic myocardial CT perfusion using advanced iterative reconstruction**, Brendan L. Eck, Rachid Fahmi, Case Western Reserve Univ. (USA); Christopher Fuqua, Case Western Reserve Univ. (USA) and Philips Healthcare (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) [9417-34]

POSTER AWARDS SESSION

Room: Oceans 2 . . . . . 9:40 am to 9:45 am

The Biomedical Applications in Molecular, Structural, and Functional Imaging 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 9420

Digital Pathology

Room: Crystal D

SESSION 3

Room: Crystal D . . . . . Thu 8:00 am to 9:40 am

Gastro-Intestinal/Genito-Urinary

Session Chair: **John E. Tomaszewski,** Univ. at Buffalo (USA)

8:00 am: **Automated detection of prostate cancer in digitized whole-slide images of H and E-stained biopsy specimens**, Geert Litjens, Babak Ehteshami Bejnordi, Nadya Timofeeva, Ghedhban Swadi, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Iringo Kovacs, Deventer Hospital (Netherlands); Christina A. Hulsbergen-van de Kaa, Jeroen van der Laak, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . [9420-10]

8:20 am: **Correlating gland orientation patterns on ex vivo 7 Tesla MRI with corresponding histology for prostate cancer diagnosis: preliminary analysis**, Asha Singanamalli, Case Western Reserve Univ. (USA); Sailaja Pisipati, Adnan Ali, Victoria Wang, Cheuk Ying Tang, Bachir Taouli, Ashutosh K. Tewari, Icahn School of Medicine at Mount Sinai (USA); Anant Madabhushi, Case Western Reserve Univ. (USA). . . . . [9420-11]

8:40 am: **Inter-observer variability in the classification of ovarian cancer cell type using microscopy: a pilot study**, Marios A. Gavrielides, U.S. Food and Drug Administration (USA); Brigitte M. Ronnett, Russell Vang, The Johns Hopkins Hospital (USA); Jeffrey D. Seidman, U.S. Food and Drug Administration (USA) . . . . . [9420-12]

9:00 am: **Integration of co-localized glandular morphometry and protein biomarker expression in immunofluorescent images for prostate cancer prognosis**, Richard Scott, Faisal Khan, Jack Zeineh, Michael Donovan, Gerardo Fernandez, Icahn School of Medicine at Mount Sinai (USA) . . . . . [9420-13]

9:20 am: **Toward automatic segmentation and quantification of tumor and stroma tissue in whole-slide images of H and E stained rectum carcinomas**, Oscar G. F. Geessink, Lab. of Pathology East Netherlands (Netherlands) and Medisch Spectrum Twente (Netherlands) and Univ. Twente (Netherlands); Alexi Baidoshvili, Gerard Freling, Lab. of Pathology East Netherlands (Netherlands); Joost M. Klaase, Medisch Spectrum Twente (Netherlands); Cornelis H. Slump, Ferdinand van der Heijden, Univ. Twente (Netherlands). . . . . [9420-14]

POSTER AWARDS SESSION

Room: Crystal D . . . . . 9:40 am to 9:45 am

The Digital Pathology conference poster award recipients will be recognized and certificates distributed.

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

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THURSDAY 26 FEBRUARY

CONFERENCE 9413

Image Processing

Rooms: Crystal E

SESSION 10

Room: Crystal E . . . . . Thu 10:10 am to 12:10 pm

Classification

Session Chairs: **Punam K. Saha,** The Univ. of Iowa (USA); **Ghassan Hamarneh,** Simon Fraser Univ. (Canada)

10:10 am: **Random local binary pattern based label learning for multi-atlas segmentation**, Hancan Zhu, Hewei Cheng, Yong Fan, Institute of Automation (China) . . . . . [9413-46]

10:30 am: **Multi-output decision trees for lesion segmentation in multiple sclerosis**, Amod Jog, Aaron Carass, Johns Hopkins Univ. (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA); Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9413-47]

10:50 am: **Trabecular bone class mapping across resolutions: translating methods from HR-pQCT to clinical CT**, Alexander Valentinitsch, Klinikum rechts der Isar, Technische Univ. München (Germany); Lukas Fischer, Janina M. Patsch, Medizinische Univ. Wien (Austria); Jan S. Bauer, Klinikum rechts der Isar, Technische Univ. München (Germany); Franz Kainberger, Georg Langs, Mattew D. DiFranco, Medizinische Univ. Wien (Austria) . . . . . [9413-48]

11:10 am: **Cerebral microbleed segmentation from susceptibility weighted images**, Snehashis Roy, Henry M. Jackson Foundation (USA); Amod Jog, Johns Hopkins Univ. (USA); Elizabeth Magrath, Henry M. Jackson Foundation (USA); John A. Butman, National Institutes of Health (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA) . . . . . [9413-49]

11:30 am: **Rotation invariant eigenvessels and auto-context for retinal vessel detection**, Alessio Montuoro, Christian Simader, Georg Langs, Ursula Schmidt-Erfurth, Medizinische Univ. Wien (Austria) . . . [9413-50]

11:50 am: **Deep convolutional networks for pancreas segmentation in CT imaging**, Holger R. Roth, Amal Farag, Le Lu, Evrim B. Turkbey, Ronald M. Summers, National Institutes of Health (USA) . . . . . [9413-51]

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

9413 continues on page 59

CONFERENCE 9416

Image Perception, Observer Performance, and Technology Assessment

Room: Oceans 4

SESSION 6

Room: Oceans 4 . . . . . Thu 10:10 am to 12:10 pm

Visual Search

Session Chair: **Sian Taylor-Phillips,** The Univ. of Warwick (UK)

10:10 am: **Effects of prevalence on visual search: a quantitative learning model and validation on human observer studies**, Xin He, Frank W. Samuelson, Rongping Zeng, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . . [9416-26]

10:30 am: **Ideal and visual-search observers: accounting for anatomical noise in search tasks with planar nuclear imaging**, Anando Sen, Howard C. Gifford, Univ. of Houston (USA) . . . . . [9416-27]

10:50 am: **Priming cases disturb visual search patterns in screening mammography**, Sarah J. Lewis, Warren M. Reed, Alvin N. Tan, Patrick C. Brennan, Warwick Lee, Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) . . . . . [9416-28]

11:10 am: **Fractal analysis of radiologists' visual scanning pattern in screening mammography**, Folami Alamudun, Texas A&M Univ. (USA); Hong-Jun Yoon, Oak Ridge National Lab. (USA); Kathleen Hudson, Garnetta Morin-Ducote, Univ. of Tennessee Medical Ctr. at Knoxville (USA); Georgia D. Tourassi, Oak Ridge National Lab. (USA) . . . . . [9416-29]

11:30 am: **Temporal stability of visual search-driven biometrics**, Hong-Jun Yoon, Oak Ridge National Lab. (USA); Tandy R. Carmichael, Tennessee Technological Univ. (USA); Georgia D. Tourassi, Oak Ridge National Lab. (USA) . . . . . [9416-30]

11:50 am: **Towards using eye tracking data to develop visual search for breast imaging**, Zhihua Liang, Zhengqiang Jiang, Mini Das, Howard C. Gifford, Univ. of Houston (USA) . . . . . [9416-31]

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

9416 continues on page 59

CONFERENCE 9417

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 8

Room: Oceans 2 . . . . . Thu 10:10 am to 12:10 pm

Cancer Imaging

Session Chairs: **Vikram D. Kodibagkar,** Arizona State Univ. (USA); **Baohong Yuan,** The Univ. of Texas at Arlington (USA)

10:10 am: **A pilot study of the prognostic significance of metabolic tumor size measurements in PET/CT imaging of lymphomas**, Maria Kallergi, Maria Botsivali, Nikolaos Politis, Dimitrios Menychtas, Technological Educational Institute of Athens (Greece); Alexandros Georgakopoulos, Biomedical Research Foundation, Academy of Athens (Greece); Sofia Chatziioannou, National and Kapodistrian Univ. of Athens (Greece) . . . . . [9417-104]

10:30 am: **Very low-dose adult whole-body tumor imaging with F-18 FDG PET/CT**, Andrzej Krol, Muhammad A. Naveed, Mary A. McGrath, Michele Lisi, Cathy Lavalley, David H. Feiglin, SUNY Upstate Medical Univ. (USA) . . . . . [9417-36]

10:50 am: **Improved characterization of molecular phenotypes in breast lesions using 18F-FDG PET image homogeneity**, Kunlin Cao, Roshni Bhagalia, Anup Sood, GE Global Research (USA); Edi Brogi, Ingo K. Mellinghoff, Steven M. Larson, Memorial Sloan-Kettering Cancer Ctr. (USA) . . . . . [9417-37]

11:10 am: **Fluorescence imaging to study cancer burden on lymph nodes**, Alisha V. DSouza, Jonathan T. Elliott, Jason R. Gunn, Thayer School of Engineering at Dartmouth (USA); Kimberley S. Samkoe, Geisel School of Medicine (USA); Kenneth M. Tichauer, Illinois Institute of Technology (USA); Brian W. Pogue, Thayer School of Engineering at Dartmouth (USA) . . [9417-110]

11:30 am: **MRI assessment of changes in tumor oxygenation post hypoxia-targeted therapy**, Shubhangi Agarwal, Rohini Vidya Shankar, Arizona State Univ. (USA); Landon J. Inge, St. Joseph's Hospital and Medical Ctr. (USA); Vikram D. Kodibagkar, Arizona State Univ. (USA) . . . . . [9417-39]

11:50 am: **Evaluation of a targeted nanobubble ultrasound contrast agent for potential tumor imaging**, Chunfang Li, Chunxu Shen, Haijuan Liu, Kaizhi Wu, Qibing Zhou, Mingyue Ding, Huazhong Univ. of Science and Technology (China) . . . . . [9417-40]

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

9417 continues on page 59

CONFERENCE 9420

Digital Pathology

Room: Crystal D

SESSION 4

Room: Crystal D . . . . . Thu 10:10 am to 12:10 pm

Breast

Session Chair: **Rohit Bhargava,** Univ. of Illinois at Urbana-Champaign (USA)

10:10 am: **Automatic glandular and tubule detection in histological grading of breast cancer**, Kien T. Nguyen, Chukka Srinivas, Micheal Barnes, Christophe Chefd'hotel, Ventana Medical Systems, Inc. (USA) . . . . . [9420-15]

10:30 am: **A multi-scale superpixel classification approach for region of interest detection in whole slide histopathology images**, Babak Ehteshami Bejnordi, Geert Litjens, Meyke Hermsen, Nico Karssemeijer, Jeroen van der Laak, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9420-16]

10:50 am: **High-definition Fourier transform infrared spectroscopic imaging of breast tissue**, L. Suzanne Leslie, Beckman Institute, Univ. of Illinois at Urbana-Champaign (USA); Andre Kadjacsy-Balla, Univ. of Illinois at Chicago (USA) and Univ. of Illinois Cancer Ctr. (USA); Rohit Bhargava, Univ. of Illinois at Urbana-Champaign (USA) and Univ. of Illinois Cancer Ctr. (USA) . [9420-17]

11:10 am: **Multi-class stain separation using independent component analysis**, Nicholas A. Trahearn, Nasir M. Rajpoot, The Univ. of Warwick (UK); David Snead, Univ. Hospitals Coventry and Warwickshire NHS Trust (UK); Ian A. Cree, Warwick Medical School (UK) . . . . . [9420-18]

11:30 am: **Minimum slice spacing required to reconstruct 3D shape for serial sections of breast tissue for comparison with medical imaging**, Sara Reis, Bjoern Eiben, Thomy Mertzanidou, John Hipwell, Univ. College London (UK); Meyke Hermsen, Jeroen van der Laak, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Sarah Pinder, King's College London (UK); Peter Bult, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); David Hawkes, Univ. College London (UK) . . . . . [9420-19]

11:50 am: **Color model comparative analysis for breast cancer diagnosis using H and E stained images**, Xingyu Li, Konstantinos N. Plataniotis, Univ. of Toronto (Canada) . . . . . [9420-20]

CONFERENCE 9420 ENDS

CONFERENCE 9413

Image Processing

Rooms: Crystal E

SESSION 11

Room: Crystal E . . . . . Thu 1:20 pm to 3:00 pm

Motion/Time Series

Session Chairs: **Jerry L. Prince,** Johns Hopkins Univ. (USA); **Wolfgang Wein,** Im Fusion GmbH (Germany)

1:20 pm: **Robust bladder image registration by redefining data-term in total variational approach**, Sharib Ali, Christian Daul, Ernest Galbrun, Univ. de Lorraine (France) and Ctr. de Recherche en Automatique de Nancy (France); Marine Amouroux, Université de Lorraine (France) and CRAN (France); François H. Guillemin, Univ. de Lorraine (France) and Ctr. de Recherche en Automatique de Nancy (France) and Institut de Cancérologie de Lorraine (France); Walter C. P. M. Blondel, Univ. de Lorraine (France) and Ctr. de Recherche en Automatique de Nancy (France) . . . . . [9413-52]

1:40 pm: **Joint registration of location and orientation of intravascular ultrasound pullbacks using a 3D graph based method**, Ling Zhang, Andreas Wahle, Zhi Chen, Li Zhang, Richard Downe, The Univ. of Iowa (USA); Tomas Kovarnik, 2nd Department of Internal Medicine of General University Hospital in Prague and Charles University (Czech Republic); Milan Sonka, The Univ. of Iowa (USA). . . . . [9413-53]

2:00 pm: **Optimal-mass-transfer-based estimation of glymphatic transport in living brain**, Vadim Ratner, Liangjia Zhu, Ivan Kolesov, Stony Brook Univ. (USA); Maiken Nedergaard, Rochester Univ. (USA); Helene Benveniste, Allen R. Tannenbaum, Stony Brook Univ. (USA) . . . . [9413-54]

2:20 pm: **Robust temporal alignment of multimodal cardiac sequences**, Andrea Perissinotto, Life and Health Sciences Research Institute (Portugal); Sandro Queirós, Life and Health Sciences Research Institute (Portugal) and Katholieke Univ. Leuven (Belgium) and Univ. do Minho (Portugal); Pedro Morais, Life and Health Sciences Research Institute (Portugal); Maria J. Baptista, Life and Health Sciences Research Institute (Portugal); Mark Monaghan, King's College Hospital (UK); Nuno F. Rodrigues, Life and Health Sciences Research Institute (Portugal) and Univ. do Minho (Portugal) and DIGARC, Instituto Politécnico do Cávado e do Ave (Portugal); Jan D'hooge, KU Leuven (Belgium); João L. Vilaça, Daniel Barbosa, Life and Health Sciences Research Institute (Portugal) and DIGARC, Instituto Politécnico do Cávado e do Ave (Portugal) . . . . . [9413-55]

2:40 pm: **Relating speech production to tongue muscle compressions using tagged and high-resolution magnetic resonance imaging**, Fangxu Xing, Chuyang Ye, Johns Hopkins Univ. (USA); Jonghye Woo, Univ. of Maryland, Baltimore (USA) and Johns Hopkins Univ. (USA); Maureen L. Stone, Univ. of Maryland, Baltimore (USA); Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9413-56]

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

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CONFERENCE 9416

Image Perception, Observer Performance, and Technology Assessment

Room: Oceans 4

SESSION 7

Room: Oceans 4 . . . . . Thu 1:20 pm to 3:00 pm

Model Observers II

Session Chair: **Howard C. Gifford,** Univ. of Houston (USA)

1:20 pm: **Improving lesion detectability in PET imaging with a penalized likelihood reconstruction algorithm**, Kristen Wangerin, Univ. of Washington (USA) and General Electric Co. (USA); Sangtae Ahn, Steven G. Ross, General Electric Co. (USA); Paul E. Kinahan, Univ. of Washington (USA); Ravindra M. Manjeshwar, General Electric Co. (USA). . . . . [9416-32]

1:40 pm: **SVM-based visual-search model observers for PET tumor detection**, Anando Sen, Aixia Guo, Robert Azencott, Howard C. Gifford, Univ. of Houston (USA). . . . . [9416-33]

2:00 pm: **The use of kernel local Fisher discriminant analysis for the channelization of the Hotelling model observer**, Gezheng Wen, Mia K. Markey, The Univ. of Texas at Austin (USA) . . . . . [9416-34]

2:20 pm: **Evaluation of six channelized Hotelling observers in combination with a contrast sensitivity function to predict human observer performance**, Marco Goffi, TweeSteden Ziekenhuis (Netherlands); Wouter J. H. Veldkamp, Leiden Univ. Medical Ctr. (Netherlands); Ruben E. van Engen, Ramona W. Bouwman, Dutch Reference Ctr. for Screening (Netherlands) . . . . . [9416-35]

2:40 pm: **On anthropomorphic decision making in a model observer**, Ali R. N. Avanaki, Kathryn S. Espig, Albert Xthona, Barco, Inc. (USA); Tom R. L. Kimpe, Barco N.V. (Belgium); Predrag R. Bakic, Andrew D. A. Maidment, Univ. of Pennsylvania (USA) . . . . . [9416-36]

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

9416 continues on page 60

CONFERENCE 9417

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 9

Room: Oceans 2 . . . . . Thu 1:20 pm to 3:00 pm

Lung

Session Chair: **Robert C. Molthen,** Medical College of Wisconsin (USA)

1:20 pm: **Principal component analysis of the CT density histogram to generate parametric response maps of COPD**, Nanxi Zha, Dante P. I. Capaldi, Damien Pike, David G. McCormack, Ian A. Cunningham, Grace Parraga, The Univ. of Western Ontario (Canada) . . . . . [9417-41]

1:40 pm: **Automated pulmonary lobar ventilation measurements using volume-matched thoracic CT and MRI**, Fumin Guo, Sarah Svenningsen, Emma Bluemke, Martin Rajchl, Jing Yuna, Aaron Fenster, Grace Parraga, Robarts Research Institute (Canada) . . . . . [9417-42]

2:00 pm: **3D cine magnetic resonance imaging of rat lung ARDS using gradient-modulated SWIFT with retrospective respiratory gating**, Naoharu Kobayashi, Jianxun Lei, Lynn Utecht, Univ. of Minnesota (USA); Michael Garwood, Univ. of Minnesota, Twin Cities (USA); David Ingbar, Maneesh Bhargava, Univ. of Minnesota (USA) . . . . . [9417-43]

2:20 pm: **Texture analysis of automatic graph cuts segmentations for detection of lung cancer recurrence after stereotactic radiotherapy**, Sarah A. Mattonen, The Univ. of Western Ontario (Canada); David A. Palma, The Univ. of Western Ontario (Canada) and London Regional Cancer Program (Canada); Cornelis J. A. Haasbeek, Suresh Senan, Vrije Univ. Medical Ctr. (Netherlands); Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . [9417-44]

2:40 pm: **Fourier-based linear systems description of free-breathing pulmonary magnetic resonance imaging**, Dante P. I. Capaldi, Sarah Svenningsen, Ian A. Cunningham, Grace Parraga, Robarts Research Institute (Canada) . . . . . [9417-45]

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

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CONFERENCE 9413

Image Processing

Rooms: Crystal E

SESSION 12

Room: Crystal E . . . . . Thu 3:30 pm to 5:30 pm

Registration

Session Chairs: **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Rafeef Abugharbieh,** The Univ. of British Columbia (Canada)

3:30 pm: **Automatic assessment of volume asymmetries applied to hip abductor muscles in patients with hip arthroplasty**, Christian Klemt, Marc Modat, Jonas Pichat, Manuel J. Cardoso, Univ. College London (UK); Joahnn Henckel, Alister Hart, Institute of Orthopaedics & Musculoskeletal Science (UK); Sébastien Ourselin, Univ. College London (UK) . . . . [9413-57]

3:50 pm: **Evaluation of five image registration tools for abdominal CT**, Christopher P. Lee, Zhoubing Xu, Ryan P. Burke, Rebeccah B. Baucom, Benjamin K. Poulose, Richard G. Abramson, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9413-58]

4:10 pm: **Remapping of digital subtraction angiography on a standard fluoroscopy system using 2D-3D registration**, Mazen G. Alhrishy, Alexis Guyot, Andreas Varnavas, King's College London (UK); Tom Carrell, Guy's and St Thomas' NHS Foundation Trust (UK); Andrew P. King, Graeme P. Penney, King's College London (UK) . . . . . [9413-59]

4:30 pm: **Discontinuous non-rigid registration using extended free-form deformations**, Rui Hua, José M. Pozo, Zeike A. Taylor, Alejandro F. Frangi, The Univ. of Sheffield (UK) . . . . . [9413-60]

4:50 pm: **Using image synthesis for multi-channel registration of different image modalities**, Min Chen, Amod Jog, Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9413-61]

5:10 pm: **Getting the most out of additional guidance information in deformable image registration by leveraging multi-objective optimization**, Tanja Alderliesten, Academisch Medisch Centrum (Netherlands); Peter A. N. Bosman, Ctr. voor Wiskunde en Informatica (Netherlands); Arjan Bel, Academisch Medisch Centrum (Netherlands) . . . . . [9413-62]

CONFERENCE 9413 ENDS

CONFERENCE 9416

Image Perception, Observer Performance, and Technology Assessment

Room: Oceans 4

SESSION 8

Room: Oceans 4 . . . . . Thu 3:30 pm to 5:30 pm

Technology Assessment

Session Chair: **Stephen L. Hillis,** The Univ. of Iowa (USA)

3:30 pm: **Comparison of two standalone computer-aided detection systems at multiple operating points**, Berkman Sahiner, Weijie Chen, Aria X. Pezeshk, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9416-37]

3:50 pm: **Feasibility of using a biowatch to monitor GSR as a measure of radiologists' stress and fatigue**, Elizabeth A. Krupinski, Lea MacKinnon, The Univ. of Arizona (USA); Bruce I. Reiner, Veterans Affairs Maryland Healthcare System (USA) . . . . . [9416-38]

4:10 pm: **Use of a computerized database of bone mineral density in order to improve the quality of diagnosis of osteoporosis in women**, Igor Zakharov, Kemerovo State Medical Academy (Russian Federation)[9416-39]

4:30 pm: **Augmenting real-time video with virtual models for enhanced visualization for simulation, training and guidance**, Alexander Bensch, Michael Potter, Alexander Dawson-Elli, Cristian A. Linte, Rochester Institute of Technology (USA) . . . . . [9416-40]

4:50 pm: **Objective evaluation of methods to track motion from clinical cardiac MRI sequences without the use of a gold standard**, Felipe M. Parages, Illinois Institute of Technology (USA); Thomas S. Denney Jr., Auburn Univ. (USA); Jovan G. Brankov, Illinois Institute of Technology (USA)[9416-41]

5:10 pm: **Developing a clinical utility framework to evaluate prediction models in radiogenomics**, Yirong Wu, Jie Liu, Alejandro Munoz del Rio, David C. Page, Oguzhan Alagoz, Univ. of Wisconsin-Madison (USA); Peggy Peissig, Adedayo A. Onitilo, Marshfield Clinic (USA); Elizabeth S. Burnside Rollins, Univ. of Wisconsin-Madison (USA). . . . . [9416-42]

CONFERENCE 9416 ENDS

CONFERENCE 9417

Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Oceans 2

SESSION 10

Room: Oceans 2 . . . . . Thu 3:30 pm to 5:30 pm

Bone

Session Chairs: **Axel Wismüller M.D.,** Univ. of Rochester Medical Ctr. (USA); **Robert C. Molthen,** Medical College of Wisconsin (USA)

3:30 pm: **Validation of CBCT for the computation of textural biomarkers**, Beatriz Paniagua, The Univ. of North Carolina at Chapel Hill (USA); Antonio C. Ruellas, Erika Benavides, Univ. of Michigan School of Dentistry (USA); Steve Marron, The Univ. of North Carolina at Chapel Hill (USA); Larry Wolford, Baylor Univ. (USA); Lucia Cevidanes, Univ. of Michigan School of Dentistry (USA) . . . . . [9417-46]

3:50 pm: **Validation of TMJ Osteoarthritis synthetic defect database created using non-rigid registration**, Beatriz Paniagua, Juliette Pera, Francois Budin, The Univ. of North Carolina at Chapel Hill (USA); Liliane Rosas Gomes, Univ. of Michigan, School of Dentistry (USA); Martin Styner, The Univ. of North Carolina at Chapel Hill (USA); Lucia Helena Soares Cevidanes, Univ. of Michigan, School of Dentistry (USA); Tung Nguyen, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9417-47]

4:10 pm: **Micro-computed tomography (CT) based assessment of dental regenerative therapy in the canine mandible model**, Parag Khobragade, Toshiba Stroke and Vascular Research Ctr. (USA); Amit Jain, Toshiba Stroke Research Ctr. (USA); Swetadri Vasan Setlur Nagesh, Toshiba Stroke and Vascular Research Ctr. (USA); Sebastiano Andreana, Rosemary Dziak, Univ. at Buffalo (USA); Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA); Sasi Sunkara, Sujatha Sunkara, Department of Oral Biology (USA) [9417-48]

4:30 pm: **Characterizing trabecular bone structure for assessing vertebral fracture risk on volumetric quantitative computed tomography**, Mahesh B. Nagarajan, Univ. of Rochester Medical Ctr. (USA); Walter A Checefsky, Univ of Rochester Medical Ctr (USA); Anas Z Abidin, Univ of Rochester Medical Ctr (USA); Halley Tsai, Univ. of Rochester Medical Ctr. (USA); Xixi Wang, Univ. of Rochester Medical Ctr. (USA); Susan K. Hobbs, Univ. of Rochester (USA); Jan S. Bauer, Thomas H. Baum, Technische Univ. München (Germany); Axel Wismüller, Univ. of Rochester Medical Ctr. (USA). . . . . [9417-49]

4:50 pm: **Volumetric characterization of human patellar cartilage matrix on phase contrast x-ray computed tomography**, Anas Z. Abidin, Mahesh B. Nagarajan, Univ. of Rochester Medical Ctr. (USA); Paola Coan, Paul C. Diemoz, Ludwig-Maximilians-Univ. München (Germany); Walter A Checefsky, Univ of Rochester Medical Ctr (USA); Susan K. Hobbs, Markus B. Huber, Axel Wismueller, Univ. of Rochester Medical Ctr. (USA) [9417-50]

5:10 pm: **Real time early detection system of failed wounds and heterotopic ossification imaging system using unique Raman signatures**, Asael Papour, Zachary D. Taylor, Oscar M. Stafsudd, Warren S. Grundfest, Univ. of California, Los Angeles (USA) . . . . . [9417-51]

CONFERENCE 9417 ENDS

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- Once you have signed in, click the My Account link at the top of the page. You can access your proceedings in the My Conference Proceedings tab.

Note: If your organization subscribes to the SPIE Digital Library, you can also access this content via your organization's account when logging on through your institution's network.

Should you need any assistance, please contact SPIE:
Email: SPIEDLsupport@spie.org
Phone (North America): +1 888 902 0894
Phone (Rest of World): +1 360 685 5580

Proceedings Collections

Online collections are not available for separate purchase.

Product Order Number		Collection Title/Included Volumes (See next page for volume titles and editors)	Price for CD separate purchase
Symposium CD Collection	Symposium Online Collection		Meeting Attendees Only
CDS564	**DLC564**	**Medical Imaging 2015** *9412, 9413, 9414, 9415, 9416, 9417, 9418, 9419, and 9420*	**$155**

Single Proceedings Volumes from Medical Imaging

Online proceedings volumes are not available for separate purchase.

Product Order Number		Volume Title/Volume Editors	Price for print volume separate purchase
Printed Proceedings Volume	Online Proceedings Volume		Meeting Attendees Only
9412	**DL9412**	**Medical Imaging 2015: Physics of Medical Imaging** *Christoph Hoeschen, Despina Kontos*	**$210**
9413	**DL9413**	**Medical Imaging 2015: Image Processing** *Sébastien Ourselin, Martin A. Styner*	**$165**
9414	**DL9414**	**Medical Imaging 2015: Computer-Aided Diagnosis** *Lubomir M. Hadjiiski, Georgia D. Tourassi*	**$145**
9415	**DL9415**	**Medical Imaging 2015: Image-Guided Procedures, Robotic Interventions, and Modeling** *Ziv R. Yaniv, Robert J. Webster*	**$120**
9416	**DL9416**	**Medical Imaging 2015: Image Perception, Observer Performance, and Technology Assessment** *Claudia R. Mello-Thoms, Matthew A. Kupinski*	**$80**
9417	**DL9417**	**Medical Imaging 2015: Biomedical Applications in Molecular, Structural, and Functional Imaging** *Barjor Gimi, Robert C. Molthen*	**$130**
9418	**DL9418**	**Medical Imaging 2015: PACS and Imaging Informatics: Next Generation and Innovations** *Tessa S. Cook, Jianguo Zhang*	**$70**
9419	**DL9419**	**Medical Imaging 2015: Ultrasonic Imaging and Tomography** *Johan G. Bosch, Neb Duric*	**$70**
9420	**DL9420**	**Medical Imaging 2015: Digital Pathology** *Metin N. Gurcan, Anant Madabhushi*	**$60**

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GENERAL INFORMATION

Registration

Onsite Registration and Badge Pick-Up Hours
Location: Atrium

Saturday 21 February . . . . . 7:30 am to 4:00 pm
Sunday 22 February . . . . . 7:15 am to 4:00 pm
Monday 23 February . . . . . 7:30 am to 4:00 pm
Tuesday 24 February. . . . . 7:30 am to 4:00 pm
Wednesday 25 February . . . . . 7:30 am to 4:00 pm
Thursday 26 February. . . . . 7:30 am to 1:30 pm

Conference Registration

Includes admission to all conference sessions, plenaries, panels, and poster sessions, daily lunches, coffee breaks, and a choice of proceedings. Student pricing does not include proceedings or Thursday lunch.

Course and Workshop Registration

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 the main registration desk after you pick up your badge.

Early Registration Pricing and Dates

Conference registration prices increase by US$150 (Students, $50) and course prices increase $75 after 6 February 2015. The online form will automatically display the increased prices.

SPIE Member, SPIE Student Member, and Student Pricing

- SPIE Members receive conference and course registration discounts. Discounts are applied at the time of registration.
- SPIE Student Members receive a 50% discount on all courses.
- Student registration rates are available only to undergraduate and graduate students who are enrolled full time and have not yet received their Ph.D. Post-docs may not register as students. A student ID number or proof of student status is required with your registration.

Press Registration

For credentialed press and media representatives only. Please email contact information, title, and organization to media@spie.org.

SPIE Cashier

Registration Area
Open during registration hours

Registration Payments

If you are paying by cash or check as part of your onsite registration, wish to add a course, workshop, or special event requiring payment, or have questions regarding your registration, visit the SPIE Cashier.

Receipts and Certificate of Attendance

Preregistered attendees who did not receive a receipt or attendees who need a Certificate of Attendance may obtain those from the SPIE Cashier.

Badge Corrections

Badge corrections can be made by the SPIE Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

Refund Information

There is a US$50 service charge for processing refunds. Requests for refunds must be received by 12 February 2015; all registration fees, will be forfeited after this date. Membership dues, SPIE Digital Library subscriptions or Special Events purchased are not refundable.

AUTHOR / PRESENTER INFORMATION

Speaker Check-In and Preview Station

Location: Coral A

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.

Authors must upload their oral presentation slides to the computer in their conference room. Presentations should be uploaded during the break times on the day of presentation.

Poster Setup Instructions

Oceans Ballroom

Sunday/Monday Poster Session

Author Setup Time. . . . . Sunday Noon to 1:30 pm

Authors Remove Posters . . . . . .Monday 7 pm

Tuesday/Wednesday Poster Session

Author Setup Time . . . . . Tuesday 9:40 to 11 am

Authors Remove Posters . . . . . Wednesday 7 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.

A poster author or coauthor is required to stand by the poster during the scheduled interactive poster session to answer questions from attendees.

Presenters who have not placed their poster(s) on their assigned board by 30 minutes prior to the session on the day of their presentation will be considered a "no show" and their manuscript will not be published.

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: Coral

Saturday-Thursday

WiFi available in Registration and Lobby in the Atrium, Poster area in Oceans Ballroom, and the Pool area.

Saturday-Thursday

Complimentary wired Internet access is available; attendees can hook up their laptops or use provided workstations. Complimentary wireless access is also available; instructions will be posted onsite.

SPIE Bookstore

Location: Atrium

The SPIE Bookstore is your source for the latest SPIE Press Books, Proceedings, and Education and Professional Development materials. Become an SPIE member, explore the Digital Library, and take home a free SPIE poster, gifts, and International Year of Light apparel.

SPIE Education Services

SPIE Registration Desk, Atrium

Browse course offerings and the other education services available: SPIE courses, videos, and CDs as well as customized in-company courses.

Fed Ex office

Next to Registration

Monday – Friday . . . . . .7am-5pm (Closed Sat & Sun)

Child Care Services

Super Sitters Inc., Tel: 407-382-2558
http://super-sitters.com

Note: SPIE does not imply an endorsement nor recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

Urgent Message Line

An urgent message line is available during registration hours: 407-235-7227.

Airline Check-In and Boarding Pass Kiosk

Location - one at the Navigator Desk and two located next to the Pool Entrance

Hours – 24 Hours a Day

Use this complimentary service to check in for your flight and print your boarding pass.

Lost and Found

Location: Cashier Station/Atrium
Registration Hours

Found items will be kept at Cashier until 4:00 pm each day and then turned over to Renaissance Orlando at Sea World Lost and Found (x2900) or (407)351-5555. At the end of the meeting, all found items will be turned over to Renaissance Orlando at Sea World Lost and Found (x2900) or (407)351-5555.

FOOD AND BEVERAGE SERVICES

Coffee Breaks

Complimentary coffee will be served twice each day of the conference in the following locations:

Saturday 21 Feb. . . . . .10 am and 3 pm
Reception Foyer and Upper Deck

Sunday 22 Feb.–Thursday 26 Feb. . . . . 9:30 am and 3 pm
Oceans Ballroom Foyer

Food & Refreshments for Purchase

Hot and cold snacks, hot entrees, salads, and pastries are available for purchase. Cash and credit cards accepted.

Tradewinds: Breakfast . . 6:30 am to 11:30 am
Lunch . . . . . 11:30 am to 2:30 pm
Dinner . . . . . 5:00 pm to 10:00 pm

Starbucks:. . . . . 6 am to 7 pm

Boardwalk: . . . . . 2:30 pm to 1:00 am
(Food Service until 12:00 am)

Mist Sushi and Spirits:. . . 5:00 pm to 10:00 pm

Palms:. . . . . 12:00 pm to 5:00 pm

Toppers (Ice Cream): . . . 12:00 pm to 11:00 pm

Room Service:. . . . . 6:00 am to 12:00 am

SPIE-Hosted Lunches

Location: Pool Terrace & Lawn

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 Sunday through Wednesday with their registration.

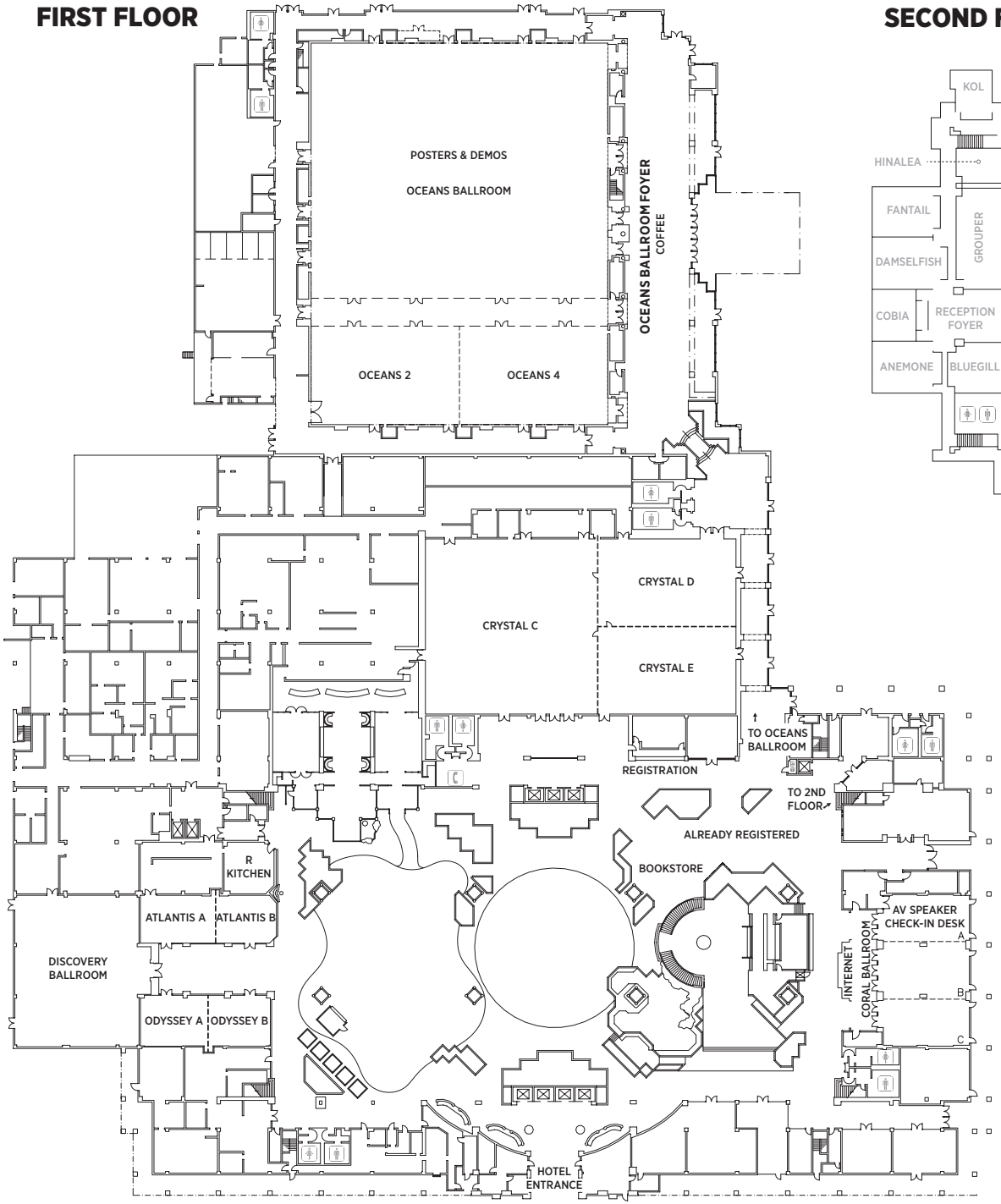
Students may purchase additional lunch tickets from the Cashier at the SPIE Registration Desk if tickets are available. The Registration staff will be notified of available seating starting 10 minutes after the last conference room breaks, usually between 12:20 to 12:30 pm. All attendees need to make their own lunch arrangements on Saturday.

Should inclement weather prevent outdoor lunches, they will be served in the Atrium.

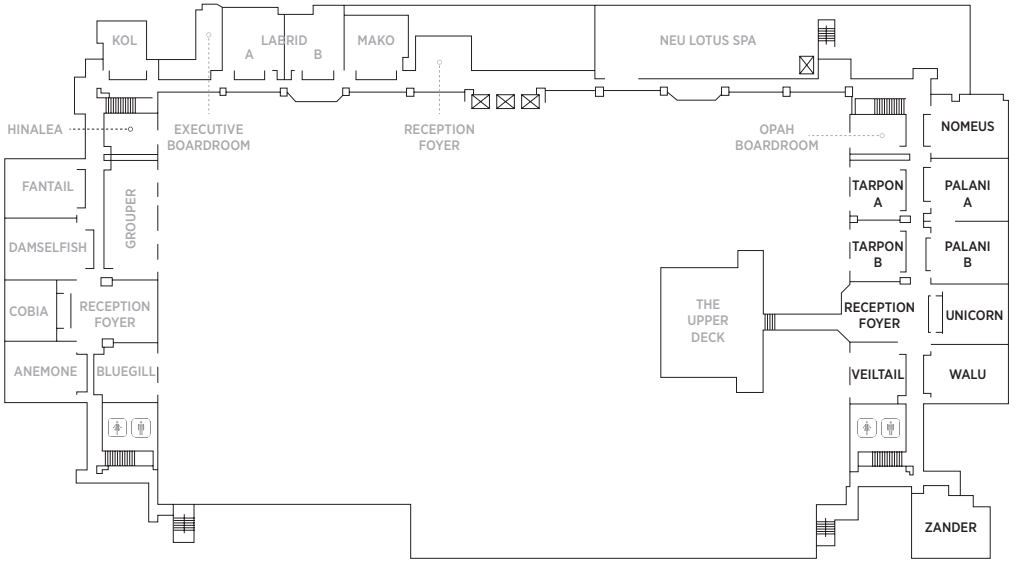
Students may enter a drawing for donated Thursday lunch tickets at the Registration Desk on Thursday morning before 9:30 am.

RENAISSANCE ORLANDO FACILITY MAPS

FIRST FLOOR



SECOND FLOOR



SPIE EVENT POLICIES

Acceptance of Policies and Registration Conditions

The following Policies and Conditions apply to all SPIE Events. As a condition of registration, you will be required to acknowledge and accept the SPIE Registration Policies and Conditions contained herein.

Granting Attendee Registration and Admission

SPIE, or their officially designated event management, in their sole discretion, reserves the right to accept or decline an individual's registration for an event. Further, SPIE, or event management, reserves the right to prohibit entry or remove any individual whether registered or not, be they attendees, exhibitors, representatives, or vendors, who in their sole opinion are not, or whose conduct is not, in keeping with the character and purpose of the event. Without limiting the foregoing, SPIE and event management reserve the right to remove or refuse entry to any attendee, exhibitor, representative, or vendor who has registered or gained access under false pretenses, provided false information, or for any other reason whatsoever that they deem is cause under the circumstances.

Misconduct Policy

SPIE is a professional, not-for-profit society committed to providing valuable conference and exhibition experiences. SPIE is dedicated to equal opportunity and treatment for all its members and meeting attendees. Attendees are expected to be respectful to other attendees, SPIE staff, and contractors. Harassment and other misconduct will not be tolerated; violators will be asked to leave the event.

Identification

To verify registered participants and provide a measure of security, SPIE will ask attendees to present a government-issued Photo ID at registration to collect registration materials.

Individuals are not allowed to pick up badges for attendees other than themselves. Further, attendees may not have some other person participate in their place at any conference-related activity. Such other individuals will be required to register on their own behalf to participate.

Capture and Use of a Person's Image

By registering for an SPIE event, I grant full permission to SPIE to capture, store, use, and/or reproduce my image or likeness by any audio and/or visual recording technique (including electronic/digital photographs or videos), and create derivative works of these images and recordings in any SPIE media now known or later developed, for any legitimate SPIE marketing or promotional purpose.

By registering for an SPIE event, I waive any right to inspect or approve the use of the images or recordings or of any written copy. I also waive any right to royalties or other compensation arising from or related to the use of the images, recordings, or materials. By registering, I release, defend, indemnify and hold harmless SPIE from and against any claims, damages or liability arising from or related to the use of the images, recordings or materials, including but not limited to claims of defamation, invasion of privacy, or rights of publicity or copyright infringement, or any misuse, distortion, blurring, alteration, optical illusion or use in composite form that may occur or be produced in taking, processing, reduction or production of the finished product, its publication or distribution.

Payment Method

Registrants for paid elements of the event, who do not provide a method of payment, will not be able to complete their registration. Individuals with incomplete registrations will not be able to attend the conference until payment has been made. SPIE accepts VISA, MasterCard, American Express, Discover, Diner's Club, checks and wire transfers. Onsite registrations can also pay with Cash.

Authors/Coauthors

By submitting an abstract, you agree to the following conditions:

- An author or coauthor (including keynote, invited, and solicited speakers) will register at the author registration rate, attend the meeting, and make the presentation as scheduled.
- A full-length manuscript (minimum 6 pages) for any accepted oral or poster presentation will be submitted for publication in the SPIE Digital Library, printed conference Proceedings, and CD. (Some SPIE events have other requirements that the author is made aware of at the time of submission.)
- Only papers presented at the conference and received according to publication guidelines and timelines will be published in the conference Proceedings and SPIE Digital Library (or via the requirements of that event).

Audio, Video, Digital Recording Policy

Conferences, courses, and poster sessions: For copyright reasons, recordings of any kind are prohibited without prior written consent of the presenter or instructor. Attendees may not capture or use the materials presented in any meeting/course room or in course notes on display without written permission. Consent forms are available at Speaker Check-In. Individuals not complying with this policy will be asked to leave a given session and/or asked to surrender their recording media.

EXHIBITION HALL: For security and courtesy reasons, recordings of any kind are prohibited unless one has explicit permission from on-site company representatives. Individuals not complying with this policy will be asked to surrender their recording media and to leave the exhibition hall.

Your registration signifies your agreement to be photographed or videotaped by SPIE in the course of normal business. Such photos and video may be used in SPIE marketing materials or other SPIE promotional items.

Laser Pointer Safety Information/Policy

SPIE supplies tested and safety-approved laser pointers for all conference meeting rooms. For safety reasons, SPIE requests that presenters use provided laser pointers.

Use of a personal laser pointer represents user's acceptance of liability for use of a non-SPIE-supplied laser pointer. If you choose to use your own laser pointer, it must be tested to ensure <5 mW power output. Laser pointers in Class II and IIIa (<5mW) are eye safe if power output is correct, but output must be verified because manufacturer labeling may not match actual output. Come to Speaker Check-In and test your laser pointer on our power meter. You are required to sign a waiver releasing SPIE of any liability for use of potentially non-safe, personal laser pointers. Misuse of any laser pointer can lead to eye damage.

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.

Underage Persons on Exhibition Floor Policy

For safety and insurance reasons:

- No persons under the age of 18 will be allowed in the exhibition area during move-in and move-out.
- Children 14 and older, accompanied by an adult, will be allowed in the exhibition area during open exhibition hours only.
- All children younger than 14, including babies in strollers and toddlers, are not allowed in the exhibition area at any time.

Unauthorized Solicitation Policy

Unauthorized solicitation in the Exhibition Hall is prohibited. Any non-exhibiting manufacturer or supplier observed to be distributing information or soliciting business in the aisles, or in another company's booth, will be asked to leave immediately.

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 and exhibition 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 & 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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www.spie.org/mi2016

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

Conferences & Courses:
27 February—3 March 2016