2014 Medical Imaging

Technical Program

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

Conference and Courses
15–20 February 2014

Technologies

- Physics of Medical Imaging
- Image Processing
- Computer-Aided Diagnosis
- Image-Guided Procedures, Robotic Interventions, and Modeling
- Image Perception, Observer Performance, and Technology Assessment
- Biomedical Applications in Molecular, Structural, and Functional Imaging
- PACS and Imaging Informatics: Next Generation and Innovations
- Ultrasonic Imaging and Tomography
- Digital Pathology

2014 Medical Imaging

15–20 February 2014
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Cooperating Organizations:

American Association of Physicists in Medicine

American Physiological Society

Computer Assisted Radiology and Surgery

DICOM Standards Committee

Medical Image Perception Society

Radiological Society of North America

Society for Imaging Informatics in Medicine

World Molecular Imaging Society

Welcome to San Diego

On behalf of SPIE and the conference organizers, we welcome you to Medical Imaging 2014, 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:

Ehsan Samei,
Duke Univ. (USA)

David Manning,
Lancaster Univ. (UK)

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Thanks to our 2014 Sponsors. Look for our sponsors by their distinctive badge ribbon. Be sure to stop by their tables located in the Atlas Foyer, or engage with them at the various events onsite.

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

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

Contents

Special Events

Technical Conferences

General Information

SPIE

Session Chairs:

Ehsan Samei,
Duke Univ. (USA)

David Manning,
Lancaster Univ.
(UK)

Student Paper Awards

The first and second place winners of the Robert F. Wagner Student Paper Award will be announced and conference finalists recognized. See page 3 for details.

Monday 17 February · 4:00 to 5:30 pm · Town & Country

The Emerging Role of Quantitative Imaging Biomarkers

John Gore, Ph.D.
Vanderbilt University, School of Engineering
Director, Institute for Imaging Science, School of Medicine

The development and applications of quantitative imaging biomarkers are essential goals for modern biomedical imaging science. Imaging biomarkers are growing in their diversity and impact, and are of particular importance in the evaluation of novel drugs and treatments. In cancer, molecular imaging using PET and optical methods report directly on cellular events and characteristics, and are complemented by MRI, CT and US methods that measure downstream effects such as changes in tumor volume, cell density, tissue vascular properties and blood flow. These are being applied in evaluating new drugs and in clinical trials, and are proving useful in cancer management, especially to evaluate treatment response. Integrating multiple data sets from different modalities such as PET and MRI can provide a more comprehensive view of tumor metabolic and physiological state. In neuroscience, quantitative brain morphometry is used to characterize and distinguish subject groups and identify structural variants in individuals which correlate with behavior and function. PET studies of neurotransmitters and their transporters are well established and provide direct evidence of whether drugs hit specific targets, along with their in vivo binding properties. Functional MRI based on BOLD (blood oxygen level dependent) signals provides unique insights into neural circuits and inter-regional functional connectivities, which may be quantified to assess changes with treatment, development, degeneration or as an index of severity of disease. Pharmaceutical MRI uses similar measurements to evaluate the actions of drugs and specific signaling pathways in the brain. In diabetes and metabolic disorders, measures of tissue composition, physiology and metabolism provide quantitative indices of disease risk and progression. Overall, there are numerous such biomarkers under development in many different areas of application in each modality, and these activities define much of the research in current imaging science.

John C. Gore, Ph.D., is Director of the Institute of Imaging Science and Hertha Ramsey Cress University Professor of Radiology and Radiological Sciences, Biomedical Engineering, Physics and Astronomy, and Molecular Physiology and Biophysics at Vanderbilt University. Dr. Gore obtained his Ph.D. in Physics at the University of London in the UK in 1976 and has been an active leader in imaging research and applications for almost 40 years. He also holds a degree in Law. He is a Member of the National Academy of Engineering, an elected fellow of the American Association for the Advancement of Science, the American Institute of Medical and Biological Engineering, the International Society for Magnetic Resonance in Medicine (ISMRM), and the Institute of Physics (UK), as well as a Distinguished Investigator of the Academy of Radiology Research. In 2004 Dr. Gore was awarded the Gold Medal of the ISMRM for his contributions to the field of magnetic resonance imaging. He is editor-in-chief of the journal Magnetic Resonance Imaging and serves on the National Advisory Council for Biomedical Imaging and Bioengineering. He has published over 500 original papers and contributions within the medical imaging field. His research interests include the development and application of imaging methods for understanding tissue physiology and structure, molecular imaging and functional brain imaging.

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

Congratulations Conference Finalists

The following student authors will advance to the final round of the Robert F. Wagner Best Student Paper competition. Their papers were chosen from 84 submissions.

Physics of Medical Imaging (9033)

Increased microcalcification visibility in lumpectomy specimens using a stationary digital breast tomosynthesis system
Paper 9033-40
Student Author: **Andrew W. Tucker,** The Univ. of North Carolina at Chapel Hill (USA)

Prospective optimization of CT under tube current modulation: I. organ dose
Paper 9033-60
Student Author: **Xiaoyu Tian,** Duke Univ. (USA)

Image Processing (9034)

Registration of organs with sliding interfaces and changing topologies
Paper 9034-13
Student Author: **Floris F. Berendsen,** Univ. Medical Ctr. Utrecht (Netherlands)

Statistical label fusion with hierarchical performance models
Paper 9034-49
Student Author: **Andrew J. Asman,** Vanderbilt Univ. (USA)

Computer-Aided Diagnosis (9035)

Multi-fractal texture features for brain tumor and edema segmentation
Paper 9035-2
Student Author: **Syed Reza,** Old Dominion Univ. (USA)

MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression
Paper 9035-78
Student Author: **Antonio Martínez-Torteya,** Tecnológico de Monterrey (Mexico)

Image-Guided Procedures, Robotic Interventions, and Modeling (9036)

Deformable registration for image-guided spine surgery: preserving rigid body vertebral morphology in free-form transformations
Paper 9036-27
Student Author: **Sureerat Reaungamornrat,** Johns Hopkins Univ. (USA)

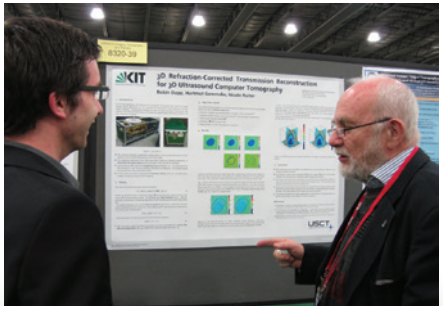
Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation
Paper 9036-49
Student Author: **Geert Litjens,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Image Perception, Observer Performance, and Technology Assessment (9037)

Task-based optimization of image reconstruction in breast CT
Paper 9037-18
Student Author: **Adrian A. Sanchez,** The Univ. of Chicago Medical Ctr. (USA)

Biomedical Applications in Molecular, Structural, and Functional Imaging (9038)

Development and application of pulmonary structure-function registration methods: towards pulmonary image-guidance tools for improved airway targeted therapies and outcomes
Paper 9038-70
Student Author: Fumin Guo, Robarts Research Institute (Canada)
Co-Author(s): Damien Pike, Sarah Svenningsen, Robarts Research Institute (Canada); Harvey O. Coxson, Vancouver General Hospital (Canada); John J. Drozd, Jing Yuan, Aaron Fenster, Grace Parraga, Robarts Research Institute (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

PACS and Imaging Informatics: Next Generation and Innovations (9039)

Local image descriptor-based searching framework of usable similar cases in a radiation treatment planning database for stereotactic body radiotherapy
Paper 9039-18
Student Author: Ayumi Nonaka, Kyushu Univ. (Japan)

Ultrasonic Imaging and Signal Processing (9040)

Prostate clinical study of a full inversion unconstrained ultrasound elastography technique
Paper 9040-3
Student Author: **Seyed Reza Mousavi,** Western Univ. Canada (Canada)

Digital Pathology (9041)

Towards automatic patient selection for chemotherapy in colorectal cancer trials
Paper 9041-9
Student Author: **Alexander I. Wright,** Univ. of Leeds (United Kingdom)

Daily Event Schedule

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
15 February	16 February	17 February	18 February	19 February	20 February
SC086 **Fundamentals of Medical Image Processing and Analysis** (Deserno) 8:30 am to 5:30 pm, p.18	KEYNOTE PRESENTATIONS Conf. 9037: **Visual Search from Lab to Clinic and Back** *(Wolfe)* 8:00 am, p.13 Conf. 9041: **Path, Present and Future** *(Levenson)* 1:20 pm, p.13	**9033 Physics of Medical Imaging** (Whiting, Hoeschen, Kontos) p.20			
SC471 **Principles and Advancements in X-ray Computed Tomography** (Hsieh) 8:30 am to 12:30 pm, p.19	**9034 Image Processing** (Ourselin, Styner) p.20			**9040 Ultrasonic Imaging and Tomography** (Bosch, Doyley) p.15	
SC1127 **ROC Analysis and Observer Studies to Evaluate Imaging Technology** (Hillis, Nishikawa, Samuelson) 8:30 am to 5:30 pm, p.18	**9037 Image Perception, Observer Performance, and Technology Assessment** (Mello-Thoms, Kupinski) p.20		**9035 Computer-Aided Diagnosis** (Aylward, Hadjiiski) p.20		
SC1064 **Radiation Dose in CT** (McNitt-Gray) 1:30 to 5:30 pm, p.19	**9038 Biomedical Applications in Molecular, Structural, and Functional Imaging** (Molthen, Weaver) p.21			**9039 PACS and Imaging Informatics: Next Generation and Innovations** (Law, Cook) p.21	
WS776 **Writing for Publication in Medical Imaging** (Hanson) 8:30 am to 12:30 pm, p.19	**9041 Digital Pathology** (Gurcan, Madabhushi) p.21		**9036 Image-Guided Procedures, Robotic Interventions, and Modeling** (Yaniv, Holmes) p.20		
WS757 **Early Career Professional Development in Medical Imaging** (Krupinski) 1:30 to 5:30 pm, p.19	**Sunday/Monday Poster Session**		**Tueday/Wednesday Poster Session**		SPECIAL SESSION Conf. 9039: **Radiology for the Non-Radiologists,** 10:10 am to 12:10 pm, p.10
	SC1128 **Non-diffraction Computed Tomography Image Analysis** (Lei) 8:30 am to 12:30 pm, p.18	KEYNOTE PRESENTATIONS: Conf. 9033: **Noninvasive functional assessment of coronary artery disease using cardiac CT imaging and computational fluid dynamics** *(Taylor)* 8:00 am, p.12 Conf. 9038: **Advancing Technologies for Preclinical Molecular Imaging** *(Cherry)* 10:10 am, p.13 Conf. 9034: **Large scale digital atlases in neuroscience,** *(Hawrylycz)* 1:20 pm, p.12	PANEL DISCUSSION: Conf. 9035: **CAD Successes and Failures**, 8:00 to 10:10 am, p.10	SC1026 **Graph Algorithmic Techniques for Biomedical Image Segmentation** (Garvin, Wu) 8:30 am to 12:30 pm, p.18	
	SC987 **Spectral CT Imaging** (Heismann, Schmidt, Flohr) 8:30 am to 12:30 pm, p.19		**Women's Networking Lunch,** 12:10 to 1:20 pm, p.7	KEYNOTE PRESENTATIONS Conf. 9035: **Opportunities and challenges for diagnostic decision support systems,** *(Karssemeijer)* 8:00 am, p. 12 Conf. 9039: **Re-thinking CAD for the next generation** *(Siegel)* 8:45 am, p.12 Conf. 9040: **Advances in Acoustic Microscopy and High Resolution Ultrasonic Imaging: from Principles to New Applications** *(Maev)* 10:10 am, p.13 Conf. 9036 **Engineering Therapeutic Processes: From Research to Commodity** (Galloway) 1:20 pm, p.13	
	SC1129 **Photon Counting X-ray Imaging: Technology and Methods** (Danielsson, Bornefalk) 1:30 to 5:30 pm, p.18		TECHNICAL WORKSHOPS, 5:00 to 7:00 pm, p.15 Conf. 9033: **X-ray Sources,** *(Whiting, Hoeschen)* Conf. 9035: **Live Demonstrations** *(Aylward, Chan)* Conf. 9036: **Commercialization of Medical Research** *(Shechter, Yaniv)* Conf. 9039: **DICOM** *(Horii)*		
	SC358 **X-Ray Detector Performance and DQE: Principles and Measurements using a Linear-Systems Approach** (Cunningham) 1:30 to 5:30 pm, p.19				
	CONF. 9041 PANEL DISCUSSION: **The Design and Benefits of Successful Grand Challenges,** 3:30 to 5:30 pm, p.10	**Meet with NIH Staff**, 1:30 to 3:30 pm, p.14			
	TECHNICAL WORKSHOPS, 5:45 to 7:45 pm, p. 14 Conf9034: **Methods and Application of Brain Connectivity** *(Styner)* Conf. 9037: **Dose, Risk and Task Performance** *(Krupinski)* Conf. 9038: **The Evolution of Preclinical Molecular Imaging,** *(Farhoud)* Conf. 9041: **What do pathologists see on a slide?: Implications for Digital Pathology** *(Gurcan, Madabhushi)* NON TECHNICAL WORKSHOP: **Understanding the NIH Peer Review System Relative When Competing for Grant Awards** *(Rosen, Gill)*	PLENARY PRESENTATION AND STUDENT PAPER AWARDS: **The Emerging Role of Quantitative Imaging Biomarkers** (Gore), 4:00 to 5:15 pm, p. 2		**Interactive Poster Session and Reception,** 5:30 to 7:00 pm	
		Interactive Poster Session and Reception, 5:15 to 6:45 pm			
		Dessert with the Experts - A Student Networking Event, 6:30 to 7:30 pm, p.10			

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

Daily Conference Session Schedule

TIME	Conference 9033	Conference 9034	Conference 9035	Conference 9036	Conference 9037	Conference 9038	Conference 9039	Conference 9040	Conference 9041
SUNDAY · 16 February									
8:00 to 9:40 am		SESSION 1: **OCT and Ultrasound** *(Aaron Fenster, Mona K. Garvin)*			SESSION 1: **Keynote and Visual Search** *(Claudia R. Mello-Thoms, Matthew A. Kupinski)*	SESSION 1: **General MR Techniques** *(Barjor Gimi, Alejandro F. Frangi)*			
9:40 to 10:10 am	Coffee Break								
10:10 am to 12:10 pm		SESSION 2: **Segmentation** *(Brian Nutter, Elsa D. Angelini)*			SESSION 2: **Image Perception** *(Elizabeth A. Krupinski)*	SESSION 2: **fMRI and Brain** *(Nicholas J. Tustison, Barjor Gimi)*			
12:10 to 1:20 pm	Lunch Break								
1:20 to 3:00 pm		SESSION 3: **Temporal and Motion Analysis** *(Jerry L. Prince, Jayaram K. Udupa)*			SESSION 3: **Observer Performance** *(Howard C. Gifford)*	SESSION 3: **Optical Coherence Tomography** *(Xavier Intes)*			SESSION 1: **Keynote** *(Metin N. Gurcan, Anant Madabhushi)*
3:00 to 3:30 pm	Coffee Break								
3:30 to 5:30 pm		SESSION 4: **Cardiac and Vascular** *(Boudewijn P. F. Lelieveldt, Alejandro F. Frangi)*			SESSION 4: **Technology Assessment** *(Jovan G. Brankov)*	SESSION 4: **Fluidics and Vascular** *(Amir A. Amini, Robert C. Moltheni)*			SESSION 2: **The Design and Benefits of Successful Grand Challenges**
5:45 to 7:45 pm	**Technical Workshops**								
MONDAY · 17 February									
8:00 to 9:40 am	SESSION 1: **Keynote and Cardiac CT** *(Bruce R. Whiting, Christoph Hoeschen)*	SESSION 5: **DTI** *(Sonia Pujol, James C. Gee)*			SESSION 5: **Model Observers: Imaging Applications** *(Craig K. Abbey)*	SESSION 5: **Myocardial Function** *(Armando Manduca, Amir A. Amini)*			SESSION 3: **Imaging and Pathology Conversion** *(Martin J. Yaffe)*
9:40 to 10:10 am	Coffee Break								
10:10 am to 12:10 pm	SESSION 2: **CT and Applications** *(Taly G. Schmidt, Robert M. Nishikawa)*	SESSION 6: **Shape** *(Punam K. Saha, Cristian Lorenz)*			SESSION 6: **Observer Performance: Breast** *(Patrick C. Brennan)*	SESSION 6: **Keynote and Molecular Imaging** *(Robert C. Molthen, John B. Weaver)*			SESSION 4: **Acquisition, Processing and Storage of Microscopic Images** *(Anne L. Martel)*
12:10 to 1:20 pm	Lunch Break								
1:20 to 3:40 pm	SESSION 3: **Phase Contrast Imaging** *(Mini Das, Thomas G. Flohr)*	SESSION 7: **Keynote and Brain** *(David R. Haynor, Benoit M. Dawant)*			SESSION 7: **Model Observers: General** *(Subok Park)*	SESSION 7: **Lung** *(Merryn Tawhai, Robert C. Molthen)*			SESSION 5: **Observer Performance and Human Factors** *(Elizabeth A. Krupinski)*
3:30 to 4:00 pm	Coffee Break				POSTER AWARD ANNOUNCEMENTS				POSTER AWARD ANNOUNCEMENTS
4:00 to 5:15 pm	**Best Student Paper Awards and Plenary Presentation**								
5:15 to 6:45 pm	**Sunday/Monday Poster Session**								

TIME	Conference 9033	Conference 9034	Conference 9035	Conference 9036	Conference 9037	Conference 9038	Conference 9039	Conference 9040	Conference 9041
TUESDAY · 18 February									
8:00 to 9:40 am	SESSION 4: **Algorithms** *(John Yorkston, Kirsten Boedeker)*	SESSION 8: **Classification and Texture** *(Baowei Fei)*	SESSION 1: **CAD Successes and Failures** *(Stephen Aylward, Lubomir M. Hadjiiski)*	SESSION 1: **Abdominal Procedures** *(Pierre Jannin, Ivo Wolf)*		SESSION 8: **Bone** *(Erik L. Ritman, Axel Wismüller)*			
9:40 to 9:45 am		POSTER AWARD ANNOUNCEMENTS				POSTER AWARD ANNOUNCEMENTS			
9:40 to 10:10 am	Coffee Break								
10:10 am to 12:10 pm	SESSION 5: **CT Reconstructions** *(Guang-Hong Chen, Marc Kachelriess)*	SESSION 9: **Registration** *(Josien P. W. Pluim)*	SESSION 2: **Head, Neck, and Novel Methods** *(Marius George Linguraru, Eva M. van Rikxoort)*	SESSION 2: **Laparoscopy/ Endoscopy/ Bronchoscopy/ Colonoscopy** *(William E. Higgins, Kensaku Mori)*		SESSION 9: **Microenvironment and Magnetic Particle Imaging** *(John B. Weaver, Thorsten M. Buzug)*			
12:10 to 1:20 pm	Lunch Break								
1:20 to 3:00 pm	SESSION 6: **Reconstruction** *(Jinyi Qi, Despina Kontos)*	SESSION 10: **Atlas-based Segmentation** *(Bennett A. Landman)*	SESSION 3: **Prostate and Colon I** *(Janne J. Näppi, Maryellen L. Giger)*	SESSION 3: **Novel Intraoperative Imaging and Visualization** *(David R. Haynor, Eric J. Seibel)*		SESSION 10: **MR Elastrography** *(Armando Manduca, John B. Weaver)*			
3:00 to 3:30 pm	Coffee Break								
3:30 to 4:50 pm	SESSION 7: **Cone Beam CT and Novel Design** *(Stephen J. Glick, Michael Grass)*	SESSION 11: **Magnetic Resonance Imaging** *(Olivier Mitra, Sunanda D. Mitra)*	SESSION 4: **Vessels, Heart, and Eye I** *(Bram van Ginneken,Thomas M. Deserno)*	SESSION 4: **Respiratory and Cardiac Motion Compensation** *(Wolfgang Birkfellner, Jay B. West)*		ESSION 11: **Breast** *(Axel Wismüller, Armando Manduca)*			
5:00 to 7:00 pm	Technical Workshops								
WEDNESDAY · 19 February									
8:00 to 9:40 am	SESSION 8: **Tomosynthesis** *(John M. Sabol, Anders Tingberg)*		SESSION 5: **Keynote:** Joint Session with Conferences 9035 and 9039 *(Heinz U. Lemke)*	SESSION 5: **Segmentation** *(Alexandre X. Falcão, Purang Abolmaesumi)*		SESSION 12: **Ultrasound Elastography:** Joint Session with Conferences 9038 and 9040 *(John B. Weaver, Marvin M. Doyley)*	SESSION 1 **Keynote:** Joint Session with Conferences 9035 and 9039 *(Heinz U. Lemke)*	SESSION 1: **Ultrasound Elastography:** Joint Session with Conferences 9038 and 9040 *(John B. Weaver, Marvin M. Doyley)*	
9:40 to 10:10 am	Coffee Break								
10:10 am to 12:10 pm	SESSION 9: **Multi-energy CT** *(Mats E. Danielsson, Taly G. Schmidt)*		SESSION 6: **Lung, Chest, and Abdomen I** *(Nicholas A. Petrick, Jong Hyo Kim)*	SESSION 6: **Registration** *(Steven L. Hartmann, Lena Maier-Hein)*			SESSION 2: **Beyond PACS: Advanced Radiology Workflow** *(Brent J. Liu)*	SESSION 2: **Keynote and Acoustic Microscopy and Tissue Characterization** *(Neb Duric)*	
12:10 to 1:20 pm	Lunch Break								

See Town & Country Resort and Convention Center Facility Map page 78.

Daily Conference Session Schedule

TIME	Conference 9033	Conference 9034	Conference 9035	Conference 9036	Conference 9037	Conference 9038	Conference 9039	Conference 9040	Conference 9041
WEDNESDAY Afternoon · 19 February									
1:20 to 3:00 pm	SESSION 10: **Multi-energy Imaging and Detectors** *(John A. Rowlands, Joseph Y. Lo)*		SESSION 7: **Vessels, Heart, and Eye II** *(Marleen de Bruijne, Clarisa Sánchez)*	SESSION 7: **Keynote and Bench to Bedside** *(David R. Holmes III, Ziv R. Yaniv)*			SESSION 3: **Medical Image Sharing and Exchange** *(Jianguo Zhang)*	SESSION 3: **Ultrasound Image Analysis** *(Johan G. Bosch)*	
3:00 to 3:30 pm	Coffee Break								
3:30 to 5:30 pm	SESSION 11: **New Contrast Mechanisms** *(Norbert J. Pelc, Maria Drangova)*		SESSION 8: **Breast I** *(Susan M. Astley,Georgia D. Tourassi)*	SESSION 8: **Robotics and Tracking** *(David M Kwartowitz, Robert J. Webster III)*			SESSION 4: **Diagnostics and Therapeutic Applications of Imaging Informatics** *(Thomas M. Deserno)*	SESSION 4: **Transducers and Beamforming** *(Bae-Hyung Kim)*	
5:30 to 7:00 pm	Tuesday/Wednesday Poster Session								
THURSDAY · 20 February									
8:00 to 9:40 am	SESSION 12: **Dose** *(Andreu Badal, Hilde Bosmans)*		SESSION 9: **Prostate and Colon II** *(Kensaku Mori, Ronald M. Summers)*	SESSION 9: **Simulation and Modeling** *(Michael I. Miga, Kenneth H. Wong)*			SESSION 5: **Knowledge, Search and Data Mining** *(William W. Boonn)*	SESSION 5: **Photoacoustics** *(Navalgund A. Rao, Robert A. Kruger)*	
9:40 to 9:45 am	STUDENT PAPER AND POSTER AWARD ANNOUNCEMENTS		POSTER AWARD ANNOUNCEMENTS	YOUNG SCIENTIST BEST PAPER AND 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 13: **Phantoms** *(Bruce Whiting, Andreu Bada)*		SESSION 10: **Musculoskeletal and Miscellaneous** *(Axel Wismüller, Michael F. McNitt-Gray)*	SESSION 10: **Pelvic Procedures** *(Tamas Ungi, Frank Sauer)*			SESSION 6: **Radiology for the Non-Radiologists** *(Maria Y. Law)*	SESSION 6: **Ultrasound Tomography** *(Neb Duric, Nicole V. Ruiter)*	
12:10 to 1:20 pm	Lunch Break								
1:20 to 3:00 pm	SESSION 14: **Metrology and System Characterization** *(Karim S. Karim, Joseph Y. Lo)*		SESSION 11: **Breast II** *(Horst Karl Hahn, Hiroshi Fujita)*	SESSION 11: **Ultrasound Image Guidance:** Joint Session with Conferences 9036 and 9040 *(Purang Abolmaesumi, Johan G. Bosch)*				SESSION 7: **Ultrasound Image Guidance:** Joint Session with Conferences 9036 and 9040 *(Purang Abolmaesumi, Johan G. Bosch)*	
3:00 to 3:30 pm	Coffee Break								
3:30 to 5:30 pm	SESSION 15: **Performance Evaluation** *(Despina Kontos, Christoph Hoeschen)*		SESSION 12: **Lung, Chest, and Abdomen II** *(Kyongtae Ty Bae, Rafael Wiemker)*	SESSION 12: **Cardiac Procedures** *(Baowei Fei, Maryam E. Rettmann)*				SESSION 8: **Doppler and Novel Imaging Applications** *(Jørgen Arendt Jensen)*	

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MULTI-CONFERENCE PANEL DISCUSSION

The Design and Benefits of Successful Grand Challenges

Sunday 3:30 to 5:30 pm
Location: Golden West

Panel Members:
George Redmond, National Cancer Institute/ NIH (USA)
Sonia Pujol, Brigham and Women's Hospital (USA)
Stephen Aylward, Kitware, Inc. (USA)
Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)
Eric Pepper, SPIE (USA)

The Retrospective Image Registration Evaluation (RIRE) project began at Vanderbilt in 2001 and was one of the first, highly successful grand challenges in the field of medical image computation. It is largely responsible for the rapid growth in the use of registration metrics based on mutual information and the use of target registration error for registration accuracy evaluation. In the past decade, grand challenges have become commonplace, and their utility for accelerating the pace of research has become broadly accepted.

In this panel discussion we will explore the roles and potential of grand challenges from the perspective of funding agencies, academic institutes, and commercial companies. The panel and the audience will hypothesize on the key components of a successful grand challenge, and they will identify resources and research gaps related to conducting and evaluating grand challenges. SPIE MI attendees interested in operating, participating on, or improving grand challenges are encouraged to attend.

Computer-Aided Diagnosis
Conference 9035
Tuesday 8:00 to 9:40 am
Location: Golden West

PANEL DISCUSSION

CAD Successes and Failures

The CAD field has been the inspiration for significant advances is image processing, machine learning, user interfaces, experimental design, clinical systems integration, and many other areas. However, as with every form of science, there have been CAD failures, and often as much is learned from our failures as from our successes. This panel discussion will provide a forum for leaders in academia and industry to present their most significant successes and failures. The goal of the panel discussion is for the panel members and the audience to collaboratively discover the common threads that permeate the panel members' experiences. The expectation is that such discoveries will help the field continue to grow along the most productive trajectories while also identifying new areas of exploration that exist in the gaps between the successes and failures discussed.

PACS and Imaging Informatics: Next Generation and Innovations
Conference 9039
Thursday 10:10 am to 12:10 pm
Location: Royal Palm One

SPECIAL SESSION:

Radiology for the Non-Radiologists

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

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. The second half will open the session to questions from the audience about research innovations that may help to address some of these challenges.

SOCIAL NETWORKING EVENTS

Women's Networking Lunch

Tuesday 12:10 to 1:20 pm
Lunch tickets required.

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

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

Dessert with the Experts - A Student Networking Event

Monday 6:30 to 7:30 pm
First come, first served.

Enjoy a tasty dessert and casual atmosphere while networking with some of the best and brightest minds in medical imaging. Exchange ideas, share experiences, and make valuable contacts at this complimentary student event.

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Conference Keynote Presentations

Don't miss these world-class speakers talking on the latest directions and most promising breakthroughs.

Plenary Sessions are open to all paid conference attendees. *See full descriptions and updates online.*

Physics of Medical Imaging

Conference 9033
Monday 8:00 am
Location: Town & Country

Noninvasive Functional Assessment of Coronary Artery Disease using Cardiac CT Imaging and Computational Fluid Dynamics [9033-1]

Charles A. Taylor,
HeartFlow, Inc. (USA)

Heart disease resulting from atherosclerosis in the coronary arteries is the cause of nearly one-third of all global deaths. The severity of coronary artery disease and the consequent effect on blood flow to the heart are difficult to measure, yet this information is critical for treating patients. Currently, the gold-standard for assessing the functional significance of coronary artery disease involves invasive measurement of pressure in the coronary arteries at the time of diagnostic cardiac catheterization, but this procedure is expensive and poses risk to the patient. A recent breakthrough in imaging technologies with CT scanners and computational fluid dynamics is enabling an inexpensive and potentially safer diagnostic tool to emerge. Broad application of this technology could reduce annual health care costs nationally by billions of dollars and save thousands of lives each year. Based on research funded by the National Science Foundation and the National Institutes of Health, HeartFlow is able to analyze a patient's coronary CT scan images and, using high performance computing and computational fluid dynamics, to solve for coronary blood flow and pressure. Clinical data has demonstrated significant improvements in diagnostic accuracy as compared to other noninvasive technologies. HeartFlow employs a service model whereby patient data is uploaded through a secure web browser, processed on-site using custom software and high performance computing platforms and transmitted back to the ordering physician through a secure web browser. This analysis enables the physician to quickly determine the best treatment without invasive diagnostic cardiac catheterization.

Biography: **Dr. Taylor** is a co-founder, Chief Technology Officer (CTO), and member of the Board of Directors of HeartFlow Inc. Previously, he was an Associate Professor in the Department of Bioengineering and Surgery at Stanford University with courtesy faculty appointments in the Departments of Mechanical Engineering and Radiology.

Image Processing

Conference 9034
Monday 1:20 pm
Location: San Diego

Large Scale Digital Atlases in Neuroscience [9034-34]

Michael J. Hawrylycz,
Allen Institute for Brain Science (USA)

Imaging in neuroscience has revolutionized our current understanding of brain structure, architecture and increasingly its function. Many characteristics of morphology, cell type, and neuronal circuitry have been elucidated through methods of neuroimaging. Combining this data in a meaningful, standardized, and accessible manner is the scope and goal of the digital brain atlas. Digital brain atlases are used today in neuroscience to characterize the spatial organization of neuronal structures, for planning and guidance during neurosurgery, and as a reference for interpreting other data modalities such as gene expression and connectivity data.

The field of digital atlasing is extensive and in addition to atlases of the human includes high quality brain atlases of the mouse, rat, rhesus macaque, and other model organisms. Using techniques based on histology, structural and functional magnetic resonance imaging as well as gene expression data, modern digital atlases use probabilistic and multimodal techniques, as well as sophisticated visualization software to form an integrated product. Toward this goal, brain atlases form a common coordinate framework for summarizing, accessing, and organizing this knowledge and will undoubtedly remain a key technology in neuroscience in the future.

Since the development of its flagship project of a genome wide image-based atlas of the mouse brain, the Allen Institute for Brain Science has used imaging as a primary data modality for many of its large scale atlasing projects. We present an overview of the field of digital atlases in neuroscience, with a focus on the challenges and opportunities for image processing and computation..

Biography: **Mike Hawrylycz, Ph.D.** is an Investigator at the Allen institute for Brain Science in Seattle, WA. As member of the Allen Institute since its beginning in 2003 he has led the informatics and data annotation efforts of many of the basic atlases. More recently as Director of the Modeling, Analysis, and Theory Group his group is responsible for modeling and data analysis strategies for the Institute's next generation projects. He has worked in a variety of areas of applied mathematics and computer science.

Computer-Aided Diagnosis

Wednesday 8:00 am

PACS and Imaging Informatics

Wednesday 8:45 am

Location: Golden West

Joint Keynote Session: Conferences 9035 and 9039

Opportunities and Challenges for Diagnostic Decision Support Systems [9035-1]

Nico Karssemeijer,
Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

More than ten years after the successful introduction of computer aided detection (CAD) systems for mammography, expectations among radiologists about the potential of CAD have been lowered considerably. Development of mammography CAD has been stalled for many years and new successful applications have not emerged. Despite a strong increase in CAD research in academic centers, translation from research to clinical practice appears to be highly challenging. In this talk some major causes for the low acceptance of CAD will be discussed. But prospects for large scale use of intelligent software in medical imaging remain good. Developers have to move away though from existing paradigms and explore novel ways to assist clinicians in image interpretation and diagnostic decision making. For instance, it is well known that in many tasks two readers perform better than a single reader. Hence, the value of CAD as a second reader should be evident if CAD on its own was as good as a reader. Unfortunately, this is not yet the case for the majority of CAD applications. Thus, a major challenge will be the improvement of CAD algorithms to reach at least the performance of experienced human readers. Challenges further include integration of CAD in the clinical workflow and improvement of the regulatory process. When these challenges can be overcome, there are big opportunities for automated diagnostic support systems. The availability of huge imaging data archives, quantitative imaging techniques, and increasing knowledge in machine learning will contribute to the development of effective CAD systems in many domains, including radiology, ophthalmology, and pathology.

Biography: **Nico Karssemeijer** is professor of Computer-Aided Diagnosis at the Radboud University Niijmegen in the Netherlands. He is employed by the department of Radiology of the Radboud University Nijmegen Medical Center, where he is co-chairing the Diagnostic Image Analysis Group (DIAG), and also works for Fraunhofer MEVIS (Bremen, Germany).

Re-thinking CAD for the Next Generation [9039-1]

Eliot L. Siegel,
Univ. of Maryland School of Medicine (USA)

Computer aided detection algorithms have been utilized in radiology for more than two decades, and research about their efficacy has been promising, such as a paper published in Radiology in 1994 suggesting 100% sensitivity and 82% specificity in the detection of spiculated breast cancers. Clinical utilization of CAD, however has plateaued and has largely been limited to mammography. A 2013 SPIE session that focused on challenges in CAD commercialization underscored the fact that despite the large corpus of previous and active research on CAD, incorporation of this technology into clinical practice has been disappointingly slow. A Society of Breast imaging survey found that despite the high penetration of CAD, only 2% of respondents indicated that they always rely on CAD and approximately 50% indicated that they rarely or never rely on CAD in the diagnosis of cancer. The next generation of CAD will reflect the trend toward big data and personalized medicine and shift away from the current second reader approach and toward one in which CAD algorithms increasingly serve as visualization and image measurement/annotation and quantification tools. Computer algorithms will also be increasingly utilized to routinely provide "supplemental" information such as quantification of bone mineral density, interstitial lung disease severity, presence of an aortic aneurysm, coronary artery calcification score, and so on creating a supplemental but not necessarily displayed radiology report. This will allow radiology data to be discoverable by the increasing number of decision support algorithms that will be incorporated into the routine practice of medicine.

Biography: **Dr. Eliot Siegel** is Professor and Vice Chairman at the University of Maryland School of Medicine Department Of Diagnostic Radiology And Nuclear Medicine and Chief of Imaging for the VA Maryland Healthcare System. He pioneered the first filmless radiology department at the Baltimore VA Medical Center and has served as the SPIE Medical Imaging Symposium chair and PACS conference chair in the past.

Image-Guided Procedures, Robotic Interventions, and Modeling

Conference 9036
Wednesday 1:20 pm
Location: California

Engineering Therapeutic Processes: From Research to Commodity [9036-32]

Robert L. Galloway,
Vanderbilt Univ. (USA)

Three of the most important forces driving medical care are: patient specificity, treatment specificity and the move from discovery to design. Engineers while trained in specificity, efficiency, and design are often not trained in either biology or medical processes. Yet they are increasing critical to medical care. For example, modern medical imaging at US hospitals generates 1 exabyte (1018 bytes) of data per year clearly beyond unassisted human analysis. It is not desirable to involve engineers in the acquisition, storage and analysis of this data, it is essential. While in the past we have nibbled around the edges of medical care, it is time and perhaps past time to insert ourselves more squarely into medical processes, making them more efficient, more specific and more robust. This requires engineers who understand biology and physicians who are willing to step away from classic medical thinking to try new approaches. But once the idea is proven in a laboratory, it must move into use and then into common practice. This requires additional engineering to make the process robust to noisy data and imprecise practices as well as workflow analysis to get the new technique into operating and treatment rooms. True innovation and true translation will require physicians, engineers, other medical stakeholders and even corporate involvement to take a new, important idea and move it not just to a patient but to all patients

Biography: **Robert L. Galloway, Jr. (Bob)** is a Professor of Biomedical Engineering, Professor of Neurosurgery and Professor of Surgery at Vanderbilt University. The majority of his 30 year career has been focused on the design, validation and translating of devices for therapeutic interventions. He holds a PhD and BSE from Duke University and a ME from the University of Virginia all in Biomedical Medical Engineering. He is the founder of Pathfinder Therapeutics Inc.

Image Perception, Observer Performance, and Technology Assessment

Conference 9037
Sunday 8:00 am
Location: California

Visual Search from Lab to Clinic and Back [9037-1]

Jeremy Wolfe,
Harvard Medical School and Brigham and Women's Hospital (USA)

Many of the tasks of medical image perception can be understood as demanding visual search tasks (especially if you happen to be a visual search researcher). In this talk I will discuss the profitable dialogue between the practical demands of search in radiology and the fundamental principles of search, uncovered by basic research in visual attention. There are three 'take-home' messages. (1) Humans have a search engine that comes with impressive capabilities and equally impressive limitations. (2) Medical image perception tasks are imperfectly matched to those capabilities and can be vulnerable to those limitations. (3) Introspection, even by highly-trained experts, is not an adequate guide to performance in radiological search tasks. These 'messages' will be illustrated with examples from the clinic and the lab.

Biography: **Jeremy M Wolfe, PhD,** is Professor of Ophthalmology and Radiology at Harvard Medical School. In addition, he is a Senior Lecturer in the Department of Brain and Cognitive Sciences at MIT and an Adjunct Associate Professor in Cognitive and Neural Systems at Boston University. He received his AB in 1977 from Princeton and his Ph.D. in Psychology from MIT in 1981.

He is the Director of the Visual Attention Lab and the Center for Advanced Medical Imaging at Brigham and Women's Hospital in Boston. He is one of the world's leading researchers in the areas of visual perception and visual search. His research is supported by funding from, among others, the US National Institutes of Health, Office of Naval Research, Toshiba and the Department of Homeland Security. His research focuses on understanding visual search mechanisms and visual attention and their application in diverse areas, such as airport security and medical screening

Biomedical Applications in Molecular, Structural, and Functional Imaging

Conference 9038
Monday 10:10 am
Location: Royal Palm One

Advancing Technologies for Preclinical Molecular Imaging [9038-25]

Simon R. Cherry,
Univ. of California, Davis (USA)

In vivo molecular imaging technologies have become an indispensable and widely utilized tool for studying animal models of human disease, and in preclinical evaluation of novel therapeutic strategies. The use of highly sensitive assays based on optical or radiotracer methods provide the foundation for many of the existing and emerging technologies used to provide images that elucidate the spatial and temporal distribution of gene expression and protein targets, and that can be used to probe a variety of molecular and metabolic pathways. Many approaches also offer opportunities for clinical translation.

This presentation will review a selection of technologies being used or developed for in vivo molecular imaging, with a focus on highly sensitive radiotracer assays. Recent trends will be explored, including the development of sub-mm positron emission tomography (PET scanners, hybrid systems that integrate PET and magnetic resonance imaging (MRI), optical imaging of radiotracers via Cerenkov luminescence, and high sensitivity single photon imaging without the use of any physical collimation. The strengths and weakness of different approaches will be discussed and a number of remaining challenges in the field identified.

Biography: **Simon R. Cherry** is Professor in the Department of Biomedical Engineering and Director of the Center for Molecular and Genomic Imaging at UC Davis. Dr. Cherry's research interests center around the development and application of vivo molecular imaging systems. Dr. Cherry is a founding member of the Society of Molecular Imaging and a fellow of five professional societies, including the Institute for Electronic and Electrical Engineers (IEEE). He is Editor-in-Chief of the journal Physics in Medicine and Biology. Dr. Cherry is the author of more than 200 peer-reviewed journal articles. He is also co-author of the textbook "Physics in Nuclear Medicine."

Ultrasonic Imaging and Tomography

Conference 9040
Wednesday 10:10 am
Location: San Diego

Advances in Acoustic Microscopy and High Resolution Ultrasonic Imaging: from Principles to New Applications [9040-6]

Roman G. Maev,
Univ. of Windsor (Canada)

The goal of this lecture is to provide an overview of the recent advances in high-resolution ultrasonic imaging principles and techniques and their applications to biomaterials evaluation and industrial materials. This lecture will offer a number of new results from leading research groups worldwide who are engaged in aspects of the development of novel physical principles, new methods, or the implementation of modern technological solutions into current high resolution imaging techniques and methods.

Together with the above mentioned academic and practical avenues in high resolution ultrasonic imaging research, will also be offered intriguing scientific discussions which have recently surfaced and will hopefully continue to bear fruit in the future.

One more goal of this lecture is to encourage a new generation of researchers to be more involved in research and development in the field to realize the great potential of high resolution acoustic imaging and advance the progress into its various biomedical applications.

Biography: **Dr. Roman Gr. Maev** is the founding Director-General of The Institute for Diagnostic Imaging Research - a multi-disciplinary, collaborative research and innovation consortium. Dr. Maev is also a full faculty professor in the Department of Physics at the University of Windsor, Canada, and in 2007 was granted the title of University Professor Distinguished.

Digital Pathology

Conference 9041
Sunday 1:20 pm
Location: Golden West

Path, Present and Future [9041-1]

Richard Levenson,
Univ. of California, Davis (USA)

The talk will describe the traditional practice of pathology, with examples of how morphological diagnoses, still the mainstay of patient care, are actually arrived at. Then the role(s) of biomarkers—molecular indicators—currently used to explore the complexity of cancer and the specific threats and vulnerabilities of individual tumors will be discussed. Such biomarkers are being tied to the deployment of novel therapeutics and will gate many future decisions as to which patients will (or will not) be treated by what drugs. There is a contest of sorts between tissue-extract-based tests (including proteomics and nucleic acid analyses) that can be both precise and highly multiplexed (tens to thousands of analytes) but are largely devoid of spatial context, and microscopic imaging based assays (like immunohistochemistry) that can have resolution down to the subcellular scale, but can deliver only modest levels of multiplexing. Novel instrumentation, reagents, and importantly, software (including machine learning and artificial intelligence), can help deliver both increasingly reliable assessments of pure morphology-associated features of pathology specimens, in some cases outperforming pathologists, and can also generate accurate and multiplexed, spatially resolved, molecular phenotypes. However, harder than the science and engineering challenges may be the problem of actually deploying such tools in a changing medical, financial and legal landscape.

Biography: **Richard Levenson, MD, FCAP**, is Professor and Vice Chair for Strategic Technologies in the Department of Pathology and Laboratory Medicine, UC Davis. He trained in medicine at University of Michigan and pathology at Washington University, and is Board-certified in Anatomic Pathology.

These technical workshops are included with your registration.

Sunday Workshops · 5:45 to 7:45 pm

Methods and Application of Brain Connectivity

Conference 9034: Image Processing
Location: San Diego

Workshop Chair: **Martin Styner,** The Univ. of North Carolina at Chapel Hill (USA)

Speakers/Panel Members:

Alan Evans, Montreal Neurological Institute, McGill Univ. (Canada)

Wei Gao, Univ. of North Carolina (USA)

David Van Essen, Univ. of Washington at St. Louis (USA)

Archana Venkataraman, Massachusetts Institute of Technology/ Harvard Univ. (USA)

It was only 20 years ago that many neuroscientists lamented the fact that human neuroanatomy was backward. They would be astonished to see the progress achieved via brain connectivity analyses from sophisticated MR imaging and corresponding analysis techniques. This workshop will present a field of four speakers of established and upcoming leaders in the field of Brain Connectivity analysis. Their talks will cover topics of the Human Connectome Project, structural connectivity, resting state functional connectivity and diffusion imaging based connectivity.

Dose, Risk and Task Performance

Conference 9037: Image Perception, Observer Performance, and Technology Assessment

Location: California

Workshop Chair: **Matthew A. Kupinski,** The Univ. of Arizona (USA)

Speakers/Panel Members:

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

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

Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany)

The purpose of this workshop is to briefly survey our current knowledge of how radiation dose relates to image quality and patient risk, thereby laying the groundwork for a rigorous risk-benefit analysis applicable to such important medical modalities as mammography, nuclear medicine and computed tomography.

The theory of task-based assessment of image quality will be briefly reviewed, with emphasis on imaging with ionizing radiation, and objective figures of merit (FOMs) for image quality will be summarized. The variation of the FOMs with the task, the observer and especially with the mean number of photons recorded in the image will be discussed. Then various standard methods for specifying radiation dose are reviewed and related to the mean number of photons in the image and hence to image quality. Current knowledge of the relation between local radiation dose and the risk of various adverse effects will be summarized, and some graphical depictions of the tradeoffs between image quality and risk are introduced. Finally, the mathematical and computational tools available for carrying out these analyses will be summarized, and the research still needed to apply these tools fully discussed.

This workshop will consist of presentations by the panelists designed to summarize the important topics in these fields and to introduce methods of objectively combining risk and image quality. The presentations are intended to set the stage for a lively discussion on the topics of dose, risk and task performance.

This workshop may be of particular interest to the Physics of Medical Imaging participants.

The Evolution of Preclinical Molecular Imaging

Conference 9038: Biomedical Applications in Molecular, Structural, and Functional Imaging
Location: Royal Palm One

Workshop Chair: **Mohammed Farhoud,** Sofie Biosciences, Inc. (USA)

A look at past and current instrumentation used for preclinical in vivo molecular imaging. A discussion on what trends are driving molecular imaging instrumentation.

An overview on current models for establishing an imaging core. An evaluation of the driving forces for behind creating imaging cores.

Panel Members:

Mohammed Farhoud, Sofie Biosciences, Inc. (USA)
What Trends are Driving Preclinical Molecular Imaging Instrumentation?

Melissa Moore, Sofie Biosciences, Inc. (USA)
Trends in Radiochemistry

Robert Molthen, Medical College of Wisconsin (USA)
Preclinical Applications and Multi-Institutional Collaborations

What do pathologists see on a slide?: Implications for Digital Pathology

Conference 9041: Digital Pathology
Location: Golden West

Workshop Chairs: **Metin Gurcan,** The Ohio State University (USA)
Anant Madabhushi, Case Western Reserve Univ. (USA)

Panel Members:

John Tomaszewski, Univ. of Buffalo (USA)

Michael Feldman, Univ. of Pennsylvania (USA)

Ulysses Balis, Univ. of Michigan (USA)

Richard Levenson, Univ. of California, Davis Medical Center (USA)

This workshop will focus on the reading process of pathologists in current clinical practice and how it may change in the near future with the introduction of digital pathology. The panelists are academic pathologists with an average of 20 years of experience each. They will take the audience through their process of reading and interpreting digitized slides of breast, lung, prostate cancers pathology specimens, and discuss their thinking process and workflow. Then, they will share their experience and thoughts with digital pathology and how computerized image analysis tools can be helpful. It is expected that this event will be of interest to anyone interested in the field of anatomic pathology and more specifically to those members of the SPIE community with an interest in developing computer based image analysis tools for quantitative interpretation of digitized glass slides.

NON TECHNICAL WORKSHOP

Understanding the NIH Peer Review System Relative When Competing for Grant Awards

Location: Royal Palm Six

Workshop Chairs: **Lee Rosen,** Ctr. for Scientific Review, NIH
Marie Gill, National Institute of Biomedical Imaging and Bioengineering (USA)

Speakers: **NIH Staff and Principal Investigators**

This workshop will focus on the Peer Review System at NIH with emphasis on the important issues raised during review concerning good and bad grant applications. Participants will learn about the important skills and features associated with the art form of grantsmanship, which are needed to write competitive applications for funding from the NIH. The workshop will be led by staff members from the National Institutes of Health and speakers will include successful grantees speaking on how they approached the problem of preparing grant applications. Presentations will explore the peer review process, including how to structure, write, and fine-tune a competitive application for funding consideration. Included will be a mock review of real grants by scientists, demonstrating the peer review process and what factors are associated with assessing the strengths and weaknesses of applications. Finally, a presentation will address institute announcements and available funding at NIH.

TOPICS:

- The NIH grant application review process
- Contacting appropriate NIH Program staff
- Finding the right study section to review your application
- Developing a compelling problem statement or hypothesis
- Presenting a significant or innovative idea
- Technology-driven applications
- Varieties of grant mechanisms (R03, R21, R01, training grants, etc.)
- What to include in a cover letter

Monday Workshop · 1:30 to 3:30 pm

Meet with NIH Staff

Location: Royal Palm Four

Meet with NIH staff to discuss your specific grant proposals.

This session allows investigators to meet with individual NIH staff members one-on-one to discuss specific questions about NIH grant applications and the grant review process. Participants interested in briefly discussing their grant proposals with an NIH staff member should come prepared with a short list of Specific Aims.

In addition, investigators can ask questions about:

- NIH support for scientific areas: Image processing, computer-aided diagnosis, image-guided procedures, imaging informatics, imaging technologies, structural/functional/molecular imaging, optical imaging, ultrasound, MRI, PET, etc.*?]
- Grant mechanisms: R03, R21, R01, etc.
- Training grant opportunities: Career (K) and Pathway to Independence Awards (K99-R00), Fellowships (F awards), support for non-U.S. citizens
- Review and application process of the NIH

WHO SHOULD ATTEND:

- New investigators, early-career scientists and seasoned grant applicants who want to learn about new initiatives, funding opportunities and how to increase their possibilities of funding
- Grantees interested in hearing about the NIH review system
- Academics

These technical workshops are included with your registration.

Tuesday Workshops · 5:00 to 7:00 pm

X-ray Sources

Conference 9033: Physics of Medical Imaging

Location: Town & Country

Workshop Chairs: **Bruce Whiting,** Univ. of Pittsburgh (USA)
Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany)

Panel Members:

Carlos Camara, Tribogenics (USA)

Hans Hertz, KTH Royal Institute of Technology (Sweden)

Carey S. Rogers, GE Healthcare (USA)

Ronald D. Ruth, Lyncean Technologies, Inc. (USA)

Otto Z. Zhou, The Univ. of North Carolina at Chapel Hill (USA)

The performance of any x-ray imaging system ultimately depends on the generation of x-rays, which are characterized by properties such as, e.g., brilliance, emitted energy spectrum, focal spot size, coherence, switching speed, efficiency, cost, etc. This workshop will review the state of the art for conventional x-ray tubes and their ultimate limits, then present novel technologies being developed for anodes (liquid metal jets), cathodes (switchable carbon nanotubes), desktop synchrotrons (for high spatial coherence with continuously tunable energy spectrum), and triboelectric generation (for compact, low cost sources). Included will be statements about the intended use and possibilities for the novel sources. An open discussion will follow presentations by panel members.

CALL FOR PARTICIPATION

Live Demonstrations

Conference 9035: Computer-Aided Diagnosis

Location: Grand Exhibit Hall

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, Visualization, and all other conferences to participate.

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

Commercialization of Medical Research

Conference 9036: Image-Guided Procedures, Robotic Interventions, and Modeling

Location: California

Workshop Chairs: **Guy Shechter,** Philips Healthcare (USA)
Ziv R. Yaniv, Children's National Medical Center (USA)

Panel Members/Speakers:

Frank Sauer, Siemens Corp., Corporate Technology (USA)

Eric J. Seibel, Univ. of Washington (USA)

Joerg Traub, SurgicEye GmbH (Germany)

What motivated you to pursue research in a field that can have a profound impact on improving someone else's life? Improving the health of humanity? Personal fame and fortune? Whatever the answer, there's a good chance that you have already contemplated what it would take to translate the innovations you have developed from research prototypes to clinically adopted products. The good news is that there are a number of pathways for commercializing your ideas, from creating your own startup to licensing your technology to an established vendor. In this workshop, we have gathered a panel of current and former researchers who will share some of their personal experiences and observations to help you understand how to develop a commercialization strategy.

DICOM

Conference 9039: Advanced PACS-based Imaging Informatics and Therapeutic Applications

Location: Royal Palm One

Workshop Chair: **Steven C. Horii,** The Univ. of Pennsylvania Health System (USA)

The DICOM Workshop will include a brief overview of the major new material in the DICOM Standard. Detailed discussions of the new material in the Standard as well as an explanation of some of the ongoing debates over expansion of the Standard to cover new types of images will be guided by the most recent Working Group activities. There will be an opportunity to ask questions of the presenters and the other DICOM experts in attendance.

Attendees of the workshop should have some familiarity with the DICOM standard and may expect to learn about the newest developments and directions from the participants in the DICOM effort.

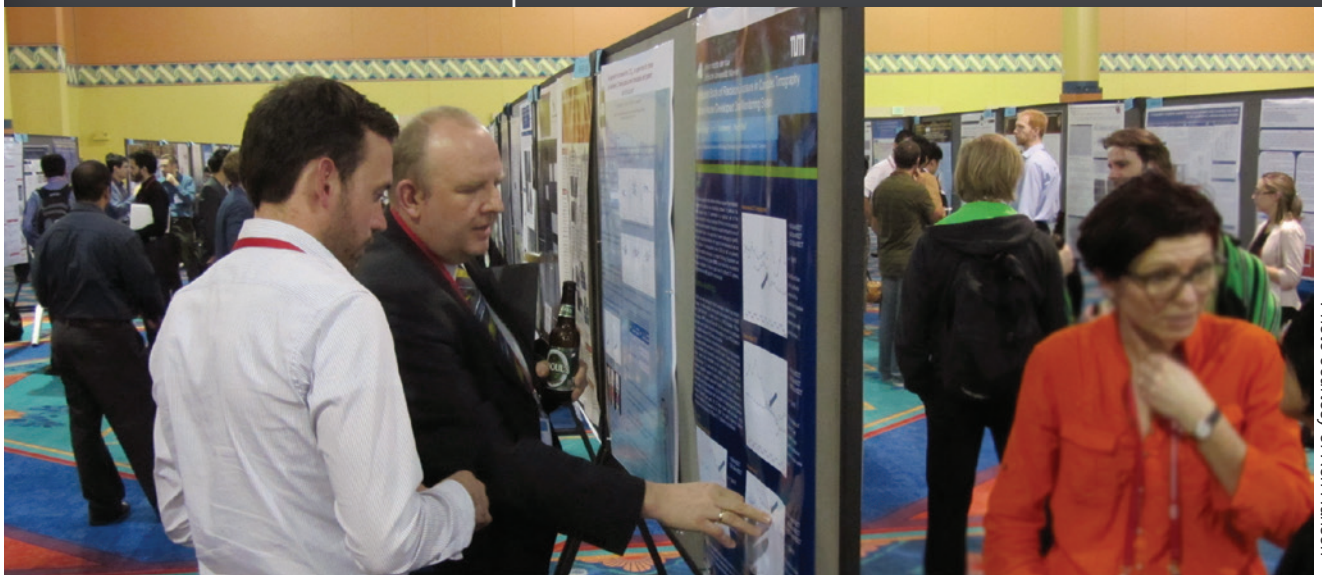


Photo courtesy of Ken Hanson

2014 Conference Awards

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

Conf. 9033—Physics of Medical Imaging

Student Paper Award sponsored by: Carestream

Poster Award sponsored by: imagination at work

Conf. 9036—Image-Guided Procedures, Robotic Interventions, and Modeling

Young Scientist Award sponsored by: SIEMENS

Poster Session Information

Location: Grand Exhibit Hall

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

SUNDAY/MONDAY POSTER SESSION

Poster presentations from the 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: Sunday starts at 12:00 pm

Posters should remain on display until the end of the Interactive Poster Session on Monday and may remain on display for extended viewing until 9:00 pm.

Interactive Poster Session and Reception:
Monday from 5:15 to 6:45 pm

TUESDAY/WEDNESDAY POSTER SESSION

Poster presentations from the Physics of Medical Imaging; Computer-Aided Diagnosis; Image-guided Procedures, Robotic Generation and Innovations; and Ultrasonic Imaging and Tomograph 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 and may remain on display for extended viewing until 9:00 pm.

Interactive Poster Session and Reception:
Wednesday from 5:30 to 7:00 pm

NOTE: Extended poster viewing until 9:00 pm on all poster session days. Posters not removed by the end of extended viewing will be discarded.

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.

2014 Poster Awards Information

Poster Awards in Conference Rooms

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

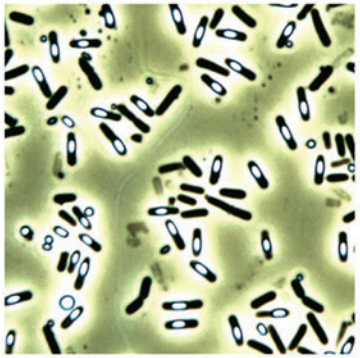
The winning posters will be identified during the receptions with award ribbons. Winners will be recognized and certificates distributed in the conference meeting rooms. See conference schedules for times and locations.

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.



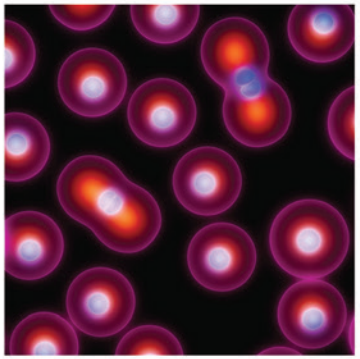
MICROSCOPY

SPECTROSCOPY

IMAGING

OPTICS

LASERS



BIOPHOTONICS

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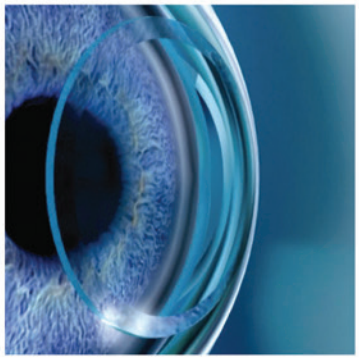

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ROC Analysis and Observer Studies to Evaluate Imaging Technology NEW

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.

NOTE: 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.

Non-diffraction Computed Tomography Image Analysis NEW

SC1128 · Course Level: Intermediate · CEU: 0.35
$360 Members | $410 Non-Members USD
Sunday 8:30 am to 12:30 pm

Instructor: **Tianhu Lei**

Medical imaging modalities: x-ray CT, MRI, PET, SPECT, and some US imaging, belong to the non-diffraction computed tomography (CT), in which the interaction model and the external measurements are characterized by straight line integrals of some indexes of the object and the image reconstruction is based on Fourier Slice theorem.

Statistical properties at four levels of image appearances: a single pixel – Gaussianity; any two pixels – spatially asymptotical independency, exponential correlation coefficient; a group of pixels – Markovianity, stationary, ergodicity; and the entire image – Finite normal mixture, are derived for each modality and showed to be same for all non-diffraction CT. These common properties lead to a unified stochastic image model and the model – based image analysis technique.

Comparing with other image analysis methods such as Graph approach, Classical snake and Active contour, Level set, ASM and AAM, FC object delineation, and MRF-based methods, this image analysis method possesses many analytic and computational advantages. Quantitative evaluations of its performance not only provide the theoretically approachable accuracy limits of this method, but also give the practically achievable performance for the given images.

Theoretical developments, computational algorithms, and results from simulation, phantom images, and real medical images of different modalities of non-diffraction CT obtained by using this image analysis method are given in detail.

Photon Counting X-ray maging: Technology and Methods NEW

SC1129 ·Course Level: Introductory · CEU: 0.35
$360 Members | $410 Non-Members USD
Sunday 1:30 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 are also discussed.

Registration Required.
See SPIE Cashier to register.

Fundamentals of Medical Image Processing and Analysis

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

Instructor: **Thomas Deserno**

THIS COURSE IS ALSO AVAILABLE IN ONLINE FORMAT

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.

Graph Algorithmic Techniques for Biomedical Image Segmentation

SC1026 · Course Level: Intermediate· CEU: 0.35
$360 Members | $410 Non-Members USD
Wednesday 8:30 am to 12:30 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.

Radiation Dose in CT

SC1064 · Course Level: Introductory · CEU: 0.35
$360 Members | $410 Non-Members USD
Saturday 1:30 to 5:30 pm

Instructor: **Michael McNitt-Gray** Ph.D.

Radiation dose from CT has continued to be a concern, especially to the medical imaging community. Recent high profile events (CT being identified as the largest single source of medical radiation to the US population, widely reported overexposure incidents, etc.) have sparked action by national and international groups (NIH, FDA, IAEA, and ACR) as well as legislation in California. The purpose of this course is to cover several areas of interest with respect to radiation dose from CT. This course will describe methods being used to measure and report radiation dose in CT, methods to estimate radiation dose to patients as well as scanner technologies that have been used to reduce radiation dose in CT exams.

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 to 5:30 pm

Instructor: **Ian Cunningham**

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

SC471 · Course Level: Introductory · CEU: 0.35
$450 Members | $500 Non-Members USD
Saturday 8:30 am to 12:30 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.

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** and **Thomas Flohr**

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 postprocessing. 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
Saturday 1:30 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 8:30 am to 12:30 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.

Conference 9033

Room: Town & Country

Monday–Thursday 17–20 Feb. 2014
Proceedings of SPIE Vol. 9033

Physics of Medical Imaging

Conference Chairs: **Bruce R. Whiting,** Univ. of Pittsburgh (USA); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany)

Conference Co-Chair: **Despina Kontos,** The Univ. of Pennsylvania Health System (USA)

Program Committee: **Andreu Badal,** U.S. Food and Drug Administration (USA); **Kirsten Boedeker,** Toshiba Medical Research Institute USA (USA); **Hilde Bosmans,** Univ. Hospitals of KU Leuven (Belgium); **Guang-Hong Chen,** Univ. of Wisconsin School of Medicine and Public Health (USA); **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden); **Mini Das,** Univ. of Houston (USA); **Maria Drangova,** Robarts Research Institute (Canada), Univ. of Western Ontario (Canada); **Thomas G. Flohr,** Siemens Healthcare (Germany), Eberhard Karls Univ. Tübingen (Germany); **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA); **Michael Grass,** Philips Research (Germany); **Marc Kachelrieß,** Germany Cancer Research Ctr. (DKFZ) (Germany); **Karim S. Karim,** Univ. of Waterloo (Canada); **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Joseph Y. Lo,** Duke Univ. (USA); **Robert M. Nishikawa,** Univ. of Pittsburgh (USA); **Norbert J. Pelc,** Stanford Univ. (USA); **Jinyi Qi,** Univ. of California, Davis (USA); **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada); **John M. Sabol,** GE Healthcare (USA); **Taly G. Schmidt,** Marquette Univ. (USA); **Anders Tingberg,** Lund Univ. (Sweden); **John Yorkston,** Carestream Health Technology and Innovation Ctr. (USA)

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

9033 continues on page 31

Conference 9034

Room: San Diego

Sunday–Tuesday 16–18 Feb. 2014
Proceedings of SPIE Vol. 9034

Image Processing

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

Program Committee: **Paul Aljabar,** King's College London (UK); **Mostafa Analoui,** The Livingston Group, LLC (USA); **Elsa D. Angelini,** Telecom ParisTech (France), Columbia Univ. (USA); **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr. (USA); **Christian Barillot,** IRISA / INRIA Rennes (France); **Benoit M. Dawant,** Vanderbilt Univ. (USA); **Baowei Fei,** Emory Univ. (USA); **Aaron Fenster,** Robarts Research Institute (Canada); **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Mona K. Garvin,** The Univ. of Iowa (USA); **James C. Gee,** Univ. of Pennsylvania (USA); **Guido Gerig,** The Univ. of Utah (USA); **David R. Haynor,** Univ. of Washington (USA); **Tobias Heimann,** Siemens AG (Germany); **Bennett A. Landman,** Vanderbilt Univ. (USA); **Tianhu Lei,** Univ. of Pittsburgh Medical Ctr. (USA); **Boudewijn Lelieveldt,** Leids Univ. Medisch Ctr. (Netherlands); **Murray H. Loew,** The George Washington Univ. (USA); **Cristian Lorenz,** Philips Medizin Systeme GmbH (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,** Univ. of Copenhagen (Denmark); **Wiro Niessen,** Erasmus Univ. Medical Ctr. (Netherlands), Delft Univ. of Technology (Netherlands); **Brian S. Nutter,** Texas Tech Univ. (USA); **Josien P. W. Pluim,** Univ. Medical Ctr. Utrecht (Netherlands); **Jerry Prince,** Johns Hopkins Univ. (USA); **Sonia Pujol,** Harvard Medical School (USA), Brigham and Women's Hospital (USA); **Punam K. Saha,** The Univ. of Iowa (USA); **Olivier Salvado,** CSIRO (Australia); **Julia A. Schnabel,** Univ. of Oxford (UK); **Philippe Thévenaz,** École polytechnique fédérale de Lausanne (Switzerland); **Jayaram K. Udupa,** The Univ. of Pennsylvania Health System (USA); **Tomaž Vrtovec,** Univ. of Ljubljana (Slovenia); **Andreas Wahle,** The Univ. of Iowa (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:15 to 6:45 pm. Poster awards will be announced in the conference meeting room. Check conference program for exact time.

9034 continues on page 22

Conference 9035

Room: Golden West

Tuesday–Thursday 18–20 Feb. 2014
Proceedings of SPIE Vol. 9035

Computer-Aided Diagnosis

Conference Chairs: **Stephen Aylward,** Kitware, Inc. (USA); **Lubomir M. Hadjiiski,** Univ. of Michigan Health System (USA)

Program Committee: **Samuel G. Armato III,** The Univ. of Chicago (USA); **Susan M. Astley,** The Univ. of Manchester (UK); **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), Univ. of Copenhagen (Denmark); **Thomas M. Deserno,** RWTH Aachen (Germany); **Catalin Fetita,** Telecom 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 K. Hahn,** Fraunhofer MEVIS (Germany), Jacobs Univ. Bremen (Germany); **Khan M. Iftekharuddin,** Old Dominion Univ. (USA); **Nico Karssemeijer,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Jong Hyo Kim,** Seoul National Univ. College of Medicine (Korea, Republic of); **Joseph Y. Lo,** Duke Univ. (USA); **Marius George Linguraru,** Children's National Medical Ctr. (USA), George Washington Univ. (USA); **Michael F. McNitt-Gray,** Univ. of California, Los Angeles (USA); **Kensaku Mori,** Nagoya Univ. (Japan); **Janne J. Näppi,** Massachusetts General Hospital (USA), Harvard Medical School (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 Sánchez,** Radboud Univ. Njimegan Medical Ctr. (Netherlands); **Ronald M. Summers,** National Institutes of Health (USA); **Kenji Suzuki,** The Univ. of Chicago (USA); **Georgia D. Tourassi,** Oak Ridge National Lab. (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 (USA); **Xiaofeng Yang,** Emory Univ. (USA)

Posters for this conference will be on display Tuesday and Wednesday inGrand Exhibit Hall. The interactive poster session will be Wednesday evening from 5:30 to 7:00 pm. Poster awards will be announced in the conference meeting room. Check conference program for exact time.

9035 continues on page 35

Conference 9036

Room: California

Tuesday–Thursday 18–20 Feb. 2014
Proceedings of SPIE Vol. 9036

Image-Guided Procedures, Robotic Interventions, and Modeling

Conference Chairs: **Ziv R. Yaniv,** Children's National Medical Ctr. (USA); **David R. Holmes III,** Mayo Clinic (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); **Steven L. Hartmann,** Medtronic Navigation (USA); **David R. Haynor,** Univ. of Washington (USA); **William E. Higgins,** The Pennsylvania State Univ. (USA); **Pierre Jannin,** Univ. de Rennes 1 (France); **David M. Kwartowitz,** Clemson Univ. (USA); **Lena Maier-Hein,** German Cancer Reserach Ctr. (DKFZ) (Germany); **Michael I. Miga,** Vanderbilt Univ. (USA); **Kensaku Mori,** Nagoya Univ. (Japan); **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); **Robert J. Webster III,** Vanderbilt Univ. (USA); **Jay B. West,** Accuray, Inc. (USA); **Ivo Wolf,** Hochschule Mannheim (Germany); **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ. (USA)

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

9036 continues on page 35

Conference 9037

Room: California

Sunday–Monday 16–17 Feb. 2014
Proceedings of SPIE Vol. 9037

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,** Lausanne Univ. Hospital (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,** 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 Sydney (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,** UZ Leuven (Belgium)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:15 to 6:45 pm. Poster awards will be announced in the conference meeting room. Check conference program for exact time.

9037 continues on page 22

Technical Conferences

Conference 9038

Room: Royal Palm One

Sunday - Tuesday 16–18 Feb. 2014
Proceedings of SPIE Vol. 9038

Biomedical Applications in Molecular, Structural, and Functional Imaging

Conference Chairs: **Robert C. Molthen,** Medical College of Wisconsin (USA); **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (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 Clough,** Marquette Univ. (USA); **Alejandro F. Frangi,** The Univ. of Sheffield (UK); **Barjor Gimi,** Geisel School of Medicine (USA); **Andreas H. Hielscher,** Columbia Univ. (USA); **Xiaoping P. Hu,** Emory Univ. (USA); **Xavier Intes,** Rensselaer Polytechnic Institute (USA); **Andrzej Krol,** SUNY Upstate Medical Univ. (USA); **John F. LaDisa,** Marquette Univ. (USA); **Armando Manduca,** Mayo Clinic College of Medicine (USA); **Erik Leo Ritman,** Mayo Clinic College of Medicine (USA); **Merryn H. Tawhai,** The Univ. of Auckland (New Zealand); **Nicholas J. Tustison,** Univ. of Virginia (USA); **Axel Wismüller,** Univ. of Rochester (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:15 to 6:45 pm. Poster awards will be announced in the conference meeting room. Check conference program for exact time.

9038 continues on page 22

Conference 9039

Room: Royal Palm One

Tuesday–Thursday 18–20 Feb. 2014
Proceedings of SPIE Vol. 9039

PACS and Imaging Informatics: Next Generation and Innovations

Conference Chairs: **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China); **Tessa S. Cook,** The Univ. of Pennsylvania Health System (USA)

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); **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); **Jianguo Zhang,** Shanghai Institute of Technical Physics (China)

WORKSHOP
DICOM
Royal Palm One · Tues. 5:00 to 7:00 pm
Workshop Chair:
Steven C. Horii, The Univ. of Pennsylvania Health System (USA)

For details see page 11.

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

9039 continues on page 48

Conference 9040

Room: San Diego

Wednesday–Thursday 19–20 Feb. 2014
Proceedings of SPIE Vol. 9040

Ultrasonic Imaging and Tomography

Conference Chairs: **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands); **Marvin M. Doyley,** Univ. of Rochester (USA)

Program Committee: **Jeffrey C. Bamber,** The Royal Marsden NHS Foundation Trust (UK); **Jan D'Hooge,** Katholieke Univ. Leuven (Belgium); **Neb Duric,** Delphinus Medical Technologies, Inc. (USA); **Stanislav Y. Emelianov,** The Univ. of Texas at Austin (USA); **James F. Greenleaf,** Mayo Clinic (USA); **Michael F. Insana,** Univ. of Illinois at Urbana-Champaign (USA); **Jørgen Arendt Jensen,** Technical Univ. of Denmark (Denmark); **Roman G. Maev,** Univ. of Windsor (Canada); **Stephen A. McAleavey,** Univ. of Rochester (USA); **Nicole V. Ruiter,** Karlsruher Institut für Technologie (Germany); **K. Kirk Shung,** The Univ. of Southern California (USA); **Kai E. Thomenius,** General Electric Co. (USA); **William F. Walker,** Univ. of Virginia (USA)

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

9040 continues on page 48

Conference 9041

Room: Golden West

Sunday–Monday 16–17 Feb. 2014
Proceedings of SPIE Vol. 9041

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); **Andrew H. Beck,** Harvard Medical School (USA), Beth Israel Deaconess Medical Ctr. (USA); **Rohit Bhargava,** Univ. of Illinois at Urbana-Champaign (USA); **Ulysses G. Balis,** Univ. of Michigan Health System (USA); **Eric Cosatto,** NEC Labs. America, Inc. (USA); **Andinet Enquobahrie,** Kitware, Inc. (USA); **Michael 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 Institutes of Health (USA); **Jason Hipp,** National Cancer Institute, NIH (USA); **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 Magee,** Univ. of Leeds (UK); **Anne L. Martel,** Sunnybrook Research Institute (Canada), Univ. of Toronto (Canada); **Erik Meijering,** Erasmus Univ. Medical Ctr. (Netherlands); **James P. Monaco,** VuCOMP (USA); **Tim W. Nattkemper,** Univ. Bielefeld (Germany); **Nasir M. Rajpoot,** Univ. of Warwick (UK), Univ. of Qatar (Qatar); **Badrinath Roysam,** Univ. of Houston (USA); **Berkman Sahiner,** U.S. Food and Drug Administration (USA); **John E. Tomaszewski,** Univ. at Buffalo (USA); **Darren Treanor,** Univ. of Leeds (UK), Leeds Teaching Hospitals NHS Trust (UK); **Martin J. Yaffe,** Sunnybrook Research Institute (Canada); **Bulent Yener,** Rensselaer Polytechnic Institute (USA)

Posters for this conference will be on display Sunday and Monday in Grand Exhibit Hall. The interactive poster session will be Monday evening from 5:15 to 6:45 pm. Poster awards will be announced in the conference meeting room. Check conference program for exact time.

9041 continues on page 24

Conference 9034 continued
Image Processing
Room: San Diego

SESSION 1

Room: San Diego . . . . . Sun 8:00 am to 9:40 am

OCT and Ultrasound

Session Chairs: **Aaron Fenster,** Robarts Research Institute (Canada); **Mona K. Garvin,** The Univ. of Iowa (USA)

8:00 am: **An adaptive grid for graph-based segmentation in retinal OCT**, Andrew Lang, Aaron Carass, Peter A. Calabresi, Howard S. Ying, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9034-1]

8:20 am: **Automated vessel shadow segmentation of Fovea-centered spectral-domain images from multiple OCT devices**, Jing Wu, Bianca S. Gerendas, Sebastian M. Waldstein, Christian Simader, Ursula Schmidt-Erfurth, Medizinische Univ. Wien (Austria) . . . . . [9034-2]

8:40 am: **Locally Constrained Active Contour: A Region-Based Level Set for Ovarian Cancer Metastasis Segmentation**, Jianfei Liu, Duke Univ. (USA); Jianhua Yao, Shijun Wang, National Institutes of Health (USA); Marius George Linguraru, Children's National Medical Ctr. (USA); Ronald M. Summers, National Institutes of Health (USA). . . . . [9034-158]

9:00 am: **Automatic nipple detection on 3D images of an automated breast ultrasound system (ABUS)**, Mandana Javanshir Moghaddam, Tao Tan, Nico Karssemeijer, Bram Platel, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9034-4]

9:20 am: **Cancer therapy prognosis using quantitative ultrasound spectroscopy and a kernel-based metric**, Mehrdad J. Gangeh, Univ. of Toronto (Canada) and Sunnybrook Health Sciences Ctr. (Canada); Amr Hashim, Anoja Giles, Gregory J. Czarnota, Sunnybrook Health Sciences Ctr. (Canada) . . . . . [9034-5]

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

9034 continues on page 23

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

SESSION 1

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

Keynote and Visual Search

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

8:00 am: **Visual search from lab to clinic and back** *(Keynote Presentation)*, Jeremy M. Wolfe, Harvard Medical School (USA) and Brigham and Women's Hospital (USA). . . . . [9037-1]

9:00 am: **Effect of mammographic breast density on radiologists' visual search pattern**, Dana Al Mousa, Patrick C. Brennan, Elaine Ryan, The Univ. of Sydney (Australia); Warwick B. Lee, Cancer Institute NSW (Australia); Mariusz W. Pietrzyk, Warren M. Reed, Maram M. Alakhras, Yanpeng Li, Claudia R. Mello-Thoms, The Univ. of Sydney (Australia). . . . . [9037-2]

9:20 am: **Laparoscopic surgical skills training: an investigation of the potential of using surgeons' visual search behavior as a performance indicator**, Yan Chen, Leng Dong, Alastair G. Gale, Loughborough Univ. (UK); Benjamin Rees, Charles Maxwell-Armstrong, Queen's Medical Ctr. (UK) . . . . . [9037-3]

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

9037 continues on page 23

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 1

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

General MR Techniques

Session Chairs: **Barjor Gimi,** Dartmouth Hitchcock Medical Ctr. (USA); **Alejandro F. Frangi,** The Univ. of Sheffield (UK)

8:00 am: **Abdominal adipose tissue quantification on water suppressed and non-water suppressed MRI at 3T using semi-automated FCM clustering algorithm**, Sunil Kumar Valaparla, The Univ. of Texas Health Science Ctr. at San Antonio (USA); Qi Peng, Albert Einstein College of Medicine (USA); Feng Gao, Geoffrey D. Clarke, The Univ. of Texas Health Science Ctr. at San Antonio (USA) . . . . . [9038-1]

8:20 am: **Accelerated self-gated UTE MRI of the murine heart**, Abdallah G. Motaal, Nils Noorman, Wolter DeGraaf, Luc Florack, Klaas Nicolay, Gustav J. Strijkers, Technische Univ. Eindhoven (Netherlands) . . . . [9038-2]

8:40 am: **Regional cyst concentration as a prognostic biomarker for polycystic kidney disease**, Joshua D. Warner, Maria V. Irazabal-Mira, Vicente E. Torres, Bernard F. King, Bradley J. Erickson, Mayo Clinic (USA) . . . . . [9038-3]

9:00 am: **Supervised multi-view canonical correlation analysis: fused multimodal prediction of disease prognosis**, Asha Singanamalli, Haibo Wang, Case Western Reserve Univ. (USA); George Lee, Rutgers, The State Univ. of New Jersey (USA); Natalie Shih, Amy Ziober, Mark Alan Rosen, Stephen Master, Univ. of Pennsylvania (USA); John E. Tomaszewski, Univ. at Buffalo (USA); Michael D. Feldman, Univ. of Pennsylvania (USA); Anant Madabhushi, Case Western Reserve Univ. (USA). . . . . [9038-4]

9:20 am: **Target image search using fMRI signals**, Shi Xiong, SuTao Song, Yu Zhan, Jiacai Zhang, Beijing Normal Univ. (China) . . . . . [9038-5]

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

9038 continues on page 23

Conference 9034 continued
Image Processing
Room: San Diego

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

Segmentation
Session Chairs: **Brian Nutter,** Texas Tech Univ. (USA);
Elsa D. Angelini, Télécom ParisTech (France)

10:10 am: **Multiscale feature learning on pixels and super-pixels for seminal vesicles MRI segmentation**, Qinquan Gao, Akshay Asthana, Tong Tong, Daniel Rueckert, Philip Edwards, Imperial College London (UK) . . . . . [9034-6]

10:30 am: **Failure analysis for model-based organ segmentation using outlier detection**, Axel Saalbach, Irina Waechter-Stehle, Philips Technologie GmbH (Germany); Cristian Lorenz, Philips Technologie GmbH, Innovative Technologies, Research Laboratories (Germany); Jürgen Weese, Philips Technologie GmbH (Germany) . . . . . [9034-7]

10:50 am: **Brain abnormality segmentation based on L1-norm minimization**, Ke Zeng, Guray Erus, Manoj Tanwar, Christos A. Davatzikos, Univ. of Pennsylvania (USA) . . . . . [9034-8]

11:10 am: **Towards a comprehensive CT image segmentation for thoracic organ radiation dose estimation and reporting**, Cristian Lorenz, Heike Ruppertshofen, Torbjörn Vik, Philips Research (Germany); Peter Prinsen, Jens Wiegert, Philips Research (Netherlands) . . . . . [9034-9]

11:30 am: **Neuromuscular fiber segmentation through particle filtering and discrete optimization**, Thomas Dietenbeck, Univ. de Lyon (France) and Czech Technical Univ. in Prague (Czech Republic); François Varray, Univ. de Lyon (France); Jan Kybic, Czech Technical Univ. in Prague (Czech Republic); Olivier Basset, Univ. de Lyon (France); Christian Cachard, Univ. Claude Bernard Lyon 1 (France). . . . . [9034-10]

11:50 am: **Prostate segmentation in MRI using fused T2-weighted and elastography images**, Guy Nir, Ramin S. Sahebjavaher, The Univ. of British Columbia (Canada); Ali Baghani, Ultrasonix Medical Corp. (Canada); Ralph Sinkus, King's College London (UK); Septimiu E. Salcudean, The Univ. of British Columbia (Canada). . . . . [9034-11]

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

9034 continues on page 24

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Image Perception
Session Chair: **Elizabeth A. Krupinski,** The Univ. of Arizona (USA)

10:10 am: **Adaptive controller for volumetric display of neuroimaging studies**, Ben Bleiberg, National Intrepid Ctr. of Excellence (USA); Justin Senseney, National Institutes of Health (USA); Jesus J. Caban, National Intrepid Ctr. of Excellence (USA). . . . . [9037-4]

10:30 am: **Preference and performance regarding different image sizes when reading cranial CT**, Antje C. Venjakob, Technische Univ. Berlin (Germany); Tim Marnitz, Charité Universitätsmedizin Berlin (Germany); Claudia R. Mello-Thoms, The Univ. of Sydney (Australia). . . . . [9037-5]

10:50 am: **Gaze as a biometric**, Hong-Jun Yoon, Oak Ridge National Lab. (USA); Tandy Carmichael, Tennessee Technological Univ. (USA); Georgia D. Tourassi, Oak Ridge National Lab. (USA) . . . . . [9037-6]

11:10 am: **Going on with false beliefs: What if satisfaction of search was really suppression of recognition?**, Claudia R. Mello-Thoms, Phuong Dung Trieu, Patrick C. Brennan, The Univ. of Sydney (Australia) . . . [9037-7]

11:30 am: **Pilot reader studies to compare digital microscopic images versus the microscope**, Brandon D. Gallas, Marios A. Gavrielides, U.S. Food and Drug Administration (USA) and Ctr. for Devices and Radiological Health (USA); Jason Hipp, National Cancer Institute (USA) and National Institutes of Health (USA); Adam Wunderlich, U.S. Food and Drug Administration (USA); Stephen M. Hewitt, National Cancer Institute (USA) and National Institutes of Health (USA). . . . . [9037-8]

11:50 am: **Visual quality assessment of H.264/AVC compressed laparoscopic video**, Asli E. Kumcu, Klaas Bombeke, Univ. Gent (Belgium); Heng Chen, Vrije Univ. Brussel (Belgium); Ljubomir Jovanov, Ljiljana Platisa, Hiệp Q. Luong, Jan Van Looy, Univ. Gent (Belgium); Yves Van Nieuwenhove, Univ. Ziekenhuis Gent (Belgium); Peter Schelkens, Vrije Univ. Brussel (Belgium); Wilfried Philips, Univ. Gent (Belgium) . . . . . [9037-9]

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

9037 continues on page 24

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

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

fMRI and Brain
Session Chairs: **Nicholas J. Tustison,** Univ. of Virginia (USA);
Barjor Gimi, Dartmouth Hitchcock Medical Ctr. (USA)

10:10 am: **Different brain activations between own- and other-race face categorization: an fMRI study using group independent component analysis**, Wenjuan Wei, Institute of Automation (China); Jiangang Liu, Beijing Jiaotong Univ. (China); Ruwei Dai, Lu Zi Feng, Institute of Automation (China); Ling Li, Beijing Jiaotong Univ. (China); Jie Tian, Institute of Automation (China) . . . . . [9038-6]

10:30 am: **Effects of non-neuronal components for functional connectivity analysis from resting-state functional MRI toward automated diagnosis of schizophrenia**, Junghoe Kim, Samsung Advanced Institute of Technology (Korea, Republic of) and Korea Univ. (Korea, Republic of); Jong-Hwan Lee, Korea Univ. (Korea, Republic of) . . . . . [9038-7]

10:50 am: **Abnormalities of functional connectivity in amblyopia patients' resting-state fMRI**, Jieqiong Wang, Wenjing Li, Institute of Automation (China); Ling Hu, Likun Ai, Capital Medical Univ. (China) and Beijing Tongren Hospital (China); Huiguang He, Institute of Automation (China) . . . . . [9038-8]

11:10 am: **Longitudinal MR Cortical Thinning of Individuals and Its Correlation with PET Metabolic Reduction - A Measurement Consistency and Correctness Studies**, Zhongmin S. Lin, Gopal B. Avinash, Kathryn M. McMillan, Litao Yan, GE Healthcare (USA); Satoshi Minoshima, Univ. of Washington (USA) . . . . . [9038-9]

11:30 am: **Independent component analysis of DTI data reveals white matter covariances in Alzheimer's disease**, OuYang Xin, XiaoYu Sun, Ting Guo, QiaoYue Sun, Beijing Normal Univ. (China); Kewei Chen, Banner Alzheimer's Institute (USA) and Banner Good Samaritan Medical Ctr. (USA); Li Yao, Xia Wu, Xiaojuan Guo, Beijing Normal Univ. (China). . . . . [9038-10]

11:50 am: **A brain MRI atlas of the common squirrel monkey, Saimiri sciureus**, Yurui Gao, Swetasudha Panda, Shweta P. Khare, Ann S. Choe, Iwona Stepniewska, Xia LI, Zhoahua Ding, Adam Anderson, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9038-11]

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

9038 continues on page 24

Conference 9034 continued
Image Processing
Room: San Diego

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

Temporal and Motion Analysis
Session Chairs: **Jerry L. Prince,** Johns Hopkins Univ. (USA); **Jayaram K. Udupa,** Univ. of Pennsylvania (USA)

1:20 pm: **Characterizing growth patterns in longitudinal MRI using image contrast**, Avantika Vardhan, Marcel Prastawa, Clement Vachet, Guido Gerig, The Univ. of Utah (USA) . . . . . [9034-12]

1:40 pm: **Registration of organs with sliding interfaces and changing topologies**, Floris F. Berendsen, Alexis N. T. J. Kotte, Max A. Viergever, Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . [9034-13]

2:00 pm: **Elastic registration of prostate MR images based on state estimation of dynamical systems**, Bahram Marami, Robarts Research Institute (Canada) and McMaster Univ. (Canada); Suha Ghoul, Robarts Research Institute (Canada); Shahin Sirouspour, McMaster Univ. (Canada); David W. Capson, Univ. of Victoria (Canada); Sean R. H. Davidson, John Trachtenberg, Ontario Cancer Institute (Canada); Aaron Fenster, Robarts Research Institute (Canada) and Univ. of Western Ontariou (Canada) . . . . . [9034-14]

2:20 pm: **A hybrid biomechanical model-based image registration method for sliding objects**, Lianghao Han, David J. Hawkes, Dean C. Barratt, Univ. College London (UK) . . . . . [9034-15]

2:40 pm: **Real-time tumor motion tracking using 2D/3D registration with kV-MV image pairs for image guided radiotherapy**, Hugo D. Furtado, Elisabeth Steiner, Markus Stock, Dietmar Georg, Wolfgang Birkfellner, Medizinische Univ. Wien (Austria) . [9034-16]

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

9034 continues on page 25

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Observer Performance
Session Chair: **Howard C. Gifford,** Univ. of Houston (USA)

1:20 pm: **Investigating links between emotional intelligence and observer performance by radiologists in mammography**, Sarah J. Lewis, Claudia R. Mello-Thoms, Steven Cumming, Patrick C. Brennan, The Univ. of Sydney (Australia); Kevin Keane, Univ. College Dublin (Ireland); Mark F. McEntee, The Univ. of Sydney (Australia); Stuart J. Mackay, Univ. of Liverpool (UK) . . . . . [9037-10]

1:40 pm: **How does radiology report format impact reading time, comprehension and visual scanning?**, Elizabeth A. Krupinski, The Univ. of Arizona (USA); Bruce Reiner, Eliot Siegel, University of Maryland (USA) . . . . . [9037-11]

2:00 pm: **Bone suppression technique for chest radiographs**, Zhimin Huo, Jing Zhang, Huimin Zhao, Carestream Health, Inc. (USA); Susan Hobbs, John Wandtke, Univ. of Rochester (USA); Anne-Marie Sykes, Mayo Clinic (USA); David H. Foos, Carestream Health, Inc. (USA). . . . . [9037-12]

2:20 pm: **The patterns of false positive lesions for chest radiography observer performance: insights into errors and locations**, John W. Robinson, Patrick C. Brennan, Claudia R. Mello-Thoms, Mariusz W. Pietryzk, Sarah J. Lewis, The Univ. of Sydney (Australia) . . . . . [9037-13]

2:40 pm: **Nonparametric EROC analysis for observer performance evaluation on joint detection and estimation tasks**, Adam Wunderlich, U.S. Food and Drug Administration (USA); Bart Goossens, Univ. Gent (Belgium) . . . . . [9037-14]

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

9037 continues on page 25

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

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

Optical Coherence Tomography
Session Chair: **Xavier Intes,** Rensselaer Polytechnic Institute (USA)

1:20 pm: **Incorporation of learned shape priors into a graph-theoretic approach with application to the 3D segmentation of intraretinal surfaces in SD-OCT volumes of mice**, Bhavna J. Antony, The Univ. of Iowa (USA); Qi Song, GE Global Research (USA); Michael D. Abràmoff, Eliott H. Sohn, Xiaodong Wu, The Univ. of Iowa (USA); Mona K. Garvin, Iowa City VA Healthcare System (USA) . . . . . [9038-12]

1:40 pm: **Atherosclerotic tissue typing using computational intravascular OCT**, Madhusudhana Gargesha, Ronny Y. Shalev, David Prabhu, Case Western Reserve Univ. (USA); Kentaro Tanaka, Univ. Hospitals of Cleveland (USA); Andrew M. Rollins, Case Western Reserve Univ. (USA); Marco Costa, Hiram G. Bezerra, Univ. Hospitals of Cleveland (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9038-13]

2:00 pm: **3D graph-based automated segmentation of corneal layers in anterior-segment optical coherence tomography images of mice**, Victor A. Robles, Bhavna J. Antony, Demelza R. Koehn, Michael G. Anderson, Mona K. Garvin, The Univ. of Iowa (USA) . . . . . [9038-14]

2:20 pm: **Microcystic macular edema detection in retina OCT images**, Emily K. Swingle, The Ohio State Univ. (USA); Andrew Lang, Aaron Carass, Howard S. Ying, Peter A. Calabresi, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . [9038-15]

2:40 pm: **Optic disc boundary segmentation from diffeomorphic demons registration of monocular fundus image sequences versus 3D visualization of stereo fundus image pairs for automated early stage glaucoma assessment**, Vijay Gatti, Jason E. Hill, Brian Nutter, Sunanda D. Mitra, Texas Tech Univ. (USA) . . . . . [9038-67]

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

9038 continues on page 25

Conference 9041 continued
Digital Pathology
Room: Golden West

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

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

1:20 pm: **Path, present and future** *(Keynote Presentation)*, Richard M. Levenson, Univ. of California, Davis (USA) . . . . . [9041-1]

2:20 pm: **Automatic detection of invasive ductal carcinoma in whole slide images with convolutional neural networks**, Angel Cruz Roa, Univ. Nacional de Colombia (Colombia); Ajay N. Basavanhally, Rutgers, The State Univ. of New Jersey (USA); Fabio A. González Osorio, Univ. Nacional de Colombia (Colombia); Hannah Gilmore, Univ. Hospitals of Cleveland (USA); Michael D. Feldman, Hospital of the Univ. of Pennsylvania (USA); Shridar Ganesan, Rutgers Cancer Institute of New Jersey (USA); Natalie Shih, Hospital of the Univ. of Pennsylvania (USA); John E. Tomaszewski, Univ. at Buffalo (USA); Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . [9041-2]

2:40 pm: **Zooming in: high resolution 3D reconstruction of differently stained histological whole slide images**, Johannes Lotz, Judith Berger, Fraunhofer MEVIS (Germany); Benedikt Müller, Kai Breuhahn, UniversitätsKlinikum Heidelberg (Germany); Niels Grabe, Ruprecht-Karls-Univ. Heidelberg (Germany); Stefan Heldmann, André Homeyer, Fraunhofer MEVIS (Germany); Bernd Lahrmann, Ruprecht-Karls-Univ. Heidelberg (Germany) and UniversitätsKlinikum Heidelberg (Germany); Hendrik Laue, Janine Olesch, Michael Schwier, Fraunhofer MEVIS (Germany); Oliver Sedlaczek, Arne Warth, UniversitätsKlinikum Heidelberg (Germany) . . . [9041-3]

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

9041 continues on page 25

Sunday · 16 February

Conference 9034 continued
Image Processing
Room: San Diego

SESSION 4
Room: San Diego . . . . . Sun 3:30 to 5:30 pm

Cardiac and Vascular Imaging
Session Chairs: **Boudewijn P. F. Lelieveldt,** Leiden University Medical Center (Netherlands); **Alejandro F. Frangi,** The Univ. of Sheffield (UK)

3:30 pm: **Active-atlas-based segmentation for automated epicardial fat volume quantification from non-contrast CT**, Xiaowei Ding, Univ. of California, Los Angeles (USA) and Cedars-Sinai Medical Ctr. (USA); Demetri Terzopoulos, Univ. of California, Los Angeles (USA); Mariana Diaz-Zamudio, Cedars Sinai Medical Ctr. (USA); Daniel S. Berman, Piotr J. Slomka, Damini Dey, Cedars-Sinai Medical Ctr. (USA) and Univ. of California, Los Angeles (USA). . . . . [9034-17]

3:50 pm: **Blood flow quantification using optical flow methods in a body fitted coordinate system**, Peter Maday, Richard Brosig, Technische Univ. München (Germany); Juergen Endres, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Markus Kowarschik, Siemens AG (Germany); Nassir Navab, Technische Univ. München (Germany) . . . . . [9034-18]

4:10 pm: **3D geometric analysis of the aorta in 3D MRA follow-up pediatric image data**, Stefan Wörz, Abdulsattar Alrajab, Raoul Arnold, Joachim Eichhorn, Ruprecht-Karls-Univ. Heidelberg (Germany); Hendrik von Tengg-Kobligk, Univ. Bern (Switzerland); Jens-Peter Schenk, Karl Rohr, Ruprecht-Karls-Univ. Heidelberg (Germany) . . . . . [9034-19]

4:30 pm: **Tensor-based tracking of the aorta in phase-contrast MR images**, Yoo-Jin Jeong, Anton Malsam, Karlsruher Institut für Technologie (Germany); Sebastian Ley, UniversitätsKlinikum Heidelberg (Germany); Fabian Rengier, Univ. Hospital Heidelberg (Germany) and Deutsches Krebsforschungszentrum (Germany); Rüdiger Dillmann, Roland Unterhinninghofen, Karlsruher Institut für Technologie (Germany) [9034-20]

4:50 pm: **Joint multi-object registration and segmentation of left and right cardiac ventricles in 4D cine MRI**, Jan Ehrhardt, Timo Kepp, Univ. zu Lübeck (Germany); Alexander Schmidt-Richberg, Imperial College London (UK); Heinz Handels, Univ. zu Lübeck (Germany) . . . . . [9034-21]

5:10 pm: **Nonrigid motion compensation in B-mode and contrast enhanced ultrasound image sequences of the carotid artery**, Diego D. B. Carvalho, Zeynettin Akkus, Johan G. Bosch, Stijn C. H. van den Oord, Erasmus MC (Netherlands); Wiro J. Niessen, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands); Stefan Klein, Erasmus MC (Netherlands) . . . . . [9034-22]

WORKSHOP
Methods and Application of Brain Connectivity
San Diego · Sun. 5:45 to 7:45 pm
Workshop Chair: **Martin Styner**, The Univ. of North Carolina at Chapel Hill (USA)
For details see page 14.

9034 continues on page 31

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Technology Assessment
Session Chair: **Jovan G. Brankov,** Illinois Institute of Technology (USA)

3:30 pm: **Non-Gaussian statistical properties of virtual breast phantoms**, Craig K. Abbey, Univ. of California, Santa Barbara (USA); Predrag R. Bakic, Univ. of Pennsylvania (USA); David D. Pokrajac, Delaware State Univ. (USA); Andrew D. A. Maidment, Univ. of Pennsylvania (USA); Miguel P. Eckstein, Univ. of California, Santa Barbara (USA); John M. Boone, UC Davis Medical Ctr. (USA). . . . . [9037-15]

3:50 pm: **Mammographic density descriptors of novel phantom images: effect of clustered lumpy backgrounds**, Yanpeng Li, Patrick C. Brennan, Elaine Ryan, The Univ. of Sydney (Australia) . . . . . [9037-16]

4:10 pm: **Using image simulation to test the effect of detector type on breast cancer detection**, Alistair Mackenzie, Lucy M. Warren, David R. Dance, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Dev P. Chakraborty, Univ. of Pittsburgh (USA); Julie Cooke, Jarvis Breast Screening and Diagnostic Ctr. (UK); Mark D. Halling-Brown, Padraig T. Looney, The Royal Surrey County Hospital NHS Trust (UK); Matthew G. Wallis, Cambridge Univ. Hospitals NHS Foundation Trust (UK) and NIHR Cambridge Biomedical Research Ctr. (UK); Rosalind M. Given-Wilson, St George's Healthcare NHS Trust (UK); Gavin G. Alexander, The Royal Surrey County Hospital NHS Trust (UK); Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK) . . . . . [9037-17]

4:30 pm: **Task-based optimization of image reconstruction in breast CT**, Adrian A. Sanchez, Emil Y. Sidky, Xiaochuan Pan, The Univ. of Chicago Medical Ctr. (USA). . . . . [9037-18]

4:50 pm: **Evaluation of penalty design in penalized maximum-likelihood image reconstruction for lesion detection**, Li Yang, Andrea Ferrero, Ramsey D. Badawi, Jinyi Qi, Univ. of California, Davis (USA) . . . . . [9037-19]

5:10 pm: **Observer assessment of multi-pinhole SPECT geometries for prostate cancer imaging, a simulation study**, Faraz Kalantari, Anando Sen, Howard C. Gifford, Univ. of Houston (USA) . . . . . [9037-20]

WORKSHOP
Dose, Risk and Task Performance
California · Sun. 5:45 to 7:45 pm
Workshop Chair: **Matthew A. Kupinski,** The Univ. of Arizona (USA)
For details see page 14.

9037 continues on page 31

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 4
Room: Royal Palm One . . . . . Sun 3:30 to 5:30 pm

Fluidics and Vascular
Session Chairs: **Amir A. Amini,** Univ. of Louisville (USA); **Robert C. Molthen,** Medical College of Wisconsin (USA)

3:30 pm: **Optimal 4D image construction from free-breathing MRI acquisitions**, Yubing Tong, Jayaram K. Udupa, The Univ. of Pennsylvania Health System (USA); Krzysztof C. Ciesielski, West Virginia Univ. (USA); Joseph M. McDonough, The Children's Hospital of Philadelphia (Zimbabwe) and Ctr. for Thoracic Insufficiency Syndrome (USA); Andrew Mong, Robert M. Campbell, The Children's Hospital of Philadelphia (USA) and Ctr. for Thoracic Insufficiency Syndrome (USA). . . . . [9038-17]

3:50 pm: **Time analysis of aneurysm wall shear stress for both Newtonian and Casson flows from image-based CFD models**, Marcelo A. Castro, Consejo Nacional de Investigaciones Científicas y Técnicas (Argentina); Maria C. Ahumada Olivares, Univ. Favaloro (Argentina); Christopher M. Putman, Texas Neurointerventional Surgery Associates (USA); Juan R. Cebral, George Mason Univ. (USA). . . . . [9038-68]

4:10 pm: **High resolution quantitative imaging of subcellular morphology and cell refractometry in a liquid environment via endogenous mechanism**, Kert Edward, The Univ. of the West Indies (Jamaica); Faramarz Farahi, The Univ. of North Carolina at Charlotte (USA) . . . . . [9038-19]

4:30 pm: **Effect of injection technique on temporal parametric imaging derived from digital subtraction angiography in patient specific phantoms**, Ciprian N. Ionita, Toshiba Stroke & Vascular Research Ctr. (USA); Victor L. Garcia, Univ. at Buffalo (USA); Daniel R. Bednarek, Kenneth Snyder, Adnan H. Siddiqui, Elad Levy, Stephen Rudin, Toshiba Stroke & Vascular Research Ctr. (USA) . . . . . [9038-20]

4:50 pm: **Challenges and limitations of patient-specific vascular phantom fabrication using 3D Polyjet printing**, Ciprian N. Ionita, Nicole Varble, Daniel R. Bednarek, Jianping Xiang, Kenneth Snyder, Adnan H. Siddiqui, Elad Levy, Stephen Rudin, Toshiba Stroke & Vascular Research Ctr. (USA) . . . . . [9038-21]

5:10 pm: **Non-invasive computation of aortic pressure maps: a phantom-based study of two approaches**, Michael Delles, Sebastian Schalck, Yves Chassein, Karlsruher Institut für Technologie (Germany); Tobias Müller, Deutsches Krebsforschungszentrum (Germany); Fabian Rengier, UniversitätsKlinikum Heidelberg (Germany) and Deutsches Krebsforschungszentrum (Germany); Stefanie Speidel, Karlsruhe Institute of Technology (KIT) (Germany); Hendrik von Tengg-Kobligk, UniversitätsKlinikum Heidelberg (Germany) and Inselspital Bern (Switzerland) and Deutsches Krebsforschungszentrum (Germany); Hans-Ulrich Kauczor, UniversitätsKlinikum Heidelberg (Germany); Rüdiger Dillmann, Roland Unterhinninghofen, Karlsruher Institut für Technologie (Germany). [9038-22]

9038 continues on page 31

Conference 9041 continued
Digital Pathology
Room: Golden West

PANEL DISCUSSION
Room: Golden West . . . . . Sun 3:30 to 5:30 pm

The Design and Benefits of Successful Grand Challenges
Session Chairs: **Stephen Aylward,** Kitware, Inc. (USA); **Bram van Ginneken,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

The Retrospective Image Registration Evaluation (RIRE) project began at Vanderbilt in 2001 and was one of the first, highly successful grand challenges in the field of medical image computation. It is largely responsible for the rapid growth in the use of registration metrics based on mutual information and the use of target registration error for registration accuracy evaluation. In the past decade, grand challenges have become commonplace, and their utility for accelerating the pace of research has become broadly accepted.

In this panel discussion we will explore the roles and potential of grand challenges from the perspective of funding agencies, academic institutes, and commercial companies. The panel and the audience will hypothesize on the key components of a successful grand challenge, and they will identify resources and research gaps related to conducting and evaluating grand challenges. SPIE MI attendees interested in operating, participating on, or improving grand challenges are encouraged to attend.

WORKSHOP
What do pathologists see on a slide?: Implications for Digital Pathology
Golden West · Sun. 5:45 to 7:45 pm
Workshop Chairs: **Metin Gurcan**, The Ohio State University (USA) and **Anant Madabhushi**, Case Western Reserve Univ. (USA)
For details see page 14.

9041 continues on page 31

WORKSHOP
The Evolution of Preclinical Molecular Imaging
Royal Palm One · Sun. 5:45 to 7:45 pm
Workshop Chairs: **Mohammed Farhoud,** Sofie Biosciences, Inc. (USA)
For details see page 14.

Posters for this conference will be on display Sunday and Monday. The interactive poster session with authors in attendance will be Monday evening from 5:15 to 6:45 pm. Poster awards will be announced in the conference meeting room on Tuesday morning.

Poster Authors: Please put up your poster during the Sunday morning coffee break. Posters will be available for viewing Sunday and Monday. Stand with your poster during the poster session from 5:15 to 6:45 pm on Monday, and please remove it no later than 9:00 pm. Posters remaining on the boards after the extended viewing time on Monday will be discarded.

Conference 9034 Posters
Image Processing

Computer-aided Classification of Liver Tumors in 3D Ultrasound Images with Combined Deformable Model Segmentation and Support Vector Machine, Myungeun Lee, Seoul National Univ. (Korea, Republic of); Jong Hyo Kim, Seoul National Univ. College of Medicine (Korea, Republic of); Moon Ho Park, Ye-Hoon Kim, Yeong Kyeong Seong, Baek Hwan Cho, Kyoung-Gu Woo, Samsung Advanced Institute of Technology (Korea, Republic of). . . . . .[9034-3]

Local sparse appearance model-based algorithm for automatic identification and segmentation of articulated hand bones, Fitsum Akilu Reda, Siemens Medical Solutions USA, Inc. (USA) and Vanderbilt Univ. (USA); Zhigang Peng, Siemens Medical Solutions USA, Inc. (USA); Gerardo Hermosillo, Shu Liao, Siemens Medical Solutions USA, Inc., CAD R&D (USA); Yoshihisa Shinagawa, Yiqiang Zhan, Xiang Sean Zhou, Siemens Medical Solutions USA, Inc. (USA) . . . . . .[9034-29]

Joint source based analysis of multiple brain structures in studying major depressive disorder, Mahdi Ramezani, Abtin Rasoulian, The Univ. of British Columbia (Canada); Tom Hollenstein, Kate Harkness, Ingrid S. Johnsrude, Queen's Univ. (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada)[9034-58]

A multi-view approach to multi-modal MRI cluster ensembles, Carlos A. Méndez Guerrero, Gloria Menegaz, Univ. degli Studi di Verona (Italy); Paul E. Summers, European Institute of Oncology (Italy) . . . . . .[9034-59]

Comparative study of two sparse multinomial logistic regression models in decoding visual stimuli from brain activity of fMRI, Sutao Song, Jinan Univ. (China); Gongxiang Chen, School of Education and Psychology, Jinan University (China); Yu Zhan, Jiacai Zhang, Beijing Normal Univ. (China); Li Yao, Beijing Normal Univ. (China) and Beijing Normal Univ. (China) . . . . . [9034-60]

Classification of microscopy images of Langerhans islet, Jan Svihlík, Institute of Chemical Technology (Czech Republic), Czech Technical Univ. in Prague (Czech Republic); Jan Kybic, Czech Technical Univ. in Prague (Czech Republic); David Habart, Zuzana Berková, Peter Girman, Jan Kríž, Klára Zacharovová, Institute for Clinical and Experimental Medicine (Czech Republic) . . . . . .[9034-61]

Classification of normal and pathological aging processes based on brain MRI morphology measures, Jorge L. Perez-Gonzalez, Oscar Yanez-Suarez, Veronica Medina-Banuelos, Univ. Autónoma Metropolitana (Mexico)[9034-62]

Support vector machine based IS/OS disruption detection from SD-OCT images, Liyun Wang, Weifang Zhu, Soochow Univ. (China); Jianping Liao, Guangxi Univ. (China); Dehui Xiang, Chao Jin, Soochow Univ. (China); Haoyu Chen, Joint Shantou International Eye Ctr. (China); Xinjian Chen, Soochow Univ. (China) . . . . . .[9034-63]

Breast tissue classification in digital breast tomosynthesis images based on global gradient minimization and texture features, Xulei Qin, Emory Univ. (USA); Guolan Lu, Ioannis Sechopoulos, Baowei Fei, Emory Univ. (USA) and Georgia Institute of Technology (USA). . . .[9034-64]

A minimum spanning forest based hyperspectral image classification method for cancerous tissue detection, Robert Pike, Samuel K. Pattpm, Emory Univ. (USA); Guolan Lu, Emory Univ. (USA) and Georgia Institute of Technology (USA); Luma V. Halig, Dongsheng Wang, Zhuo Georgia Chen, Emory Univ. (USA); Baowei Fei, Emory Univ. (USA) and Georgia Institute of Technology (USA). . . [9034-65]

Protein crystallization image classification with elastic net, Kazunori Okada, Jeffrey Hung, John Collins, Mehari Weldetsion, Oliver Newland, Eric Chiang, San Francisco State Univ. (USA); Steve Guerrero, Genentech Inc. (USA) .[9034-66]

Example based lesion segmentation, Snehashis Roy, Qing He, Henry M. Jackson Foundation (USA); Aaron Carass, Johns Hopkins University (USA); Amod Jog, Johns Hopkins Univ. (USA); Jennifer L Cuzzocreo, Johns Hopkins Univ. School of Medicine (USA); Daniel S Reich, National Institute of Neurological Disorders and Stroke (USA); Jerry L Prince, Johns Hopkins Univ. (USA); Dzung L. Pham, Henry M. Jackson Foundation (USA) . . . . . .[9034-67]

Classification of essential tremors (ET) disorder and healthy controls using a masking technique, Rakshatha P. Krishnamurthy, Neelam Sinha, International Institute of Information Technology, Bangalore (India); Jitender Saini, Pramod Pal, National Institute of Mental Health and Neuro Sciences (India) . . . . . .[9034-68]

Variability sensitivity of dynamic texture based recognition in clinical CT data, Roland Kwitt, Stephen Aylward, Kitware, Inc. (USA); Sharif Razzaque, InnerOptic Technology, Inc. (USA); Jeffrey Lowell, Washington Univ. School of Medicine in St. Louis (USA) . . . . . .[9034-69]

Multi-view learning based robust collimation detection in digital radiographs, Hongda Mao, Rochester Institute of Technology (USA); Zhigang Peng, Siemens Medical Solutions USA, Inc. (USA); Frank Dennerlein, Siemens AG (Germany); Yoshihisa Shinagawa, Yiqiang Zhan, Xiang Sean Zhou, Siemens Medical Solutions USA, Inc. (USA) . . . . . .[9034-70]

Adaptive temporal smoothing of sinogram data using Karhunen-Loeve (KL) transform for myocardial blood flow estimation from dose-reduced dynamic CT, Dimple Modgil, The Univ. of Chicago Medical Ctr. (USA); Adam M. Alessio, Michael D. Bindschadler, Univ. of Washington (USA); Patrick J. La Rivière, The Univ. of Chicago Medical Ctr. (USA) . . . . . .[9034-71]

Implementation of compressive sensing for preclinical cine-MRI, Elliot Tan, Princeton Univ. (USA); Ming Yang, Univ. of Missouri-Columbia (USA) and Harry S. Truman Veterans Hospital (USA); Lixin Ma, Univ. of Missouri-Columbia (USA); Yahong R. Zheng, Missouri Univ. of Science and Technology (USA) . . . . . .[9034-72]

Analytic heuristics for a fast DSC-MRI, Marco Virgulin, Marco Castellaro, Fabio Marcuzzi, Enrico Grisan, Univ. degli Studi di Padova (Italy) . . . . . .[9034-73]

Resolving complex fiber architecture by means of sparse spherical deconvolution in the presence of isotropic diffusion, Oleg V. Michailovich, Quan Zhou, Univ. of Waterloo (Canada); Yogesh Rathi, Harvard Medical School, Brigham and Women's Hospital (USA) . . . . . .[9034-74]

Adaptive multi-scale total variation minimization filter for low dose CT imaging, Alexander A. Zamyatin, Toshiba Medical Research Institute USA (USA); Gene Katsevich, Princeton Univ. (USA); Roman Krylov, Univ. of Central Florida (USA); Bibo Shi, Ohio Univ. (USA); Zhi Yang, Toshiba Medical Research Institute USA (USA). . . . . .[9034-75]

Semi-supervised clustering for amygdala parcellation based on resting state fMRI data, Hewei Cheng, Yong Fan, Institute of Automation (China) . .[9034-76]

Sparse and shrunken estimates of MRI networks in the brain and their influence on network properties, Rafael Romero-Garcia, Univ. Pablo de Olavide (Spain); Line H. Clemmensen, Technical Univ. of Denmark (Denmark) . . . . . .[9034-77]

Frequency-selective quantification of skin perfusion behavior during allergic testing using photoplethysmography imaging, Nikolai Blanik, RWTH Aachen (Germany); Claudia Blazek, Kantonsspital Aarau AG (Switzerland); Carina B. Pereira, Vladimir Blazek, Steffen Leonhardt, RWTH Aachen (Germany) . . . . . .[9034-78]

Characterizing human retinotopic mapping with conformal geometry: a preliminary study, Duyan Ta, Arizona State Univ. (USA); Brian Barton, Alyssa Brewer, Univ. of California, Irvine (USA); Zhong-Lin Lu, The Ohio State Univ. (USA); Gao Xing, Jie Shi, Yalin Wang, Arizona State Univ. (USA) . . . . . .[9034-79]

Fusion of digital breast tomosynthesis images via wavelet synthesis for improved lesion conspicuity, Harishwaran Hariharan, Victor V. Pomponiu, Univ. of Pittsburgh (USA); Bin Zheng, The Univ. of Oklahoma (USA); Bruce R. Whiting, David Gur, Univ. of Pittsburgh (USA). . . . . .[9034-80]

Combination of graph theoretic grouping and time-frequency analysis for image segmentation with an example for EDI-OCT, Rahele Kafieh, Hossein Rabbani, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of) . . . . . .[9034-81]

Smoothing fields of weighted collections with applications to diffusion MRI processing, Gunnar A. Sigurdsson, Jerry L. Prince, Johns Hopkins Univ. (USA) . . . . . .[9034-82]

Anisotropic anomalous filter as a tool for decreasing patient exam time in diffusion weighted MRI protocols, Antonio Carlos da Silva Senra Filho, Gustavo C. Barizon, Carlos Ernesto G. Salmon, Luiz O. Murta Jr., Univ. de São Paulo (Brazil). . . . . .[9034-83]

Image restoration using the total variational deconvolution in optical coherence tomography, Kuanhong Xu, Qiang Wang, Xiaotao Wang, Ping Guo, Haibing Ren, Samsung Advanced Institute of Technology (China); Jaeguyn Lim, Woo-Young Jang, Samsung Advanced Institute of Technology (Korea, Republic of). .[9034-84]

Non-local total variation method for despeckling of ultrasound images, Jianbin Feng, Mingyue Ding, Xuming Zhang, Huazhong Univ. of Science and Technology (China). . . . . .[9034-85]

Stent enhancement using a locally adaptive unsharp masking filter in digital X-ray fluoroscopy, Yuhao Jiang, Eranda Ekanayake, Univ. of Central Oklahoma (USA) . . . . . .[9034-86]

A local technique for contrast preserving medical image enhancement, Suresh R. Pant, Deepak Ghimire, Keunho Park, Joonwhoan Lee, Chonbuk National Univ. (Korea, Republic of) . . . . . .[9034-87]

Robust isotropic super-resolution by maximizing a Laplace posterior for MRI volumes, Xian-Hua Han, Yutaro Iwamoto, Ritsumeikan Univ. (Japan); Akihiko Shiino, Shiga Univ. of Medical Science (Japan); Yen-Wei Chen, Ritsumeikan Univ. (Japan). . . . . .[9034-88]

New multiscale speckle suppression and edge enhancement with nonlinear diffusion and homomorphic filtering for medical ultrasound imaging, JinBum Kang, Yangmo Yoo, Sogang Univ. (Korea, Republic of). . . . . .[9034-89]

Magnetic resonance and computed tomography fusion using improved guided filter, Amina Jameel, Abdul Ghafoor, Muhammad Mohsin Riaz, National Univ. of Sciences and Technology (Pakistan) . . . . . .[9034-90]

Evaluating the predictive power of multivariate tensor-based morphometry in Alzheimer's disease progression via convex fused sparse group Lasso, Sinchai Tsao, The Univ. of Southern California (USA); Jiayu Zhou, Jie Shi, Jieping Ye, Yalin Wang, Arizona State Univ. (USA); Natasha Lepore, The Univ. of Southern California (USA); Niharika Gajawelli, Univ of Southern California (USA) . . . . . [9034-91]

Recognizing patterns of visual field loss using unsupervised machine learning, Siamak Yousefi, Michael H. Goldbaum, Linda M. Zangwill, Univ. of California, San Diego (USA); Felipe A. Medeiros, Univ. of California at San Diego (USA); Christopher Bowd, Univ. of California, San Diego (USA) . . . . . .[9034-92]

False positive reduction of microcalcification cluster detection in digital breast tomosynthesis, Ning Xu, Univ. of Illinois at Urbana-Champaign (USA) and GE Global Research (USA); Paulo Mendonca, GE Global Research (USA); Ravi K. Samala, Heang-Ping Chan, Univ. of Michigan Health System (USA) . . . . . .[9034-93]

Unsupervised nonlinear dimensionality reduction machine learning methods applied to multiparametric MRI in cerebral ischemia: preliminary results, Vishwa S. Parekh, Jeremy R. Jacobs, Michael A. Jacobs, Johns Hopkins Univ. (USA) . . . . . .[9034-94]

On study design in neuroimaging heritability analyses, Mary E. Koran, Bo Li, Vanderbilt Univ. (USA); Neda Jahanshad, Univ. of California, Los Angeles (USA); Tricia A. Thornton-Wells, Vanderbilt Univ. (USA); David C. Glahn, Yale Univ. (USA); Paul M. Thompson, Univ. of California, Los Angeles (USA); John Blangeroe, Texas Biomedical Research Institute (USA); Thomas E. Nichols, The Univ. of Warwick (UK); Peter Kochunov, Maryland Psychiatric Research Ctr. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9034-96]

Determination of the intervertebral disc space from CT images of the lumbar spine, Robert Korez, Univ. of Ljubljana (Slovenia); Darko Štern, Graz Univ. of Technology (Austria); Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia); Tomaž Vrtovec, Univ. of Ljubljana (Slovenia). . . . . [9034-98]

Blood flow quantification using 1D CFD parameter identification, Richard Brosig, Technische Univ. München (Germany); Markus Kowarschik, Siemens AG (Germany); Peter Maday, Amin Katouzian, Stefanie Demirci, Nassir Navab, Technische Univ. München (Germany) . . . . . .[9034-99]

Arterial tree tracking from anatomical landmarks in magnetic resonance angiography scans, Alison O'Neil, Erin Beveridge, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Graeme Houston, Lynne McCormick, Univ. of Dundee (UK); Ian Poole, Toshiba Medical Visualization Systems Europe, Ltd. (UK) . . . . . .[9034-100]

Automated volumetric breast density derived by shape and appearance modeling, Serghei Malkov, Karla Kerlikowske, John A. Shepherd, Univ. of California, San Francisco (USA). [9034-101]

Multiple-model strategy improves sensitivity in automatic anatomy recognition via fuzzy models, Leticia Rittner, Univ. Estadual de Campinas (Brazil); Jayaram K. Udupa, Univ. of Pennsylvania (USA) . . . . . .[9034-102]

An artifact-robust technique for the automatic segmentation of the labyrinth in post-cochlear-implantation CT, Fitsum Akilu Reda, Jack H. Noble, Vanderbilt Univ. (USA); Robert F. Labadie, Vanderbilt Univ. Medical Ctr. (USA); Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . . .[9034-103]

Measurement of blood flow velocity in vivo video sequences with motion estimation methods, Yansong Liu, Rochester Institute of Technology (USA); Angela Glading, Univ. of Rochester (USA); Eli Saber, Maria Helguera, Rochester Institute of Technology (USA) . .[9034-104]

Interpolation of longitudinal shape and image data via optimal mass transport, Yi Gao, Liangjia Zhu, The Univ. of Alabama at Birmingham (USA); Sylvain Bouix, Harvard Medical School (USA); Allen Tannenbaum, The Univ. of Alabama at Birmingham (USA) . . . . . .[9034-105]

Respiratory motion variations from skin surface on lung cancer patients from 4D CT data, Nicolas Gallego, Jonathan Orban de Xivry, Antonin Descampe, Samuel Goossens, Univ. Catholique de Louvain (Belgium); Xavier Geets, Cliniques Univ. Saint-Luc (Belgium); Guillaume Janssens, IBA SA (Belgium); Benoît M. Macq, Univ. Catholique de Louvain (Belgium) . . . . . .[9034-106]

Motion estimation for nuclear medicine: a probabilistic approach, Rhodri L. Smith, Univ. of Surrey (UK); Ashrani Aizuddin Abdul Rahni, Univ. Kebangsaan Malaysia (Malaysia); Kevin Wells, Univ. of Surrey (UK) . . . . . .[9034-107]

Automatic lobar segmentation for diseased lungs using an anatomy-based priority knowledge in low-dose CT images, Sang Joon Park, Jung Im Kim, Seoul National Univ. Hospital (Korea, Republic of); Jin Mo Goo, Seoul National Univ. College of Medicine (Korea, Republic of); Doohee Lee, Seoul National Univ. Hospital (Korea, Republic of) . . .[9034-108]

Splitting of overlapping nuclei guided by robust combinations of concavity points, Marina Plissiti, Eleni Louka, Christophoros Nikou, Univ. of Ioannina (Greece). . . . . .[9034-109]

Brain tumor locating in 3D MR volume using symmetry, Pavel Dvorak, Institute of Scientific Instruments of the ASCR, v.v.i. (Czech Republic) and Brno Univ. of Technology (Czech Republic); Karel Bartusek, Academy of Sciences of the Czech Republic (Czech Republic). . . . . [9034-110]

CT image noise reduction using rotational-invariant feature in Stockwell transform, Jian Su, Zhoubo Li, Joshua D. Warner, Lifeng Yu, Daniel J. Blezek, Bradley J. Erickson, Mayo Clinic (USA) . . . . . [9034-111]

An automated algorithm for the identification of choriocapillaris in 2D-OCT images, Sumohana Channappayya, Indian Institute of Technology Hyderabad (India); Siva Teja Kakileti, Indian Institute of Technology Guwahati (India); Ashutosh Richhariya, Jay Chhablani, LV Prasad Eye Institute (India). . . . . [9034-112]

Robust vessel detection and segmentation in ultrasound images by a data-driven approach, Ping Guo, Qiang Wang, Xiaotao Wang, Zhihui Hao, Kuanhong Xu, Haibing Ren, Samsung Advanced Institute of Technology (China); Jung-Bae Kim, Youngkyoo Hwang, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [9034-113]

Enhancement of 3D modeling and classification of microcalcification's clusters in breast computed tomography (BCT), Hiam H. Alquran, Univ. of Massachusetts Lowell (USA); Eman Shaheen, Katholieke Univ. Leuven (Belgium); J. Michael O'Connor, Univ. of Massachusetts Medical School (USA); Mufeed M. Mahmoud, Univ. of Massachusetts Lowell (USA) . . [9034-114]

Quantitative analysis of rib movement based on dynamic chest bone images: preliminary results, Rie Tanaka, Kanazawa Univ. (Japan); Kenji Suzuki, The Univ. of Chicago (USA); Shigeru Sanada, Makoto Oda, Mitsutaka Suzuki, Kanazawa Univ. (Japan); Keita Sakuta, Kanazawa Univ. (Japan); Hiroki Kawashima, Kanazawa Univ. School of Medicine (Japan). . . . . [9034-115]

Quantifying and visualizing variations in sets of images using continuous linear optimal transport, Soheil Kolouri, Gustavo K. Rohde, Carnegie Mellon Univ. (USA) . . . . . [9034-116]

Context based algorithmic framework for identifying and classifying embedded images of follicle units, Md Mahbubur Rahman, S. S. S. Iyengar, Wei Zeng, Frank Hernandez, Florida International Univ. (USA); Bernard P. Nusbaum, Paul Rose, Hair Transplant Institute of Miami (USA) . . . . . [9034-117]

A framework for retinal layer intensity analysis for retinal artery occlusion patient based on 3D OCT, Jianping Liao, Guangxi Univ. (China); Haoyu Chen, Joint Shantou International Eye Ctr. (China); Chunlei Zhou, Ganzhou Tiantangniao Co. (China); Xinjian Chen, Soochow Univ. (China) . . . . . [9034-118]

Single 3D cell segmentation from optical CT microscope images, Yiting Xie, Anthony P. Reeves, Cornell Univ. (USA) . . . . . [9034-119]

Method for traversing and labeling complex vascular tree structures from 3D medical images: description, validation and application, Walter G. O'Dell, Univ. of Florida (USA); Sindhuja Govindarajan, Athinoula A. Martinos Ctr. for Biomedical Imaging (USA); Ankit Salgia, Johnson & Johnson (India); Satya Hegde, Sreekala Prabhakaran, Univ. of Florida (USA); Ender Finol, The Univ. of Texas at San Antonio (USA); R. James White, Univ. of Rochester Medical Ctr. (USA) [9034-120]

Standardized anatomic space for abdominal fat quantification, Yubing Tong, The Univ. of Pennsylvania Health System (USA); Jayaram K. Udupa, Univ. of Pennsylvania (USA); Drew A. Torigian, Hospital of the Univ. of Pennsylvania (USA) . . . . . [9034-121]

Registration of segmented histological images using thin plate splines and belief propagation, Jan Kybic, Czech Technical Univ. in Prague (Czech Republic) . . . . . [9034-122]

Accurate, fully-automated registration of coronary arteries for volumetric CT digital subtraction angiography, Brian Mohr, Marco Razeto, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Kazumasa Arakita, Toshiba Medical Systems Corp. (Japan); J. D. D. Schuijf, Toshiba Medical Systems Europe B.V. (Netherlands); Andreas Fuchs, Jørgen Tobias Kühl, Rigshospitalet (Denmark); Marcus Chen, National Institutes of Health (USA); K. F. F. Kofoed, Rigshospitalet (Denmark) . . . . . .[9034-123]

A multi-resolution strategy for a multi-objective deformable image registration framework that accommodates large anatomical differences, Tanja Alderliesten, Academisch Medisch Ctr. (Netherlands); Peter A. N. Bosman, Ctr. voor Wiskunde en Informatica (Netherlands); Jan-Jakob Sonke, The Netherlands Cancer Institute (Netherlands); Arjan Bel, Academisch Medisch Ctr. (Netherlands). . . . . .[9034-124]

An adaptive patient specific deformable registration for breast images of positron emission tomography and magnetic resonance imaging using finite element approach, Cheng Xue, Fuk-hay Tang, The Hong Kong Polytechnic Univ. (Hong Kong, China) . . . . . .[9034-125]

Computed tomography lung iodine contrast mapping by image registration and subtraction, Keith Goatman, Costas Plakas, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Joanne Schuijf, Toshiba Medical Systems Europe B.V. (Netherlands); Erin Beveridge, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Mathias Prokop, Radboud Univ. Nijmegen Medical Ctr. (Netherlands). . . . . .[9034-126]

A hybrid biomechanical intensity based deformable image registration for lung 4D CT, Navid Samavati, Mike Velec, Univ. of Toronto (Canada); Kristy K. Brock, Univ. of Michigan (USA) . . . . . .[9034-127]

Two-step FEM-based Liver-CT registration: improving internal and external accuracy, Cristina Oyarzun Laura, Klaus Drechsler, Stefan Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . .[9034-128]

Normal distributions transform in multi-modal image registration of optical coherence tomography and computed tomography datasets, Jesús Díaz Díaz, Mauro H. Riva, Leibniz Univ. Hannover (Germany); Omid Majdani, Medizinische Hochschule Hannover (Germany); Tobias Ortmaier, Leibniz Univ. Hannover (Germany) . . . . . .[9034-129]

Automatic registration of imaging mass spectrometry data to the Allen Brain Atlas transcriptome, Walid M. Abdelmoula, Ricardo J. Carreira, Reinald Shyti, Benjamin Balluff, Else Tolner, Arn M. J. M. van den Maagdenberg, Boudewijn P. F. Lelieveldt, Liam McDonnell, Jouke Dijkstra, Leiden Univ. Medisch Ctr. (Netherlands). . . . . [9034-130]

Wavelet based free-form deformations for nonrigid registration, Wei Sun, Erasmus MC (Netherlands); Wiro J. Niessen, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands); Stefan Klein, Erasmus MC (Netherlands) . . . . . [9034-131]

Non-rigid target tracking in 2D ultrasound images using hierarchical grid interpolation, Lucas Royer, Alexandre Krupa, INRIA Rennes (France); Marie Babel, Institut National des Sciences Appliquées de Rennes (France) [9034-132]

Spectral embedding-based registration (SERg) aligning multimodal prostate histology and MRI, Eileen Hwuang, Sudha Karthigeyan, Shannon C. Agner, Rutgers, The State Univ. of New Jersey (USA); Mirabela Rusu, Case Western Reserve Univ. (USA); Rachel E. Sparks, Rutgers, The State Univ. of New Jersey (USA); Natalie Shih, Hospital of the Univ. of Pennsylvania (USA); John E. Tomaszewski, Univ. at Buffalo (USA); Mark Alan Rosen, Hospital of the Univ. of Pennsylvania (USA); Michael D. Feldman, The Univ. of Pennsylvania Health System (USA); Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . [9034-133]

A constrained registration problem based on Ciarlet-Geymonat stored energy, Ratiba Derfoul, Institut National des Sciences Appliquées de Rouen (France) and IFP Energies Nouvelles (France); Carole Le Guyader, Institut National des Sciences Appliquées de Rouen (France) . . . . . [9034-134]

Automatic 3D segmentation of spinal cord MRI using propagated deformable models, Benjamin De Leener, Julien Cohen-Adad, Samuel Kadoury, Ecole Polytechnique de Montréal (Canada) . . . . . [9034-135]

Interactive approach to segment organs at risk in radiotherapy treatment planning, Jose Dolz, Hortense A Kirisli, Romain Viard, Laurent Massoptier, AQUILAB (France) . . . . . [9034-136]

Auxiliary anatomical labels for joint segmentation and atlas registration, Tobias Gass, Gábor Székely, Orcun Goksel, ETH Zurich (Switzerland) . . . . . [9034-137]

Improving accuracy in coronary lumen segmentation via explicit calcium exclusion, learning-based ray detection and surface optimization, Felix Lugauer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and Siemens Corp., Corporate Technology (Germany); Jingdan Zhang, Yefeng Zheng, Siemens Corp., Corporate Technology (USA); Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Kelm, Siemens Corp., Corporate Technology (Germany) . . . . . [9034-138]

Surface-based reconstruction and diffusion MRI in the assessment of gray and white matter damage in multiple sclerosis, Matteo Caffini, Politecnico di Milano (Italy); Niels Bergsland, Politecnico di Milano (Italy) and Fondazione Don Carlo Gnocchi (Italy); Marcella Lagana, Eleonora Tavazzi, Paola Tortorella, Marco Rovaris, Fondazione Don Carlo Gnocchi (Italy); Giuseppe Baselli, Politecnico di Milano (Italy) . . . . . [9034-139]

Uterus segmentation in dynamic MRI using LBP texture descriptors, Rafael Namias, CIFASIS (Argentina); Marc-Emmanuel Bellemare, Mehdi Rahim, Lab. des Sciences de l'Information et des Systèmes (France); Nicolas Pirró, Hôpital de la Timone (France) . . . . . [9034-140]

Robust automated lymph node segmentation with random forests, David I. Allen, The Univ. of Texas at Dallas (USA) and National Institutes of Health (USA); Le Lu, Jiamin Liu, Jianhua Yao, Evrim Turkbey, Ronald M. Summers, National Institutes of Health (USA). . . . . [9034-142]

Joint image segmentation and feature parameter estimation using expectation maximization: application to transrectal ultrasound prostate imaging, Mahdi Orooji, Rachel E. Sparks, Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . [9034-143]

Combining watershed and graph cuts methods to segment organs at risk in radiotherapy, Jose Dolz, Hortense A Kirisli, Romain Viard, Laurent Massoptier, AQUILAB (France) . . . . . [9034-144]

Interactive segmentation of tongue contours in ultrasound video sequences using quality maps, Sarah Ghrenassia, École de technologie supérieure (Canada); Lucie Ménard, Univ. du Québec à Montréal (Canada); Catherine Laporte, Ecole de Technologie Supérieure (Canada) . . . . . [9034-145]

Automatic FDG-PET-based tumor and metastatic lymph node segmentation in cervical cancer, Didac Rodriges, Henrik G. Jensen, Univ. of Copenhagen (Denmark); Annika L. Jacobsen, Per Munck af Rosenschöld, Rigshospitalet (Denmark); Anders E. Hansen, Christian Igel, Sune Darkner, Univ. of Copenhagen (Denmark) . . . . . [9034-146]

MRI brain tumor segmentation and necrosis detection using adaptive Sobolev snakes, Arie Nakhmani, The Univ. of Alabama at Birmingham (USA); Ron Kikinis, Brigham and Women's Hospital (USA); Allen Tannenbaum, The Univ. of Alabama at Birmingham (USA). . [9034-147]

Real-time 3D medical structure segmentation using fast evolving active contours, Xiaotao Wang, Qiang Wang, Zhihui Hao, Kuanhong Xu, Ping Guo, Haibing Ren, Samsung Advanced Institute of Technology (China); Woo-Young Jang, Jung-Bae Kim, Samsung Advanced Institute of Technology (Korea, Republic of). . . . . [9034-148]

Finding seed points for organ segmentation using example annotations, Ranveer R. Joyseeree, ETH Zurich (Switzerland) and Univ. of Applied Sciences Western Switzerland (Switzerland); Henning Müller, Univ. of Applied Sciences Western Switzerland (Switzerland) and Univ. of Geneva (Switzerland) . . . . . [9034-149]

Atherosclerotic carotid lumen segmentation in combined B-mode and contrast enhanced ultrasound images, Zeynettin Akkus, Diego D. B. Carvalho, Stefan Klein, Stijn C. H. van den Oord, Arend F. L. Schinkel, Nico de Jong, Antonius F. W. van der Steen, Johan G. Bosch, Erasmus MC (Netherlands). . . . . [9034-150]

Shape-constrained multi-atlas segmentation of spleen in CT, Zhoubing Xu, Bo Li, Swetasudha Panda, Andrew J. Asman, Kristen L. Merkle, Peter L. Shanahan, Richard G. Abramson, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . [9034-151]

Multi-atlas segmentation with particle-based image registration, Joohwi Lee, The Univ. of North Carolina at Chapel Hill (USA); Ilwoo Lyu, The Univ. of North Carolina at Charlotte (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9034-152]

Development of automated extraction method of biliary tract from abdominal CT volumes based on local intensity structure analysis, Kusuto Koga, Yuichiro Hayashi, Tomoaki Hirose, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Tsuyoshi Igami, Masato Nagino, Kensaku Mori, Nagoya Univ. (Japan) . . . . [9034-153]

Automatic detection of mitochondria from electron microscope tomography images: a curve fitting approach, Serdar S. Tasel, Reza Z. Hassanpour, Çankaya Univ. (Turkey); Erkan U. Mumcuoglu, Middle East Technical Univ. (Turkey); Guy Perkins, Maryann E. Martone, Univ. of California, San Diego (USA) . . . . [9034-154]

Automatic segmentation of vertebral arteries in CT angiography using combined circular and cylindrical model fitting, Min Jin Lee, Helen Hong, Seoul Women's Univ. (Korea, Republic of); Jin Wook Chung, Seoul National Univ. Hospital (Korea, Republic of) . . . . . [9034-155]

Three dimensional level set based semiautomatic segmentation of atherosclerotic carotid artery wall volume using 3D ultrasound imaging, Md Murad Hossain, Khalid Aimuhanna, George Mason Univ. (USA); Limin Zhao, Brajesh Lal, Univ. of Maryland Medical Ctr. (USA); Siddhartha Sikdar, George Mason Univ. (USA) . . . . . [9034-156]

Bladder segmentation in MR images with watershed segmentation and graph cut algorithm, Thomas Blaffert, Steffen Renisch, Nicole Schadewaldt, Heinrich Schulz, Philips Research (Germany) . . . . . [9034-157]

Neurosphere segmentation in brightfield images, Jierong Cheng, Wei Xiong, Shue Ching Chia, Joo Hwee Lim, Institute for Infocomm Research (Singapore); Shvetha Sankaran, Sohail Ahmed, A*STAR Institute of Medical Biology (Singapore) . . . . . [9034-159]

3D pre- versus post-season comparisons of surface and relative pose of the corpus callosum in contact sport athletes, Yi Lao, Children's Hospital Los Angeles (USA) and The Univ. of Southern California (USA); Niharika Gajawelli, The Univ. of Southern California (USA) and Children's Hospital Los Angeles (USA); Lauren Hass, Bryce Wilkins, Darryl Hwa Hwang, Sinchai Tsao, The Univ. of Southern California (USA); Yalin Wang, Arizona State Univ. (USA); Meng Law, The Univ. of Southern California (USA); Natasha Lepore, The Univ. of Southern California (USA) and Children's Hospital Los Angeles (USA) and The Univ. of Southern California (USA) . . . . . [9034-160]

A versatile tomographic forward- and back-projection approach on Multi-GPUs, Andreas Fehringer, Technische Univ. München (Germany); Tobias Lasser, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); Irene Zanette, Peter B. Noël, Franz Pfeiffer, Technische Univ. München (Germany) . . . . . [9034-161]

Genomic connectivity networks based on the BrainSpan atlas of the developing human brain, Ahmed Mahfouz, Technische Univ. Delft (Netherlands) and Leids Univ. Medisch Ctr. (Netherlands); Mark N. Ziats, National Institute of Child Health and Human Development (USA) and Univ. of Cambridge (UK) and Baylor College of Medicine (USA); Owen Rennert, National Institute of Child Health and Human Development (USA); Boudewijn P. F. Lelieveldt, Leids Univ. Medisch Ctr. (Netherlands) and Technische Univ. Delft (Netherlands); Marcel J. T. Reinders, Technische Univ. Delft (Netherlands) . . . . . [9034-162]

Wavelets based algorithm for the evaluation of enhanced liver areas, Matheus Alvarez, UNESP (Brazil); Diana R. Pina, UNESP (Brazil); Fernando Romeiro, UNESP (Brazil); Sérgio B. Duarte, Centro Brasileiro de Pesquisas Físicas (Brazil); José Ricardo A. Miranda, Guilherme Giacomini, Seizo Yamashita, UNESP (Brazil) . . . . . [9034-163]

3D segmentation of masses in DCE-MRI images using FCM and adaptive MRF, Chengjie Zhang, Li Hua Li, Hangzhou Dianzi Univ. (China). . . . . [9034-164]

Conference 9037 Posters

Image Perception, Observer Performance, and Technology Assessment

A comparison of Australian and USA radiologists' performance in detection of breast cancer, Wasfi I. Suleiman, The Univ. of Sydney (Australia); Dianne Georgian-Smith, Brigham and Women's Hospital, Harvard Medical School. (USA); Michael G Evanoff, The American Board of Radiology (USA); Sarah Lewis, The Univ. of Sydney (Australia) and The Brain and Mind Research Institute (Australia); Mark F. McEntee, The Univ. of Sydney (Australia) . . . . . [9037-39]

Investigations of internal noise levels for different target sizes, contrasts, and noise structures, Minah Han, Shinkook Choi, Jongduk Baek, Yonsei Univ. (Korea, Republic of) . . . . . [9037-40]

Investigating the visual inspection subjectivity on the contrast-detail evaluation in digital mammography images, Maria A. Sousa, Univ. de São Paulo (Brazil); Regina B. Medeiros, Univ. Federal de São Paulo (Brazil); Homero Schiabel, Univ. de São Paulo (Brazil) . . . . . [9037-41]

The quest for 'diagnostically lossless' medical image compression: a comparative study of objective quality metrics for compressed medical images, Ilona A. Kowalik-Urbaniak, Dominique Brunet, Jiheng Wang, Univ. of Waterloo (Canada); David Koff, Nadine Smolarski-Koff, McMaster Univ. (Canada); Edward R. Vrscay, Univ. of Waterloo (Canada); Bill Wallace, Agfa HealthCare (Canada); Zhou Wang, Univ. of Waterloo (Canada) . . . . . [9037-42]

A comparison of ROC inferred from FROC and conventional ROC, Mark F. McEntee, Mariusz W. Pietrzyk, Stephen Littlefair, The Univ. of Sydney (Australia) and Brain & Mind Research Institute (Australia) . . . . . [9037-43]

Visual search behavior during laparoscopic cadaveric procedures, Yan Chen, Leng Dong, Alastair G. Gale, Loughborough Univ. (UK); Benjamin Rees, Charles Maxwell-Armstrong, Queen's Medical Ctr. (UK) . . . . . [9037-44]

Direction of an initial saccade during perception of chest radiographs, Mariusz W. Pietrzyk, The Univ. of Sydney (Australia); Mark F. McEntee, The Univ. of Sydney (Australia) and Brain & Mind Research Institute (Australia); Michael E. Evanoff, The American Board of Radiology (USA); Patrick C. Brennan, The Univ. of Sydney (Australia); Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) and Univ. of Pittsburgh (USA) . . . . . [9037-45]

Complementary cumulative precision distribution: a new graphical metric for medical image retrieval system, Jatindra K. Dash, Sudipta Mukhopadhyay, Indian Institute of Technology Kharagpur (India). . . . . [9037-46]

Preliminary experiments on quantification of skin condition, Kenzo Kitajima, Hitoshi Iyatomi, Hosei Univ. (Japan). . . . . [9037-47]

Validation and comparison of intensity based methods for change detection in serial brain images, Žiga Lesjak, Žiga Špiclin, Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia) . . . . . [9037-48]

Validation of parameter estimation methods for determining optical properties of atherosclerotic tissues in intravascular OCT, Ronny Y. Shalev, Madhusudhana Gargesha, David Prabhu, Kentaro Tanaka, Andrew M. Rollins, Marco Costa, Case Western Reserve Univ. (USA); Hiram G. Bezerra, Univ. Hospitals of Cleveland (USA); Guy Lamouche, National Research Council Canada (Canada); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9037-49]

Automated stent strut coverage analysis in intravascular OCT images using support vector machine, Hong Lu, Case Western Reserve Univ. (USA); Kentaro Tanaka, Hiram G. Bezerra, Univ. Hospitals Case Medical Ctr. (USA) and Cardiovascular Imaging Core Lab. (USA); Andrew M. Rollins, David L. Wilson, Case Western Reserve Univ. (USA). . . . . [9037-50]

Analysis of temporal dynamics in imagery during acute limb ischemia and reperfusion, John M. Irvine, John Regan, Tammy A. Spain, Draper Lab. (USA); Joseph D. Caruso, Maricela Rodriquez, Rajiv Luthra, Jonathan Forsberg, Nicole J. Crane, Eric Elster, Naval Medical Research Ctr. (USA) . . . . . [9037-51]

Visual perception based x-ray fluoroscopy image enhancement, Santosh Singh, The Shiv Nadar Univ. (India); Ankur Gupta, Samsung Research India (India) . . . . . [9037-52]

Clinical compliance of viewing conditions in radiology reporting environments against current guidelines and standards, Shona Daly, Louise A. Rainford, Marie Louise Butler, Univ. College Dublin (Ireland). . . . [9037-53]

Study of quality perception in medical images based on comparison of contrast enhancement techniques in mammographic images, Bruno R. Matheus, Luciana B. Verçosa, Bruno Barufaldi, Homero Schiabel, Univ. de São Paulo (Brazil). . . . . [9037-54]

CT radiation dose optimization: successful implementation for routine head, chest and abdominal CT examination, Lama Sakhnini, Univ. of Bahrain (Bahrain); Majed Dwaik, King Hamad Univ. Hospital (Bahrain); Jehad Tammous, King Hamad Univ. Hopsital (Bahrain); Rami Alawad, King Hamad Univ. Hospital (Bahrain) . . . . . [9037-55]

MedXViewer: an extensible web-enabled software package for medical imaging, Padraig T. Looney, The Royal Surrey County Hospital NHS Trust (UK); Alistair Mackenzie, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) and Univ. of Surrey (UK); Mark D. Halling-Brown, The Royal Surrey County Hospital NHS Trust (UK). . . . . [9037-56]

Atlas-registration based image segmentation of MRI human thigh muscles in 3D space, Ezak Ahmad, Moi Hoon Yap, Jamie S. McPhee, Hans Degens, Manchester Metropolitan Univ. (UK) . . . . . [9037-57]

Automatic segmentation of abdominal vessels for improved pancreas localization, Amal Farag, Jiamin Liu, Ronald M. Summers, National Institutes of Health (USA) and Imaging Biomarkers and CAD Lab. (USA) . . . . . [9037-58]

Ensuring consistent color display in medical images: in terms of color calibration, brightness of monitor and ambient light, Daiki Iwai, Nagoya Univ. Graduate School of Medicine (Japan); Minoru Hosoba, Kazuko Ohno, Yutaka Emoto, Yoshito Tabata, Kyoto College of Medical Science (Japan); Norihisa Matsui, Shimadzu Corp. (Japan). . . . . [9037-59]

Laterally extended field of view without geometric distortion using image stitching in open-configuration MRI, Cheol Pyo Hong, Dong-Hoon Lee, Korea Research Institute of Standards and Science (Korea, Republic of); Bong Soo Han, Yonsei Univ. (Korea, Republic of). . . . . [9037-60]

A new iterative method for liver segmentation from perfusion CT scans, Ahmed Draoua, Univ. d'Auvergne Clermont-Ferrand I (France); Adélaïde Albouy-Kissi, Antoine Vacavant, Univ. d'Auvergne Clermont-Ferrand I (France). . . . . [9037-61]

Evaluation of correlation between CT image features and ERCC1 ptotein expression in assessing lung cancer prognosis, Maxine Tan, Nastaran Emaminejad, The Univ. of Oklahoma (USA); Wei Qian, The Univ. of Texas at El Paso (USA); Yan Kang, Northeast University (China); Yubao Guan, Guangzhou Medical University (China); Fleming Yuan Ming Lure, The Univ. of Texas at El Paso (USA); Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9037-62]

Comparison of two indirect detection flat panel imagers, Kent M. Ogden, Kimball Clark, Andrij R. Wojtowycz, Michele Lisi, Ernest M. Scalzetti, SUNY Upstate Medical Univ. (USA) . . . . . [9037-63]

Conference 9038
Biomedical Applications in Molecular, Structural, and Functional Imaging

A statistical model for 3D segmentation of retinal choroid in optical coherence tomography images, Hossein Rabbani, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of) . . . . . [9038-16]

Model-based motion correction of reduced field of view diffusion MRI data, Jan Hering, Deutsches Krebsforschungszentrum (Germany) and Hochschule Mannheim (Germany); Ivo Wolf, Hochschule Mannheim (Germany) and Deutsches Krebsforschungszentrum (Germany); Hans-Peter Meinzer, Klaus H. Maier-Hein, Deutsches Krebsforschungszentrum (Germany). . . . . [9038-55]

A fully automatic unsupervised segmentation framework for the brain tissues in MR images, Qaiser Mahmood, Chalmers Univ. of Technology (Sweden); Artur Chodorowski, Chalmers Univ. of Technology (Sweden) and Sahlgrenska Univ. Hopsital (Sweden); Babak Ehteshami Bejnordi, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Mikael Persson, Chalmers Univ. of Technology (Sweden) . . . . [9038-56]

Seizures localization using 3D object detection algorithm, Abhinav Bhargava, Jianming Liang, Robert A. Greenes, Arizona State Univ. (USA); David Adelson, Remy Wahnoun, Phoenix Children's Hospital (USA) . . . . . [9038-57]

Is there more valuable information in PWI datasets for a voxel-wise acute ischemic stroke tissue outcome prediction than what is represented by typical perfusion maps?, Nils Daniel Forkert, Susanne Siemonsen, Michael Dalski, Tobias Verleger, Andre Kemmling, Jens Fiehler, Univ. Medical Ctr. Hamburg-Eppendorf (Germany). . . . . [9038-58]

Cortical thinning in cognitively normal elderly cohort of 60 to 89 year old from AIBL database and vulnerable brain areas, Zhongmin S. Lin, Gopal B. Avinash, Kathryn M. McMillan, Litao Yan, GE Healthcare (USA) . . . . . [9038-59]

Characterizing the spatial distribution of microhemorrhages resulting from traumatic brain injury (TBI), Ningzhi Li, Yiyu Chou, Navid Shiee, Leighton Chan, Dzung L. Pham, John A. Butman, National Institutes of Health (USA). . . . . [9038-60]

Pair-wise Clustering of Large Scale Granger Causality Index Matrices for Revealing Communities, Axel Wismüller, Mahesh B Nagarajan, Univ. of Rochester Medical Ctr. (USA); Herbert Witte, Britta Pester, Lutz Leistritz, Friedrich-Schiller-Univ. Jena (Germany) . . . . . [9038-61]

Automated segmentation of corticospinal tract in diffusion tensor images via multi-modality multi-atlas fusion, Xiaoying Tang, Susumu Mori, Michael I. Miller, Johns Hopkins Univ. (USA) . . . . . [9038-62]

Metastatic brain cancer: prediction of response to whole-brain helical tomotherapy with simultaneous intralesional boost for metastatic disease using quantitative MR imaging features, Harish A. Sharma, Univ. of Western Ontario (Canada); Glenn S. Bauman, George Rodrigues, The Univ. of Western Ontario (Canada); Robert Bartha, Robarts Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada) . . . . . [9038-63]

Novel T lymphocyte proliferation assay using whole mouse cryo imaging, Patiwet Wuttisarnwattana, Case Western Reserve Univ. (USA); Syed A. Raza, COMSATS Institute of Information Technology (Pakistan); Saada Eid, Case Western Reserve Univ. (USA); Kenneth R. Cooke, Johns Hopkins Univ. (USA); David L. Wilson, Case Western Reserve Univ. (USA) and Univ. Hospitals of Cleveland (USA) and BioInVision (USA) . . . . . [9038-64]

Comparison analysis of the deterioration in the rat's articular cartilage inducing osteoarthritis CP-FD OCT images with histological images, Sang Hun Park, B. Y. Kim, M. Y. Lee, S. Y. Lee, S. H. Shin, Chonbuk National Univ. (Korea, Republic of); Jeong Hwan Seo, Chonbuk National Univ. Hospital (Korea, Republic of); K. Y Jang, Chonbuk National University Hospital, Dept. of Pathology (Korea, Republic of); W. C. Ham, D. H. Shin, Chonbuk National Univ (Korea, Republic of); Chul-Gyu Song, Chonbuk National Univ. (Korea, Republic of); Jin W kang, Johns Hopkins University (USA) [9038-65]

Comparison of macular OCTs in right and left eyes of normal people, Hossein Rabbani, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of). . . . . [9038-66]

Towards a myocardial contraction force reconstruction technique for heart disease assessment and therapy planning, Seyyed Mohammad Hassan Haddad, The Univ. of Western Ontario (Canada); Abbas Samani, Univ. of Western Ontario (Canada). . . . . [9038-69]

Setting ventilation parameters guided by electrical impedance tomography in an animal trial of acute respiratory distress syndrome, Michael Czaplik, Univ. Hospital Aachen (Germany) and RWTH Aachen (Germany); Ingeborg Biener, Univ. Hospital Aachen (Germany); Steffen Leonhardt, RWTH Aachen (Germany); Rolf Rossaint, Univ. Hospital Aachen (Germany) . . . . . [9038-71]

Accurate 3D kinematic measurement of temporomandibular joint using X-ray fluoroscopic images, Takaharu Yamazaki, Akiko Matsumoto, Kazuomi Sugamoto, Ken Matsumoto, Naoya Kakimoto, Yoshiaki Yura, Osaka Univ. Graduate School of Medicine, FOM (Japan) . . . . . [9038-72]

Using Anisotropic 3D Minkowski Functionals for Trabecular Bone Characterization and Biomechanical Strength Prediction in Proximal Femur Specimens , Mahesh B. Nagarajan, Titas De, Univ. of Rochester Medical Ctr. (USA); Eva Lochmüeller, Felix Eckstein, Paracelsus Medizinische Privatuniversität (Austria); Axel Wismüller, Univ. of Rochester Medical Ctr. (USA) . . . [9038-73]

The hydration behavior of hydrophilic material in biological samples using ratio of 3-to-2 photon annihilation, Hanan Aldousari, Univ. of Surrey (UK) . . . . . [9038-74]

Investigating the use of texture features for analysis of breast lesions on contrast-enhanced cone beam CT, Xixi Wang, Mahesh B. Nagarajan, Univ. of Rochester Medical Ctr. (USA); David Conover, Ruola Ning, Koning Corp. (USA); Avice O'Connell, Axel Wismüller, Univ. of Rochester Medical Ctr. (USA) . . . [9038-75]

A registration-based segmentation method with application to adiposity analysis of mice microCT images, Bing Bai, Anand Joshi, Sebastian Brandhorst, Valter D. Longo, Peter S. Conti, Richard M. Leahy, The Univ. of Southern California (USA) . . . . . [9038-76]

Relationship of ultrasound signal Intensity with sonovue concentration at body temperature in vitro, Xin Yang, Jing Li, Huazhong Univ. of Science and Technology (China); Xiaoling He, China University of Geosciences (China); kaizhi wu, Yun Yuan, Mingyue Ding, Huazhong Univ. of Science and Technology (China) . . . . . [9038-77]

A random walk based method for segmentation of intravascular ultrasound images, Jiayong Yan, Hong Liu, Shanghai Medical Instrument Institute (China); Yaoyao Cuicui, Suzhou Institute of Biomedical Engineering and Technology (China) . . . . . [9038-78]

Conference 9041 Posters
Digital Pathology

Session Chairs; **Nasir M. Rajpoot,** Univ. of Warwick (UK), Univ. of Qatar (Qatar); **Marios A. Gavrielides,** U.S. Food and Drug Administration (USA)

Prostate malignancy grading using gland-related shape descriptors, Ulf-Dietrich Braumann, Patrick Scheibe, Markus Löffler, Univ. Leipzig (Germany); Glen Kristiansen, Nicolas Wernert, Univ. Bonn (Germany) . . . . . [9041-21]

Multiparametric MR imaging of prostate cancer foci: assessing the detectability and localizability of Gleason 7 peripheral zone cancers based on image contrasts, Eli D. Gibson, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Mena Gaed, Robarts Research Institute (Canada) and Lawson Health Research Institute (Canada) and The Univ. of Western Ontario (Canada); Thomas Hrinivich, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); José A. Gomez-Lemus, Madeleine Moussa, Cesare Romagnoli, The Univ. of Western Ontario (Canada); Jonathan Mandel, St. Joseph's Hospital (Canada) and The Univ. of Western Ontario (Canada); Matthew Bastian-Jordan, St. Joseph's Hospital (Canada); Derek W. Cool, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); Suha Ghoul, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada); Stephen E. Pautler, Lawson Health Research Institute (Canada) and The Univ. of Western Ontario (Canada); Joseph L. Chin, The Univ. of Western Ontario (Canada); Cathie Crukley, Robarts Research Institute (Canada) and Lawson Health Research Institute (Canada); Glenn S. Bauman, The Univ. of Western Ontario (Canada); Aaron Fenster, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada) . . . . . [9041-22]

A generalized framework for stain separation in digital pathology applications, Biswajoy Ghosh, Sailesh Conjeti, Sri Phani K. Karri, Debdoot Sheet, Indian Institute of Technology Kharagpur (India); Hrushikesh T. Garud, Indian Institute of Technology Kharagpur (India) and Texas Instruments (India) Pvt. Ltd. (India); Arindam Ghosh, Sub-Divisional Hospital (India); Jyotirmoy Chatterjee, Ajoy K. Ray, Indian Institute of Technology Kharagpur (India) . . . . . [9041-23]

Selection of the best features for leukocytes classification in blood smear microscopic images, Omid Sarrafzadeh, Hossein Rabbani, Ardeshir Talebi, Hossein Usefi Banaem, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of) [9041-24]

A discriminant multi-scale histopathology descriptor using dictionary learning, David E. Romo, Juan D. García-Arteaga, Univ. Nacional de Colombia (Colombia); Pablo Arbeláez, Univ. of California, Berkeley (USA); Eduardo Romero Castro, Univ. Nacional de Colombia (Colombia) . . . . . [9041-25]

A multiview boosting approach to tissue segmentation, Jin Tae Kwak, Sheng Xu, Peter A. Pinto, Baris Turkbey, Marcelino Bernardo, Peter L Choyke, Bradford J. Wood, National Institutes of Health (USA) . . . . . [9041-26]

Cell density in prostate histopathology images as a measure of tumor distribution, Hayley M. Reynolds, Scott Williams, Peter MacCallum Cancer Ctr. (Australia); Alan M. Zhang, Cheng Soon Ong, David J. Rawlinson, Rajib Chakravorty, National ICT Australia (Australia) and The Univ. of Melbourne (Australia); Catherine Mitchell, Peter MacCallum Cancer Ctr. (Australia); Annette Haworth, Peter MacCallum Cancer Ctr. (Australia) and The Univ. of Melbourne (Australia) . . . . . [9041-27]

Type II fuzzy systems for amyloid plaque segmentation in transgenic mouse brains for Alzheimer's disease quantification, April Khademi, PathCore Inc. (Canada) and Univ. of Guelph (Canada); Danoush Hosseinzadeh, PathCore Inc. (Canada) . . . . . [9041-28]

Novel 3D cryo-histology method for validation of 3D imaging modalities, David Prabhu, Mohammed Q. Quatish, Case Western Reserve Univ. (USA); Emile Mehanna, Univ. Hospitals of Cleveland (USA); Zhuxian Zhou, Madhusudhana Gargesha, Andrew M. Rollins, Case Western Reserve Univ. (USA); Marco Costa, Hiram G. Bezerra, Univ. Hospitals of Cleveland (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . [9041-29]

Perceptual uniformity of commonly used color spaces, Ali N. Avanaki, Kathryn S. Espig, Barco, Inc. (USA); Tom R. Kimpe, Barco N.V. (Belgium); Albert Xthona, Barco, Inc. (USA); Cedric Marchessoux, Johan Rostang, Bastian Piepers, Barco N.V. (Belgium) . . . [9041-30]

Feature-enhancing zoom to facilitate Ki-67 hot spot detection, Jesper Molin, Chalmers Univ. of Technology (Sweden) and Linköping Univ. (Sweden) and Sectra Imtec AB (Sweden); Kavitha Shaga Devan, Karin Wårdell, Linköping Univ. (Sweden); Claes Lundström, Linköping Univ. (Sweden) and Sectra Imtec AB (Sweden) . . [9041-31]

Phenotyping TILs in situ: automated enumeration of FOXP3+ and CD69+ T cells in follicular lymphoma, James R. Mansfield, PerkinElmer, Inc. (USA)[9041-32]

Requirements, desired characteristics and architectural proposal for a visualization framework for digital pathology, Tom R. Kimpe, Barco N.V. (Belgium); Kathryn S. Espig, Ali N. Avanaki, Barco, Inc. (USA); Johan Rostang, Cedric Marchessoux, Bastian Piepers, Barco N.V. (Belgium); Albert Xthona, Barco, Inc. (USA) . . . . . [9041-33]

Novel computer-aided diagnosis of Mesothelioma using nuclear structure of mesothelial cells in effusion cytology specimens, Akif Burak Tosun, Carnegie Mellon Univ. (USA); Alex Yergiyev, Allegheny General Hospital (USA); Soheil Kolouri, Carnegie Mellon Univ. (USA); Jan F. Silverman, Allegheny General Hospital (USA); Gustavo K. Rohde, Carnegie Mellon Univ. (USA) . . . . . [9041-34]

A Bayesian framework for cell-level protein network analysis for multivariate proteomics image data, Violet N. Kovacheva, The Univ. of Warwick (UK); Nasir M. Rajpoot, The Univ. of Warwick (UK) and Univ. of Qatar (Qatar); Korsuk Sirinukunwattana, The Univ. of Warwick (UK) . . . . . [9041-36]

Automatic scale-independent morphology-based quantification of liver fibrosis, Jérémy Coatelen, HISTALIM (France) and Univ. d'Auvergne (France) and Image Science for Interventional Techniques (France); Adélaïde Albouy-Kissi, Benjamin Albouy-Kissi, Image Science for Interventional Techniques (France) and Univ. d'Auvergne (France); Jean-Philippe Coton, Laurence Sifre, HISTALIM (France); Pierre Dechelotte, Univ. Hospital Estaing (France); Armand Abergel, Univ. Hospital Estaing (France) and Image Science for Interventional Techniques (France) and Univ. d'Auvergne (France) . . . . . [9041-37]

Color accuracy and reproducibility in whole slide imaging scanners using phantom slides, Prarthana Shrestha, Bas Hulsken, Philips Digital Pathology Solutions (Netherlands). . . . . [9041-38]

Tuesday/Wednesday Posters page 39.

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

Keynote and Cardiac CT

Session Chairs: **Bruce R. Whiting,** Univ. of Pittsburgh (USA); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany)

8:00 am: **Noninvasive functional assessment of coronary artery disease using cardiac CT imaging and computational fluid dynamics** *(Keynote Presentation)*, Charles A. Taylor, HeartFlow, Inc. (USA) and Stanford Univ. (USA) . . . . . [9033-1]

9:00 am: **Simulation evaluation of quantitative myocardial perfusion assessment from dynamic cardiac CT**, 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) . . . . . .[9033-2]

9:20 am: **A combined local and global motion estimation and compensation method for cardiac CT**, Qiulin Tang, Beshan S. Chiang, Toshiba Medical Research Institute USA (USA); Akin Akinyemi, Toshiba Medical Visualization Systems Europe, Ltd. (UK); Alexander A. Zamyatin, Toshiba Medical Research Institute USA (USA); Bibo Shi, Ohio Univ. (USA); Satoru Nakanishi, Toshiba Medical Research Institute USA (USA) . . . .[9033-3]

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

9033 continues on page 32

Conference 9034 continued
Image Processing
Room: San Diego

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

DTI

Session Chairs: **Sonia Pujol,** Brigham and Women's Hospital (USA); **James C. Gee,** Univ. of Pennsylvania (USA)

8:00 am: **Influence of image registration on ADC images computed from free-breathing diffusion MRIs of the abdomen**, Jean-Marie Guyader, Erasmus MC (Netherlands); Livia Bernardin, Naomi H. M. Douglas, The Institute of Cancer Research (UK) and Royal Marsden Hospital (UK); Dirk H. J. Poot, Erasmus MC (Netherlands); Wiro J. Niessen, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands); Stefan Klein, Erasmus MC (Netherlands) . . . . . .[9034-23]

8:20 am: **A new method for joint susceptibility artifact correction and super-resolution for dMRI**, Lars Ruthotto, The Univ. of British Columbia (Canada); Siawoosh Mohammadi, Nikolaus Weiskopf, Wellcome Trust Ctr. for Neuroimaging (UK) . . . . . .[9034-24]

8:40 am: **A dual spherical model for multi-shell diffusion imaging**, Yogesh Rathi, Harvard Medical School (USA); Oleg V. Michailovich, Univ. of Waterloo (Canada); Kawin Setsompop, Carl-Fredrik Westin, Harvard Medical School (USA). . . . . .[9034-25]

9:00 am: **Multi-modal pharmacokinetic modeling for DCE-MRI: using diffusion weighted imaging to constrain the local arterial input function**, Valentin Hamy, Univ. College London (UK); Marc Modat, Univ College London (UK); Rebecca Shipley, Nikos Dikaios, Jon O. Cleary, David J. Hawkes, Shonit Punwani, Sebastien Ourselin, David Atkinson, Andrew Melbourne, Univ. College London (UK) . . . . . .[9034-26]

9:20 am: **Intramyocellular lipid dependence on skeletal muscle fiber type and orientation characterized by diffusion tensor imaging and 1H-MRS**, Sunil Kumar Valaparla, Feng Gao, Muhammad Abdul-Ghani, Geoffrey D. Clarke, The Univ. of Texas Health Science Ctr. at San Antonio (USA). . . . . .[9034-27]

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

9034 continues on page 32

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Model Observers: Imaging Applications

Session Chair: **Craig K. Abbey,** Univ. of California, Santa Barbara (USA)

8:00 am: **Comparing observer models and feature selection methods for a task-based assessment of digital breast tomosynthesis in reconstruction space**, Subok Park, George Z. Zhang, Rongping Zeng, Kyle J. Myers, U.S. Food and Drug Administration (USA) . . [9037-21]

8:20 am: **Polar-map model observers for perfusion defects localization and detection in SPECT myocardial perfusion imaging**, Felipe M. Parages, Illinois Institute of Technology (USA); J. Michael O'Connor, Univ. of Massachusetts Medical School (USA) and Univ. of Massachusetts Lowell (USA); Hendrik P. Pretorius, Univ. of Massachusetts Medical School (USA); Jovan G. Brankov, Illinois Institute of Technology (USA). . . .[9037-22]

8:40 am: **Design of a practical image-quality assessment method using real CT data**, Hsin-Wu Tseng, College of Optical Sciences, The Univ. of Arizona (USA); Jiahua Fan, GE Healthcare (USA); Matthew A. Kupinski, College of Optical Sciences, The Univ. of Arizona (USA); Paavana Sainath, GE Healthcare (USA) . . . . . .[9037-23]

9:00 am: **Comparison of computational to human observer detection for evaluation of CT low dose iterative reconstruction**, Brendan L. Eck, Rachid Fahmi, Case Western Reserve Univ. (USA); Kevin M. Brown, Nilgoun Raihani, Philips Healthcare (USA); David L. Wilson, Case Western Reserve Univ. (USA). . . . [9037-24]

9:20 am: **Assessment of prostate cancer detection with a visual-search human model observer**, Anando Sen, Faraz Kalantari, Howard C. Gifford, Univ. of Houston (USA) . . . . . .[9037-25]

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

9037 continues on page 32

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 5
Room: Royal Palm One . Mon 9:05 to 9:45 am

Myocardial Function

Session Chairs: **Armando Manduca,** Mayo Clinic College of Medicine (USA); **Amir A. Amini,** Univ. of Louisville (USA)

Joint Keynote with Conference 9033 - Physics of Medical Imaging
Room: Town & Country

8:00 am: **Noninvasive functional assessment of coronary artery disease using cardiac CT imaging and computational fluid dynamics** *(Keynote Presentation)*, Charles A. Taylor, HeartFlow, Inc. (USA) and Stanford Univ. (USA) . . . . . [9033-1]

9:05 am: **Dynamic CT myocardial perfusion imaging: detection of ischemia in a porcine model with FFR verification**, Rachid Fahmi, Brendan L. Eck, Case Western Reserve Univ. (USA); Xiaorong Zhou, Univ. Hospitals of Cleveland (USA); Mani Vembar, Philips Healthcare (USA); Hiram G. Bezerra, Univ. Hospitals of Cleveland (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . .[9038-23]

9:25 am: **Parametric myocardial perfusion PET imaging using physiological clustering**, Hassan Mohy-ud-Din, Nikolaos Karakatsanis, Martin A. Lodge, Johns Hopkins Univ. (USA); Jing Tang, Oakland Univ. (USA); Arman Rahmim, Johns Hopkins Univ. (USA) . . . . .[9038-24]

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

9038 continues on page 32

Conference 9041 continued
Digital Pathology
Room: Golden West

SESSION 3
Room: Golden West . . . . Mon 8:00 to 9:40 am

Imaging and Pathology Conversion

Session Chair: **Martin J. Yaffe,** Sunnybrook Research Institute (Canada)

8:00 am: **Detection of felt tip markers on microscope slides**, David Friedrich, Dietrich Meyer-Ebrecht, RWTH Aachen (Germany); Alfred Böcking, Institute of Pathology (Germany); Dorit Merhof, RWTH Aachen (Germany) . . . . . .[9041-4]

8:20 am: **Hot spot detection for breast cancer in Ki-67 stained slides: image dependent filtering approach**, Muhammad Khalid Khan Niazi, The Ohio State Univ. Medical Ctr. (USA); Erinn Downs-Kelly, The Cleveland Clinic (USA); Metin N. Gurcan, The Ohio State Univ. Wexner Medical Ctr. (USA). . . . . .[9041-5]

8:40 am: **Breast histopathology using random decision forests-based classification of infrared spectroscopic imaging data**, David Mayerich, Univ. of Illinois at Urbana-Champaign (USA); Michael J. Walsh, Andre Kadjacsy-Balla, Univ. of Illinois at Chicago (USA); Shachi Mittal, Indian Institute of Technology Delhi (India); Rohit Bhargava, Univ. of Illinois at Urbana-Champaign (USA) . . . . . .[9041-6]

9:00 am: **Quantitative analysis of stain variability in histology slides and an algorithm for standardization**, Babak Ehteshami Bejnordi, Nadya Timofeeva, Irene Otte-Höller, Nico Karssemeijer, Jeroen A. van der Laak, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . .[9041-7]

9:20 am: **Does the choice of display system influence perception and visibility of clinically relevant features in digital pathology images?**, Tom R. Kimpe, Johan Rostang, Barco N.V. (Belgium); Ali N. Avanaki, Kathryn S. Espig, Albert Xthona, Barco, Inc. (USA); Ioan Cocuranu, Anil V. Parwani, Liron Pantanowitz, Univ. of Pittsburgh Medical Ctr. (USA) . . . .[9041-8]

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

9041 continues on page 32

Monday · 17 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

CT and Applications

Session Chairs: **Taly G. Schmidt,** Marquette Univ. (USA); **Robert M. Nishikawa,** Univ. of Pittsburgh (USA)

10:10 am: **Dose reduction assessment in dynamic CT myocardial perfusion imaging in a porcine balloon-induced-ischemia model**, Rachid Fahmi, Brendan L. Eck, Case Western Reserve Univ. (USA); Xiaorong Zhou, Univ. Hospitals of Cleveland (USA); Mani Vembar, Philips Healthcare (USA); Hiram G. Bezerra, Univ. Hospitals of Cleveland (USA); David L. Wilson, Case Western Reserve Univ. (USA) . . . . . .[9033-4]

10:30 am: **Estimating lesion volume in low-dose chest CT: How low can we go?**, Stefano Young, Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA) . . . . . .[9033-5]

10:50 am: **A biological phantom for evaluation of CT image reconstruction algorithms**, Jochen Cammin, George S. Fung, Elliot K. Fishman, Johns Hopkins Outpatient Ctr. (USA); Jeffrey H. Siewerdsen, Joseph W. Stayman, Johns Hopkins Univ. (USA); Katsuyuki Taguchi, Johns Hopkins Outpatient Ctr. (USA) . . . . . .[9033-6]

11:10 am: **Impact of norm selections on the performance of four-dimensional cone-beam computed tomography (4DCBCT) using PICCS**, Yinsheng Li, Jie Tang, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . .[9033-7]

11:30 am: **3D image-based scatter estimation and correction for multi-detector CT imaging**, Martin Petersilka, Thomas Allmendinger, Karl Stierstorfer, Siemens Healthcare (Germany) . . .[9033-8]

11:50 am: **Small animal lung imaging with a benchtop in-line X-ray phase-contrast system**, Alfred Garson III, Washington Univ. in St. Louis (USA); Enrique Izaguirre, Scott & White Healthcare (USA); Samantha Price, Huifeng Guan, Sunil Vasireddi, Mark A. Anastasio, Washington Univ. in St. Louis (USA) . . . . . .[9033-9]

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

9033 continues on page 33

Conference 9034 continued
Image Processing
Room: San Diego

SESSION 6
Room: San Diego . Mon 10:10 am to 12:10 pm

Shape

Session Chairs: **Punam K. Saha,** The Univ. of Iowa (USA); **Cristian Lorenz,** Philips Research (Germany)

10:10 am: **A statistical Shape+Pose model for segmentation of wrist CT images**, Emran Mohammad Abu Anas, Abtin Rasoulian, The Univ. of British Columbia (Canada); Paul S. John, David R. Pichora, Kingston General Hospital (Canada); Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . .[9034-28]

10:30 am: **Statistical shape and appearance models without one-to-one correspondences**, Jan Ehrhardt, Julia Krüger, Heinz Handels, Univ. zu Lübeck (Germany) . . . . . .[9034-97]

10:50 am: **A framework for joint image-and-shape analysis**, Yi Gao, Allen Tannenbaum, The Univ. of Alabama at Birmingham (USA); Sylvain Bouix, Harvard Medical School (USA) . . . . . .[9034-30]

11:10 am: **Groupwise shape analysis of the hippocampus using spectral matching**, Mahsa Shakeri, Ecole Polytechnique de Montréal (Canada); Hervé J. Lombaert, McGill Univ. (Canada); Sarah Lippe, Univ. de Montréal (Canada) and CHU Sainte-Justine (Canada); Samuel Kadoury, Ecole Polytechnique de Montréal (Canada) and CHU Sainte-Justine (Canada) . . . . .[9034-31]

11:30 am: **3D shape analysis of heterochromatin foci based on a 3D spherical harmonics intensity model**, Simon Eck, Stefan Wörz, Ruprecht-Karls-Univ. Heidelberg (Germany) and Deutsches Krebsforschungszentrum (Germany); Katharina Müller-Ott, Ruprecht-Karls-Univ. Heidelberg (Germany); Matthias Hahn, Gunnar Schotta, Ludwig-Maximilians-Univ. München (Germany); Karsten Rippe, Ruprecht-Karls-Univ. Heidelberg (Germany); Karl Rohr, Ruprecht-Karls-Univ. Heidelberg (Germany) and Deutsches Krebsforschungszentrum (Germany) . . . . . .[9034-32]

11:50 am: **Improved Statistical Power with a Sparse Shape Model in Detecting an Aging Effect in the Hippocampus and Amygdala**, Moo K. Chung, Univ. of Wisconsin-Madison (USA); Seung-Goo Kim, Max Planck Institute (Germany); Stacey M. Schaefer, Univ. of Wisconsin-Madison (USA); Carien M. van Reekum, The Univ. of Reading (UK); Lara Peschke-Schmitz, Matt Sutterer, Richard J. Davidson, Univ. of Wisconsin-Madison (USA) . . . . . .[9034-33]

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

9034 continues on page 33

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Observer Performance: Breast

Session Chair: **Patrick C. Brennan,** The Univ. of Sydney (Australia)

10:10 am: **Does sensitivity measured from screening test-sets predict clinical performance?**, BaoLin P. Soh, The Univ. of Sydney (Australia) and Singapore General Hospital (Singapore); Warwick B. Lee, BreastScreen New South Wales (Australia); Claudia R. Mello-Thoms, Kriscia A. Tapia, The Univ. of Sydney (Australia); John T Ryan, Ziltron (Ireland); Wai Tak Hung, Graham J. Thompson, BreastScreen New South Wales (Australia); Rob Heard, Patrick C. Brennan, The Univ. of Sydney (Australia). . . . . .[9037-26]

10:30 am: **Modeling resident error-making patterns in detection of mammographic masses using computer-extracted image features: preliminary experiments**, Maciej A. Mazurowski, Jing Zhang, Joseph Y. Lo, Duke Univ. (USA); Cherie M. Kuzmiak, The Univ. of North Carolina at Chapel Hill (USA); Sujata V. Ghate, Sora Yoon, Duke Univ. (USA) . . . . . .[9037-27]

10:50 am: **Mammographic density measurement: a comparison of automated volumetric density measurement to BIRADS**, Christine N. Damases, The Univ. of Sydney (Australia) and Univ. of Namibia (Namibia); Mark F. McEntee, The Univ. of Sydney (Australia) . . . . . .[9037-28]

11:10 am: **Pursuing optimal thresholds to recommend breast biopsy by quantifying the value of tomosynthesis**, Yirong Wu, Oguzhan Alagoz, David J. Vanness, Amy Trentham-Dietz, Univ. of Wisconsin-Madison (USA); Elizabeth S. Burnside, Univ. of Wisconsin Hospital and Clinics (USA) . . . . . .[9037-29]

11:30 am: **Efficacy of digital breast tomosynthesis for breast cancer diagnosis** , Maram M. Alakhras, The Univ. of Sydney (Australia); Claudia R. Mello-Thoms, The Univ. of Sydney (Australia) and Univ. of Pittsburgh School of Medicine (USA); Mary Rickard, The Univ. of Sydney (Australia) and Sydney Breast Clinic (Australia); Roger Bourne, Patrick C. Brennan, The Univ. of Sydney (Australia) . . . . . .[9037-30]

11:50 am: **Retrieving phase information in sonography for improved microcalcification detection**, Sara Bahramian, Michael F. Insana, Univ. of Illinois at Urbana-Champaign (USA) . . . . . .[9037-31]

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

9037 continues on page 33

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 6
Room: Royal Palm One .Mon 10:10 to 11:50 am

Keynote and Molecular Imaging

Session Chairs: **Robert C. Molthen,** Medical College of Wisconsin (USA); **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA)

10:10 am: **Advancing technologies for preclinical molecular imaging** *(Keynote Presentation)*, Simon R. Cherry, Univ. of California, Davis (USA) . . . . . [9038-25]

11:10 am: **Complementary tumor vascularity imaging in a single PET-CT routine using FDG early dynamic blood flow and contrast-enhanced CT texture analysis**, Raz Carmi, Philips Healthcare (Israel); Nikolay Yefremov, Hanna Bernstine, David Groshar, Rabin Medical Ctr. (Israel) . . . . . .[9038-26]

11:30 am: **Biomarker sensing to assess cancer therapy**, John B. Weaver, Xiaojuan Zhang, Dartmouth Hitchcock Medical Ctr. (USA); Daniel B. Reeves, Dartmouth College (USA); Irina M. Perreard, Dartmouth Hitchcock Medical Ctr. (USA); Warren C. Kett, Karl E. Griswold, Thayer School of Engineering at Dartmouth (USA); Barjor Gimi, Venkata K. Nemani, Dartmouth Hitchcock Medical Ctr. (USA); Seiko Toraya-Brown, Steven Fiering, Dartmouth College (USA) and Geisel School of Medicine (USA) . . . . . .[9038-27]

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

9038 continues on page 33

Conference 9041 continued
Digital Pathology
Room: Golden West

SESSION 4
Room: Golden West Mon 10:10 am to 12:10 pm

Acquisition, Processing and Storage of Microscopic Images

Session Chair: **Anne L. Martel,** Sunnybrook Research Institute (Canada)

10:10 am: **Towards automatic patient selection for chemotherapy in colorectal cancer trials**, Alexander I. Wright, Derek R. Magee, Philip Quirke, Univ. of Leeds (UK); Darren E. Treanor, Univ. of Leeds (UK) and Leeds Teaching Hospitals NHS Trust (UK). . .[9041-9]

10:30 am: **Cascaded ensemble of convolutional neural networks and handcrafted features for mitosis detection**, Haibo Wang, Case Western Reserve Univ. (USA); Angel Cruz Roa, Univ. Nacional de Colombia (Colombia); Ajay N. Basavanhally, Rutgers, The State Univ. of New Jersey (USA); Hannah Gilmore, Case Western Reserve Univ. (USA); Fabio A. González Osorio, Univ. Nacional de Colombia (Colombia); Natalie Shih, Hospital of the Univ. of Pennsylvania (USA); Michael D. Feldman, The Univ. of Pennsylvania Health System (USA); John E. Tomaszewski, Univ. at Buffalo (USA); Anant Madabhushi, Case Western Reserve Univ. (USA) . . [9041-10]

10:50 am: **Grading vascularity from histopathological images based on traveling salesman distance and vessel size**, Muhammad Khalid Khan Niazi, Jessica Hemminger, Habibe Kurt, Gerard Lozanski, Metin N. Gurcan, The Ohio State Univ. (USA). . . . . .[9041-11]

11:10 am: **Automated high-throughput assessment of prostate biopsy tissue using infrared spectroscopic chemical imaging**, Paul Bassan, Ashwin Sachdeva, The Univ. of Manchester (UK); Jonathan Shanks, The Christie NHS Foundation Trust (UK); Michael D. Brown, Noel W. Clarke, The Paterson Institute for Cancer Research (UK) and The Univ. of Manchester (UK); Peter Gardner, The Univ. of Manchester (UK) . . . . . .[9041-12]

11:30 am: **A fast method for approximate registration of whole-slide images of serial sections using local curvature**, Nicholas A. Trahearn, David B. Epstein, The Univ. of Warwick (UK); David Snead, Univ. Hospitals Coventry and Warwickshire NHS Trust (UK); Ian A. Cree, Nasir M. Rajpoot, The Univ. of Warwick (UK) . . . . . .[9041-13]

11:50 am: **Classification of glioblastoma and metastasis for neuropathology intraoperative diagnosis: a multi-resolution textural approach to model the background**, Mohammad Faizal Ahmad Fauzi, The Ohio State Univ. (USA) and Multimedia Univ. (Malaysia); Hamza N. Gokozan, Brad Elder, Vinay K. Puduvalli, Jose J. Otero, Metin N. Gurcan, The Ohio State Univ. (USA)[9041-14]

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

9041 continues on page 33

Monday · 17 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

Phase Contrast Imaging
Session Chairs: **Mini Das,** Univ. of Houston (USA); **Thomas G. Flohr,** Siemens Healthcare (Germany), Eberhard Karls Univ. Tübingen (Germany)

1:20 pm: **Fast data acquisitions in X-ray differential phase contrast imaging using a new grating design**, Yongshuai Ge, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9033-10]

1:40 pm: **Slit-scanning differential phase-contrast mammography: first experimental results**, Ewald Roessl, Heiner Daerr, Thomas Koehler, Gerhard Martens, Udo van Stevendaal, Philips Technologie GmbH (Germany). . . [9033-11]

2:00 pm: **A multi-channel image reconstruction method for grating-based X-ray phase-contrast computed tomography**, Qiaofeng Xu, Alex Sawatzky, Mark A. Anastasio, Washington Univ. in St. Louis (USA) . . . . . [9033-12]

2:20 pm: **Simultaneous implementation of low dose and high sensitivity capabilities in differential phase contrast and dark-field imaging with laboratory x-ray sources**, Alessandro Olivo, Charlotte K. Hagen, Thomas P. Millard, Fabio A. Vittoria, Paul C. Diemoz, Marco Endrizzi, Univ. College London (UK) . . . . . [9033-13]

2:40 pm: **Cramer-Rao lower bound in differential phase contrast imaging and its application in the optimization of data acquisition system**, Ke Li, Yongshuai Ge, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9033-14]

3:00 pm: **Statistical signal estimation methods in X-ray differential phase contrast imaging**, Yongshuai Ge, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9033-15]

3:20 pm: **Investigation of in-line X-ray phase-contrast tomosynthesis using an advanced iterative algorithm**, Huifeng Guan, Qiaofeng Xu, Alfred Garson III, Mark A. Anastasio, Washington Univ. in St. Louis (USA) . . . . . [9033-16]

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

9033 continues on page 34

Conference 9034 continued
Image Processing
Room: San Diego

SESSION 7
Room: San Diego . . . . . Mon 1:20 to 3:40 pm

Keynote and Brain
Session Chairs: **David R. Haynor,** Univ. of Washington (USA); **Benoit M. Dawant,** Vanderbilt Univ. (USA)

1:20 pm: **Large scale digital atlases in neuroscience** *(Keynote Presentation)*, Michael J. Hawrylycz, Allen Institute for Brain Science (USA) . . . . . [9034-34]

2:40 pm: **Smoothness parameter tuning for generalized hierarchical continuous max-flow segmentation**, John S. H. Baxter, Martin Rajchl, A. Jonathan McLeod, Ali R. Khan, Jing Yuan, Terry M. Peters, Robarts Research Institute (Canada) . . . . . .[9034-35]

3:00 pm: **Bilayered anatomically-constrained split-and-merge expectation maximisation algorithm (BiASM) for brain segmentation**, Carole H. Sudre, M. Jorge Cardoso, Sébastien Ourselin, Univ. College London (UK) . . . . . .[9034-36]

3:20 pm: **Fast CEUS image segmentation based on self organizing maps**, Julie Paire, Univ. d'Auvergne (France); Vincent V. Sauvage, Adélaïde Albouy-Kissi, Instituts Universitaires de Technologie (France); Viviane Ladam Marcus, Claude Marcus, Christine Hoeffel, CHU de Reims (France) . . . . . .[9034-37]

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

9034 continues on page 34

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

Model Observers: General
Session Chair: **Subok Park,** U.S. Food and Drug Administration (USA)

1:20 pm: **Alternative applications of spatio-temporal contrast sensitivity in a 3D model observer**, Ali N. Avanaki, Kathryn S. Espig, Barco, Inc. (USA); Cedric Marchessoux, Barco N.V. (Belgium); Predrag R. Bakic, Univ. of Pennsylvania (USA); Tom R. Kimpe, Barco N.V. (Belgium); Andrew D. A. Maidment, Univ. of Pennsylvania (USA) . . . . . .[9037-32]

1:40 pm: **Human template estimation using a Gaussian processes algorithm**, Francesc Massanes, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . . .[9037-34]

2:00 pm: **A stereo matching model observer for stereoscopic viewing of 3D medical images**, Gezheng Wen, Mia K. Markey, The Univ. of Texas at Austin (USA); Gautam S. Muralidlhar, VuCOMP (USA) . . . . . .[9037-35]

2:20 pm: **A model observer based on human perception to quantify the detectability**, Georges Acharian, Trixell (France) and Gipsa-lab (France); Jean-Michel Vignolle, Trixell (France); Christian Jutten, Gipsa-lab (France) and Institut Univ. de France (France); Nathalie Guyader, Gipsa-lab (France) . . . .[9037-36]

2:40 pm: **Detectability and image quality metrics based on robust statistics: following non-linear, noise-reduction filters**, J. Eric Tkaczyk, Eri Haneda, GE Global Research (USA); Giovanni J. Palma, Razvan Iordache, Remy Klausz, Mathieu Garayt, GE Healthcare (France); Ann-Katherine Carton, GE Global Research (USA) and GE Healthcare (France) . . . . . .[9037-37]

3:00 pm: **Discovering common properties of human observers' visual search and mathematical observers' scanning I: theory and conjecture**, Xin He, Frank W. Samuelson, Rongping Zeng, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . . .[9037-33]

9037 continues on page 34

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 7
Room: Royal Palm One . Mon 1:20 to 3:40 pm

Lung
Session Chairs: **Merryn Tawhai,** The Univ. of Auckland (New Zealand); **Robert C. Molthen,** Medical College of Wisconsin (USA)

1:20 pm: **Early prediction of lung cancer recurrence after stereotactic radiotherapy using second order texture statistics**, Sarah A. Mattonen, Western Univ. Canada (Canada); David A. Palma, The Univ. of Western Ontario (Canada) and London Regional Cancer Ctr. (Canada); Cornelis J. Haasbeek, Suresh Senan, Vrije Univ. Medical Ctr. (Netherlands); Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . .[9038-28]

1:40 pm: **Dual-energy micro-CT imaging of pulmonary airway obstruction: correlation with micro-SPECT**, Cristian T. Badea, Nicholas T. Befera, Darin P. Clark, Yi Qi, G. Allan Johnson, Ctr. for In Vivo Microscopy (USA). . . . . .[9038-29]

2:00 pm: **Towards in vivo measurement of alveoli throughout the breathing lung**, Richard P. Carnibella, Marcus J. Kitchen, Andreas Fouras, Monash Univ. (Australia) . . . . . .[9038-30]

2:20 pm: **Investigation of pulmonary acoustics: comparing airway model generation techniques**, Brian Henry, Ying Peng, Zoujun Dai, Thomas Royston, Univ. of Illinois at Chicago (USA); Hansen Mansy, Univ. of Central Florida (USA); Richard Sandler, Nemours Children's Hospital, Orlando (USA) . . . . . .[9038-31]

2:40 pm: **Automated rat lung segmentation of low resolution CT scans**, Benjamin M. Rizzo, Marquette Univ. (USA); Steven T. Haworth, Medical College of Wisconsin (USA) and Zablocki Veterans Affairs Medical Ctr. (USA); Anne V. Clough, Marquette Univ. (USA) and Zablocki Veterans Affairs Medical Ctr. (USA) . . . . . .[9038-32]

9038 continues on page 34

Conference 9041 continued
Digital Pathology
Room: Golden West

SESSION 5
Room: Golden West . . . . Mon 1:20 to 3:20 pm

Observer Performance and Human Factors
Session Chair: **Elizabeth A. Krupinski,** The Univ. of Arizona (USA)

1:20 pm: **3D reconstruction of digitized histological sections for vasculature quantification in the mouse hind limb**, Yiwen Xu, The Univ. of Western Ontario (Canada); J. Geoffrey Pickering, Zengxuan Nong, Robarts Research Institute (Canada); Eli D. Gibson, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . [9041-15]

1:40 pm: **Toward digital staining using stimulated Raman scattering and statistical machine learning**, Koichi Tanji, Yoichi Otsuka, Shuya Satoh, Hiroyuki Hashimoto, Canon Inc. (Japan); Yasuyuki Ozeki, The Univ. of Tokyo (Japan); Kazuyoshi Itoh, Osaka Univ. (Japan). . . . . [9041-16]

2:00 pm: **Accuracy and variability of tumor burden measurement on multi-parametric MRI**, Mehrnoush Salarian, The Univ. of Western Ontario (Canada); Eli D. Gibson, Robarts Research Institute (Canada); Maysam Shahedi, Mena Gaed, José A. Gomez-Lemus, Madeleine Moussa, Cesare Romagnoli, Derek W. Cool, Matthew Bastian-Jordan, Joseph L. Chin, Stephen E. Pautler, Glenn S. Bauman, Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . [9041-17]

2:20 pm: **Ex-vivo optical coherence tomography of the human prostate after radical prostatectomy: preliminary results from a pilot study**, Berrend G. Muller, Daniel M. de Bruin, Willemien van den Bos, Martin J. Brandt, Dirk J. Faber, Maria P. Laguna-Pes, Ton G. van Leeuwen, Jean J. de la Rosette, Academisch Medisch Ctr. (Netherlands) . . . . . [9041-18]

9041 continues on page 34

Monday · 17 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

Conference 9034 continued
Image Processing
Room: San Diego

Conference 9037 continued
Image Perception, Observer Performance, and Technology Assessment
Room: California

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

3:20 pm: **Discovering common properties of human observers' visual search and mathematical observers' scanning II: predicting individual human and mathematical observers' performance**, Xin He, Frank W. Samuelson, Berkman Sahiner, U.S. Food and Drug Administration (USA). . [9037-38]

Poster Award Announcements
Room: California . . . . . Mon. 3:40 to 3:45 pm

The Image Perception, Observer Performance, and Technology Assessment conference poster award recipients will be recognized and certificates distributed.

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

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 7 (CONTINUED)
Room: Royal Palm One . Mon 1:20 to 3:40 pm

3:00 pm: **Development and application of pulmonary structure-function registration methods: towards pulmonary image-guidance tools for improved airway targeted therapies and outcomes**, Fumin Guo, Damien Pike, Sarah Svenningsen, Robarts Research Institute (Canada); Harvey O. Coxson, Vancouver General Hospital (Canada); John J. Drozd, Jing Yuan, Aaron Fenster, Grace Parraga, Robarts Research Institute (Canada) . . . . . .[9038-70]

3:20 pm: **Minimally interactive fuzzy connectedness segmentation of 4D dynamic upper airway MR images**, Yubing Tong, Jayaram K. Udupa, Dewey Odhner, Univ. of Pennsylvania (USA); Sanghun Sin, Raanan Arens, Children's Hospital at Montefiore (USA) . . . .[9038-34]

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

Conference 9041 continued
Digital Pathology
Room: Golden West

SESSION 4 (CONTINUED)
Room: Golden West . . . . Mon 1:20 to 3:20 pm

2:40 pm: **Enhancing effective depth-of-field using spectra-specific wavelets based multi-focus image fusion for digital pathology applications**, Sailesh Conjeti, Biswajoy Ghosh, Sri Phani K. Karri, Debdoot Sheet, Hrushikesh T. Garud, Jyotirmoy Chatterjee, Ajoy K. Ray, Indian Institute of Technology Kharagpur (India). . . . . [9041-19]

3:00 pm: **Tissue imaging using optical projection tomographic microscopy**, Qin Miao, Vivian W. Hou, Eric J. Seibel, Univ. of Washington (USA). . . . . .[9041-20]

Poster Award Announcements
Room: Golden West . . . . . Mon. 3:20 to 3:25 pm

The Digital Pathology conference poster award recipients will be recognized and certificates distributed.

Coffee Break . . . . . .Mon 3:20 to 4:00 pm

Best Student Paper Award and Plenary Presentation

Monday 17 February · 4:00 to 5:15 pm · Location: Town & Country Room

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

Robert F. Wagner Student Paper Award Announcement

Plenary Presentation: **The emerging role of quantitative imaging biomarkers**
John C. Gore, Vanderbilt Univ. Medical Ctr. (USA)

9033 continues on page 35

9034 continues on page 35

Conference 9037 ENDS

9038 continues on page 35

Conference 9041 ENDS

Tuesday · 18 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 4
Room: Town & Country . .Tue 8:00 to 9:40 am

Algorithms

Session Chairs: **John Yorkston,** Carestream Health, Inc. (USA); **Kirsten Boedeker,** Toshiba Medical Research Institute USA (USA)

8:00 am: **Removing blooming artifacts with binarized deconvolution in cardiac CT**, Christian Hofmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Knaup, German Cancer Research Center (DKFZ) (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany). . . . . [9033-17]

8:20 am: **Automatic cable artifact removal for cardiac C-arm CT imaging**, Christian Haase, Dirk Schäfer, Philips Technologie GmbH (Germany); Michael Kim, S. James Chen, John D. Carroll, Univ. of Colorado (USA); Peter G. Eshuis, Philips Healthcare (Netherlands); Olaf Dössel, Karlsruher Institut für Technologie (Germany); Michael Grass, Philips Technologie GmbH (Germany). . .[9033-18]

8:40 am: **Ringing artifact reduction for metallic objects in direct digital radiography detectors with stationary antiscatter grids**, Dong Sik Kim, Hankuk Univ. of Foreign Studies (Korea, Republic of); Sanggyun Lee, DRTECH Corp. (Korea, Republic of). . . . . [9033-19]

9:00 am: **Algorithms for optimizing CT fluence control**, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . . .[9033-20]

9:20 am: **Towards in-vivo K-edge imaging using a new semi-analytical calibration method**, Carsten O. Schirra, Philips Research North America (USA); Axel Thran, Heiner Daerr, Ewald Roessl, Roland M. Proksa, Philips Research Labs. (Germany) . . . . . .[9033-21]

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

9033 continues on page 36

Conference 9034 continued
Image Processing
Room: San Diego

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

Classification and Texture

Session Chair: **Baowei Fei,** Emory Univ. (USA); **Tomaž Vrtrovec,** Univ. of Ljubljana (Slovenia)

8:00 am: **Spectral-spatial classification using tensor modeling for head and neck cancer detection of hyperspectral imaging**, Guolan Lu, Emory Univ. (USA) and Georgia Institute of Technology (USA); Luma V. Halig, Dongsheng Wang, Zhuo Georgia Chen, Emory Univ. (USA); Baowei Fei, Emory Univ. (USA) and Georgia Institute of Technology (USA). . . .[9034-38]

8:20 am: **Texture feature analysis for prediction of postoperative liver failure prior to surgery**, Amber L. Simpson, Vanderbilt Univ. (USA); Richard K. Do, Memorial Sloan-Kettering Cancer Ctr. (USA); E. Patricia Parada, Pathfinder Therapeutics, Inc. (USA); Michael I. Miga, Vanderbilt Univ. (USA); William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (USA) . . . . . .[9034-39]

8:40 am: **Detection and location of 127 anatomical landmarks in diverse CT datasets**, Mohammad A. Dabbah, Sean Murphy, Hippolyte Pello, Romain Courbon, Erin Beveridge, Stewart Wiseman, Daniel Wyeth, Ian Poole, Toshiba Medical Visualization Systems Europe, Ltd. (UK). . . . . .[9034-40]

9:00 am: **Unsupervised detection of abnormalities in medical images using salient features**, Sharon Alpert, Pavel Kisilev, IBM Research - Haifa (Israel) . . . . . .[9034-41]

9:20 am: **Recognizing surgeon's actions during suture operations from video sequences**, Ye Li, Jun Ohya, Waseda Univ. (Japan); Toshio Chiba, National Research Institute for Child Health and Development (Japan); Rong Xu, Waseda Univ. (Japan); Hiromasa Yamashita, National Research Institute for Child Health and Development (Japan). . . . . .[9034-42]

Poster Award Announcements
Room: San Diego . . . . .9:40 am to 9:45 am
The Image Processing conference poster award recipients will be recognized and certificates distributed.

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

9034 continues on page 36

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

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

CAD Successes and Failures

Session Chairs: **Stephen Aylward,** Kitware, Inc. (USA); **Lubomir M. Hadjiiski,** Univ. of Michigan Health System (USA)

The CAD field has been the inspiration for significant advances is image processing, machine learning, user interfaces, experimental design, clinical systems integration, and many other areas. However, as with every form of science, there have been CAD failures, and often as much is learned from our failures as from our successes. This panel discussion will provide a forum for leaders in academia and industry to present their most significant successes and failures. The goal of the panel discussion is for the panel members and the audience to collaboratively discover the common threads that permeate the panel members' experiences. The expectation is that such discoveries will help the field continue to grow along the most productive trajectories while also identifying new areas of exploration that exist in the gaps between the successes and failures discussed.

Panel Moderators:
Stephen Aylward, Kitware, Inc. (USA)
Lubomir M. Hadjiiski, Univ. of Michigan Health System (USA);
Panel Members: **Matthew Freedman**, Georgetown Univ. Medical Ctr. (USA); **Jeff Hoffmeister**, iCAD, Inc. (USA); **Robert Nishikawa**, Univ. of Pittsburgh (USA); **Carol L. Novak**, Siemens Corp., Corporate Technology (USA); **Lee Rosen**, National Institutes of Health (USA); **Bram van Ginneken**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Steve Worrell**, Riverain Medical (USA)

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

9035 continues on page 36

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

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

Abdominal Procedures

Session Chairs: **Pierre Jannin,** Univ. de Rennes 1 (France); **Ivo Wolf,** Hochschule Mannheim (Germany)

8:00 am: **Innovative approach for in-vivo ablation validation on multimodal images**, Osama Shahin, Univ. zu Lübeck (Germany); Georgios Karagkounis, Daniel Carnegie, Johns Hopkins Univ. (USA); Alexander Schlaefer, Univ. zu Lübeck (Germany); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . [9036-1]

8:20 am: **Model-based formalization of medical knowledge for context-aware assistance in laparoscopic surgery**, Darko Katic, Karlsruher Institut für Technologie (Germany); Anna-Laura Wekerle, UniversitätsKlinikum Heidelberg (Germany); Fabian Gärtner, Karlsruher Institut für Technologie (Germany); Hannes Kenngott, Ruprecht-Karls-Univ. Heidelberg (Germany); Beat Peter Müller-Stich, Heidelberg School of Medicine (Germany); Rüdiger Dillmann, Stefanie Speidel, Karlsruher Institut für Technologie (Germany). . . . . [9036-2]

8:40 am: **Software-assisted post-interventional assessment of radiofrequency ablation**, Christian Rieder, Benjamin Geisler, Fraunhofer MEVIS (Germany); Philipp Bruners, RWTH Aachen (Germany); Peter Isfort, Hong-Sik Na, RWTH Aachen (Germany); Andreas H. Mahnken, Univ. Hospital Aachen (Germany); Horst K. Hahn, Fraunhofer MEVIS (Germany). . . . . [9036-3]

9:00 am: **Anatomical parameterization for volumetric meshing of the liver**, Sergio Vera, Alma IT Systems (Spain); Miguel Angel González Ballester, Alma IT Systems (Spain) and ICREA - Catalan Institution for Research and Advanced Studies (Spain) and Univ. Pompeu Fabra (Spain); Debora Gil, Univ. Autònoma de Barcelona (Spain) . . . . [9036-4]

9:20 am: **Preliminary clinical trial in percutaneous nephrolithotomy using a real-time navigation system for percutaneous kidney access**, Pedro L. Rodrigues, António H. J. Moreira, Univ. do Minho (Portugal); Nuno F. Rodrigues, Univ. do Minho (Portugal) and Instituto Politécnico do Cávado e do Ave (Portugal); Antonio C. M. Pinho, Jaime C. Fonseca, Estevão Lima, Univ. do Minho (Portugal); João L. Vilaça, Univ. do Minho (Portugal) and Instituto Politécnico do Cávado e do Ave (Portugal) . . . . . [9036-5]

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

9036 continues on page 36

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

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

Bone

Session Chairs: **Erik L. Ritman,** Mayo Clinic College of Medicine (USA); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA)

8:00 am: **Predicting the biomechanical strength of proximal femur specimens with Minkowski functionals and support vector regression**, Chien-Chun Yang, Mahesh B. Nagarajan, Markus B. Huber, Univ. of Rochester Medical Ctr. (USA); Julio Carballido-Gamio, Univ. of California, San Francisco (USA); Jan S. Bauer, Thomas H. Baum, Institut für Röntgendiagnostik (Germany); Felix Eckstein, Eva-Maria Lochmüller, Paracelsus Medizinische Privatuniversität (Austria); Thomas M. Link, Univ. of California, San Francisco (USA); Axel Wismüller, Univ. of Rochester Medical Ctr. (USA). . . . . .[9038-35]

8:20 am: **Phase contrast imaging X-ray computed tomography: Quantitative characterization of human patellar cartilage matrix with topological and geometrical features**, Mahesh B. Nagarajan, Univ. of Rochester Medical Ctr. (USA); Paola Coan, Ludwig-Maximilians-Univ. München (Germany) and European Synchrotron Radiation Facility (France); Markus B. Huber, Univ. of Rochester Medical Ctr. (USA); Paul C. Diemoz, Ludwig-Maximilians-Univ. München (Germany) and European Synchrotron Radiation Facility (France); Axel Wismüller, Univ. of Rochester Medical Ctr. (USA) and Ludwig-Maximilians-Univ. München (Germany) . . . . . .[9038-36]

8:40 am: **Bone vascularization: a way to study bone microarchitecture**, Pauline Bléry, L'Univ. Nantes Angers Le Mans (France); Florent Autrusseau, Univ. de Nantes (France); Eleonore Crauste, Erwan Freuchet, Pierre Weiss, Jean-Pierre V. Guédon, Yves Amouriq, L'Univ. Nantes Angers Le Mans (France) . . . . . .[9038-37]

9:00 am: **Automatic classification of squamosal abnormality in micro-CT images for the evaluation of rabbit fetal skull defects using active shape models**, Antong Chen, Belma Dogdas, Saurin Mehta, Ansuman Bagchi, Christopher Winkelmann, L. David Wise, Merck & Co., Inc. (USA) . . . . . .[9038-38]

9:20 am: **Automated segmentation of knee and ankle regions of rats from CT images to quantify bone mineral density for monitoring treatments of rheumatoid arthritis**, Francisco Cruz, Merck & Co., Inc. (USA) . . . . . .[9038-39]

Poster Award Announcements
Room: Royal Palm One . 9:40 am to 9:45 am
The poster award recipients will be recognized and certificates distributed.

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

9038 continues on page 36

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 5
Room: Town & Country . . . . . Tue 10:10 am to 12:10 pm

CT Reconstructions

Session Chairs: **Guang-Hong Chen,** Univ. of Wisconsin-Madison (USA); **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany)

10:10 am: **Regularization design and control of change admission in prior-image-based reconstruction**, Hao Dang, Jeffrey H. Siewerdsen, Joseph W. Stayman, Johns Hopkins Univ. (USA) . . . . . .[9033-22]

10:30 am: **Novel iterative reconstruction method for optimal dose usage in redundant CT-acquisitions**, Herbert K. Bruder, Rainer Raupach, Thomas Allmendinger, Steffen G. Kappler, Karl Stierstorfer, Thomas G. Flohr, Siemens Healthcare (Germany). . . . . .[9033-23]

10:50 am: **FINESSE: a Fast Iterative Non-linear Exact Sub-space SEarch based algorithm for CT imaging**, Katharina Schmitt, The Univ. of Utah (USA) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Harald Schöndube, Karl Stierstorfer, Siemens AG (Germany); Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Frédéric Noo, The Univ. of Utah (USA) . . . . . .[9033-24]

11:10 am: **A new approach to regularized iterative CT image reconstruction**, Christian Hofmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Knaup, German Cancer Research Center (DKFZ) (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany). . . . . .[9033-25]

11:30 am: **A practical statistical polychromatic image reconstruction for computed tomography using spectrum binning**, Meng Wu, Stanford Univ. (USA); Qiao Yang, Friedrich-Alexander Univ. Erlangen-Nürnberg (Germany); Andreas K. Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rebecca Fahrig, Stanford Univ. (USA). . . . . .[9033-26]

11:50 am: **Investigation of an efficient short-scan C-arm reconstruction method with radon-based redundancy handling**, Frank Dennerlein, Holger Kunze, Siemens AG (Germany) . . . . . .[9033-27]

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

9033 continues on page 37

Conference 9034 continued
Image Processing
Room: San Diego

SESSION 9
Room: San Diego . Tue 10:10 am to 12:10 pm

Registration

Session Chair: **Josien P. W. Pluim,** Univ. Medical Ctr. Utrecht (Netherlands)

10:10 am: **Bernd Fischer Commemorative Talk**, Jan Modersitzki, Univ. zu Lübeck (Germany) . . . . .[9034-43]

10:30 am: **MR to CT registration of brains using image synthesis**, Snehashis Roy, Henry M. Jackson Foundation (USA); Aaron Carass, Amod Jog, Jerry L. Prince, Junghoon Lee, Johns Hopkins Univ. (USA). . . . . .[9034-44]

10:50 am: **Fast automatic estimation of the optimization step size for nonrigid image registration**, Yuchuan Qiao, Boudewijn P. F. Lelieveldt, Marius Staring, Leiden Univ. Medisch Ctr. (Netherlands). . . . . .[9034-45]

11:10 am: **Detection and correction of inconsistency-based errors in non-rigid registration**, Tobias Gass, Gàbor Székely, Orcun Goksel, ETH Zurich (Switzerland) . . . . . .[9034-46]

11:30 am: **A rib-specific multimodal registration algorithm for fused unfolded rib visualization using PET/CT**, Jens N. Kaftan, Marcin Kopaczka, Siemens Molecular Imaging (UK); Andreas Wimmer, Siemens Computed Tomography (Germany); Günther Platsch, Jerome Declerck, Siemens Molecular Imaging (UK) . . . . . .[9034-47]

11:50 am: **A symmetric block-matching framework for global registration**, Marc Modat, David M. Cash, Pankaj Daga, Gavin P. Winston, John S. Duncan, Sebastien Ourselin, Univ. College London (UK). . . . . .[9034-48]

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

9034 continues on page 37

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 2
Room: Golden West Tue 10:10 am to 12:10 pm

Head, Neck, and Novel Methods

Session Chairs: **Marius George Linguraru,** Children's National Medical Ctr. (USA); **Eva M. van Rikxoort,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

10:10 am: **Early detection of Alzheimer's disease using histograms in a dissimilarity-based classification framework**, Anne Luchtenberg, Rita Simões, Univ. Twente (Netherlands); Anne-Marie van Cappellen van Walsum, Univ. Twente (Netherlands) and Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Cornelis H. Slump, Univ. Twente (Netherlands). . . . . .[9035-79]

10:30 am: **Multi-fractal texture features for brain tumor and edema segmentation**, Syed Reza, Khan M. Iftekharuddin, Old Dominion Univ. (USA) . . . . . .[9035-2]

10:50 am: **Ischemic stroke lesion segmentation in multi-spectral MR images with support vector machine classifiers**, Oskar Maier, Matthias Wilms, Janina von der Gablentz, Ulrike Krämer, Heinz Handels, Univ. zu Lübeck (Germany) . . . . . .[9035-3]

11:10 am: **A ROC-based feature selection method for computer-aided detection and diagnosis**, Songyuan Wang, Fourth Military Medical Univ. (China) and Xidian Univ. (China); Guopeng Zhang, Fourth Military Medical Univ. (China); Junying Zhang, Xidian Univ. (China); Qimei Liao, Hongbing Lu, Fourth Military Medical Univ. (China) . . . . . .[9035-4]

11:30 am: **Change detection of medical images using dictionary learning techniques and PCA**, Varvara Nika, York Univ. (Canada); Paul Babyn, Royal Univ. Hospital (Canada); Hongmei Zhu, York Univ. (Canada). . . . . .[9035-5]

11:50 am: **Segmentation and automated measurement of chronic wound images: probability map approach**, Mohammad Faizal Ahmad Fauzi, Ohio State Univ. (USA) and Multimedia Univ. (Malaysia); Ibrahim Khansa, Karen Catignani, Gayle Gordillo, Chandan K. Sen, Metin N. Gurcan, The Ohio State Univ. (USA) . . . . . .[9035-6]

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

9035 continues on page 37

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

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

Laparoscopy/Endoscopy/ Bronchoscopy/Colonoscopy

Session Chairs: **William E. Higgins,** The Pennsylvania State Univ. (USA); **Kensaku Mori,** Nagoya Univ. (Japan)

10:10 am: **Construction of a multimodal CT-video chest model**, Patrick Byrnes, William E. Higgins, The Pennsylvania State Univ. (USA) . . . . . .[9036-6]

10:30 am: **Visual tracking of da Vinci instruments for laparoscopic surgery**, Stefanie Speidel, Enrico Kuhn, Karlsruher Institut für Technologie (Germany); Sebastian Bodenstedt, Karlsruhe Institute of Technology (Germany); Sebastian Röhl, Karlsruher Institut für Technologie (Germany); Hannes Kenngott, Ruprecht-Karls-Univ. Heidelberg (Germany); Beat Peter Müller-Stich, Heidelberg School of Medicine (Germany); Rüdiger Dillmann, Karlsruher Institut für Technologie (Germany) . . . . . .[9036-7]

10:50 am: **Computer-assisted polyp matching between optical colonoscopy and CT colonography: a phantom study**, Holger R. Roth, Univ. College London (UK) . . . . . .[9036-8]

11:10 am: **Adaptive fiducial-free registration using multiple point selection for real-time electromagnetically navigated endoscopy**, Xiongbiao Luo, Kensaku Mori, Nagoya Univ. (Japan) . . . . . .[9036-9]

11:30 am: **Physiological factors of small intestine in experimentation of virtual video capsule endoscope**, Liang Mi, Guanqun Bao, Kaveh Pahlavan, Worcester Polytechnic Institute (USA). . . . . .[9036-10]

11:50 am: **Motion magnification for endoscopic surgery**, A. Jonathan McLeod, Terry M. Peters, Robarts Research Institute (Canada). . . . . [9036-11]

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

9036 continues on page 37

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 9
Room: Royal Palm One . . . . .Tue 10:10 am to 12:10 pm

Microenvironment and Magnetic Particle Imaging

Session Chairs: **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA); **Thorsten M. Buzug,** Univ. zu Lübeck (Germany)

10:10 am: **Hybrid framework based on evidence theory for blood cell image segmentation**, Amir Nakib, Univ. Paris-Est Créteil Val de Marne (France) and LISSI (France) . . . . . .[9038-40]

10:30 am: **On the way to a patient table integrated scanner system in magnetic particle imaging**, Christian Kaethner, Mandy Ahlborg, Ksenija Gräfe, Gael Bringout, Univ. zu Lübeck (Germany); Timo F. Sattel, Philips Medizin Systeme GmbH (Germany); Thorsten M. Buzug, Univ. zu Lübeck (Germany) . . . . . .[9038-41]

10:50 am: **Assessment of MR imaging agent targeting of tumor micro-metastases using cryo-imaging**, Mohammed Q. Qutaish, Zhuxian Zhou, Mallory R. Busso, Zheng-Rong Lu, David L. Wilson, Case Western Reserve Univ. (USA) . . . . . .[9038-42]

11:10 am: **A preliminary evaluation of self-made nanobubble in contrast-enhanced ultrasound imaging**, Chunfang Li, Kaizhi Wu, Jing Li, Haijuan Liu, Qibing Zhou, Mingyue Ding, Huazhong Univ. of Science and Technology (China) .[9038-43]

11:30 am: **Quantum dot-sized organic fluorescent dots for long-term cell tracing**, Kai Li, A*STAR Institute of Materials Research and Engineering (Singapore); Bin Liu, National Univ. of Singapore (Singapore); Ben Zhong Tang, Hong Kong Univ. of Science and Technology (Hong Kong, China) .[9038-44]

11:50 am: **Spectral diffusion: an algorithm for robust material decomposition of spectral CT data**, Darin P. Clark, G. Allan Johnson, Cristian T. Badea, Ctr. for In Vivo Microscopy (USA) . . . . . .[9038-45]

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

9038 continues on page 37

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 6
Room: Town & Country . .Tue 1:20 to 3:00 pm

Reconstruction

Session Chairs: **Jinyi Qi,** Univ. of California, Davis (USA); **Despina Kontos,** The Univ. of Pennsylvania Health System (USA)

1:20 pm: **Statistical Image Reconstruction with fast convergence via denoised ordered-subset statistically penalized algebraic reconstruction technique (DOS-SPART)**, Yinsheng Li, Jie Tang, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . .[9033-28]

1:40 pm: **Toward a dose reduction strategy using model-based reconstruction with limited-angle tomosynthesis**, Eri Haneda, J. Eric Tkaczyk, GE Global Research (USA); Giovanni J. Palma, Razvan Iordache, GE Healthcare France (France); Scott Zelakiewicz, GE Global Research (USA); Serge L. Muller, GE Healthcare France (France); Bruno De Man, GE Global Research (USA) . . . . . .[9033-29]

2:00 pm: **Enhancing tissue structures with iterative image reconstruction for digital breast tomosynthesis**, Emil Y. Sidky, Ingrid S. Reiser, The Univ. of Chicago Medical Ctr. (USA); Robert M. Nishikawa, Univ. of Pittsburgh (USA) . . . . . .[9033-30]

2:20 pm: **Estimation of sparse null space functions for compressed sensing in SPECT**, Joyeeta M. Mukherjee, Univ. of Massachusetts Medical School (USA); Emil Y. Sidky, The Univ. of Chicago Medical Ctr. (USA); Michael A. King, Univ. of Massachusetts Medical School (USA) . . . . . .[9033-31]

2:40 pm: **Whole-body PET parametric imaging employing direct 4D nested reconstruction and a generalized non-linear Patlak model**, Nicolas Karakatsanis, Arman Rahmim, Johns Hopkins Univ. (USA) . . . . . .[9033-32]

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

9033 continues on page 38

Conference 9034 continued
Image Processing
Room: San Diego

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

Atlas-based Segmentation

Session Chair: **Bennett A. Landman,** Vanderbilt Univ. (USA)

1:20 pm: **Statistical label fusion with hierarchical performance models**, Andrew J. Asman, Alexander S. Dagley, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9034-49]

1:40 pm: **Applying the algorithm assessing quality using registration circuits (AQUIRC) to multi-atlas segmentation**, Ryan Datteri, Benoit M. Dawant, Vanderbilt Univ. (USA) . .[9034-50]

2:00 pm: **Robust optic nerve segmentation on clinically acquired CT**, Swetasudha Panda, Andrew J. Asman, Michael P. DeLisi, Louise A. Mawn, Robert L. Galloway Jr., Bennett A. Landman, Vanderbilt Univ. (USA) . . . . . .[9034-51]

2:20 pm: **Spatially adapted augmentation of age-specific atlas-based segmentation using patch-based priors**, Mengyuan Liu, Sharmishtaa Seshamani, Lisa Harrylock, Averi Kitsch, Univ. of Washington (USA); Steven Miller, The Child & Family Research Institute (Canada); Van Chau, Kenneth Poskitt, Child & Family Research Institute (Canada); Francois Rousseau, Univ. de Strasbourg (France); Colin Studholme, Univ. of Washington (USA). . . . . .[9034-52]

2:40 pm: **Personalized articulated atlas with a dynamic adaptation strategy for bone segmentation in CT or CT/MR head and neck images**, Sebastian Steger, Florian Jung, Stefan Wesarg, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . . . . . .[9034-53]

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

9034 continues on page 38

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

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

Prostate and Colon I

Session Chairs: **Janne J. Näppi,** Massachusetts General Hospital (USA); **Maryellen L. Giger,** The Univ. of Chicago (USA)

1:20 pm: **Reference-tissue correction of T2-weighted signal intensity for prostate cancer detection**, Yahui Peng, Yulei Jiang, Aytekin Oto, The Univ. of Chicago Medical Ctr. (USA) . . . . . .[9035-7]

1:40 pm: **Computer-extracted texture features on T2w MRI to predict biochemical recurrence following radiation therapy for prostate cancer**, Shoshana Ginsburg, Mirabela Rusu, Case Western Reserve Univ. (USA); John Kurhanewicz, Univ. of California, San Francisco (USA); Anant Madabhushi, Case Western Reserve Univ. (USA). . . . .[9035-8]

2:00 pm: **Multi-atlas propagation via a manifold graph on a database of both labeled and unlabeled images**, Qinquan Gao, Tong Tong, Daniel Rueckert, Philip Edwards, Imperial College London (UK) . . . . . .[9035-9]

2:20 pm: **Automated polyp measurement based on colon structure decomposition for CT colonography**, Huafeng Wang, Stony Brook Univ. (USA); Lihong C. Li, College of Staten Island (USA); Hao Han, Hao Peng, Bowen Song, Zhengrong Liang, Stony Brook Univ. (USA) . . . . . .[9035-10]

2:40 pm: **An improved high order texture features extraction method with application to pathological diagnosis of colon lesions for CT colonography**, Bowen Song, Stony Brook Medicine (USA); Guopeng Zhang, Hongbing Lu, Fourth Military Medical Univ. (China); Huafeng Wang, Fangfang Han, Stony Brook Medicine (USA); Zhu Wei, Stony Brook Univ. (USA); Zhengrong Liang, Stony Brook Medicine (USA) . . . . . .[9035-11]

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

9035 continues on page 38

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

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

Novel Intraoperative Imaging and Visualization

Session Chairs: **David R. Haynor,** Univ. of Washington (USA); **Eric J. Seibel,** Univ. of Washington (USA)

1:20 pm: **Reconstruction and feature selection for desorption electrospray ionization mass spectroscopy imagery**, Yi Gao, Liangjia Zhu, The Univ. of Alabama at Birmingham (USA); Isaiah Norton, Brigham and Women's Hospital (USA); Nathalie Y. R. Agar, Harvard Medical School (USA); Allen Tannenbaum, The Univ. of Alabama at Birmingham (USA). . . . . [9036-12]

1:40 pm: **Automatic standard plane adjustment on mobile C-Arm CT images of the calcaneus using atlas-based feature registration**, Michael Brehler, German Cancer Research Center (DKFZ) (Germany); Joseph Görres, Deutsches Krebsforschungszentrum (Germany); Ivo Wolf, Hochschule Mannheim (Germany); Jochen Franke, Jan von Recum, Paul A. Gruetzner, BG Unfallklinik (Germany); Hans-Peter Meinzer, Diana Wald, Deutsches Krebsforschungszentrum (Germany)[9036-13]

2:00 pm: **Mechanically assisted 3D ultrasound for pre-operative assessment and guiding percutaneous treatment of focal liver tumors**, Hamid Sadeghi Neshat, Robarts Research Institute (Canada); Jeffery S. Bax, Azi Ben-Iavi, Ctr. for Imaging Technology Commercialization (Canada); Kevin Barker, Lori Gardi, Robarts Research Institute (Canada); Jason Chedalavadaa, Univ. of Southampton (UK); Nirmal Kakani, The Univ. of Western Ontario (Canada); Aaron Fenster, Robarts Research Institute (Canada) . . . . . .[9036-14]

2:20 pm: **Optoacoustic sensing for target detection inside cylindrical catheters**, Behnoosh Tavakoli, Xiaoyu Guo, Russell H. Taylor, Jin U. Kang, Johns Hopkins Univ. (USA); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . . . . . [9036-15]

2:40 pm: **Polarization-sensitive multispectral imaging for optimizing intestinal anastomosis placements**, Jaepyeong Cha, Johns Hopkins Univ. (USA); Brian Triana, Children's National Medical Ctr. (USA) and Princeton Univ. (USA); Azad Shademan, Axel Krieger, Peter C. W. Kim, Children's National Medical Ctr. (USA); Jin U. Kang, Johns Hopkins Univ. (USA) . . [9036-16]

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

9036 continues on page 38

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 10
Room: Royal Palm One . .Tue 1:20 to 3:00 pm

MR Elastrography

Session Chairs: **Armando Manduca,** Mayo Clinic College of Medicine (USA); **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA)

1:20 pm: **Investigation of the human brainstem with magnetic resonance elastography**, Curtis L. Johnson, Joseph L. Holtrop, Univ. of Illinois at Urbana-Champaign (USA); Matthew D. McGarry, Dartmouth College (USA); John B. Weaver, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA); Bradley P. Sutton, John G. Georgiadis, Univ. of Illinois at Urbana-Champaign (USA) . . . . . .[9038-46]

1:40 pm: **Imaging hydraulic conductivity in tofu phantoms using poroelastic MR elastography**, Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA) and Dartmouth Hitchcock Medical Ctr. (USA); Adam J. Pattison, Matthew D. McGarry, Thayer School of Engineering at Dartmouth (USA); John B. Weaver, Dartmouth College (USA) and Dartmouth Hitchcock Medical Ctr. (USA). . . . . .[9038-47]

2:00 pm: **Inversion of poroelastic and viscoelastic simulated MR elastography data at high and low actuation frequencies**, Matthew D. McGarry, Thayer School of Engineering at Dartmouth (USA); John B. Weaver, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA) and Dartmouth Hitchcock Medical Ctr. (USA). . . . . .[9038-48]

2:20 pm: **MRE detection of heterogeneity using quantitative measures of residual error and uncertainty**, Ruth J. Okamoto, Washington Univ. in St Louis (USA); Curtis L. Johnson, Univ. of Illinois at Urbana-Champaign (USA); Yuan Feng, Washington Univ. in St. Louis (USA); John G. Georgiadis, Univ. of Illinois at Urbana-Champaign (USA); Philip V. Bayly, Washington Univ. in St. Louis (USA). . . . . .[9038-49]

2:40 pm: **Utilizing a reference material for assessing absolute tumor mechanical properties in modality independent elastography**, Dong Kyu Kim, Jared A. Weis, Thomas E. Yankeelov, Michael I. Miga, Vanderbilt Univ. (USA). . . . . .[9038-50]

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

9038 continues on page 38

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 7
Room: Town & Country . .Tue 3:30 to 4:50 pm

Cone Beam CT and Novel Design

Session Chairs: **Stephen J. Glick,** Univ. of Massachusetts Medical School (USA); **Michael Grass,** Philips Research (Germany)

3:30 pm: **Rapid scatter estimation for CBCT using the Boltzmann transport equation**, Mingshan Sun, Varian Medical Systems, Inc. (USA); Alex Maslowski, Todd Wareing, Greg Failla, Transpire, Inc. (USA); Josh M. Star-Lack, Varian Medical Systems, Inc. (USA) . . . . . .[9033-33]

3:50 pm: **A patient-specific scatter artifacts correction method**, Wei Zhao, Guang-Hong Chen, Stephen Brunner, Univ. of Wisconsin-Madison (USA) . . . .[9033-34]

4:10 pm: **Development and evaluation of a novel designed breast CT system**, Claudia Braun, Oleg Tischenko, Helmut Schlattl, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany) . . . . . .[9033-35]

4:30 pm: **Effective one step-iterative fiducial marker-based compensation for involuntary motion in weight-bearing c-arm conebeam CT scanning of knees**, Jang-Hwan Choi, Stanford Univ. (USA); Andreas K. Maier, Martin Berger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rebecca Fahrig, Stanford Univ. (USA) . . . . . .[9033-36]

WORKSHOP
X-ray Sources
Town & Country · Tues. 5:00 to 7:00 pm
Workshop Chairs: **Bruce Whiting**, Univ. of Pittsburgh (USA) and **Christoph Hoeschen**, Helmholtz Zentrum München GmbH (Germany)
For details see page 15.

9033 continues on page 48

Conference 9034 continued
Image Processing
Room: San Diego

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

Magnetic Resonance Imaging

Session Chairs: **Olivier Salvado,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Sunanda D. Mitra,** Texas Tech Univ. (USA)

3:30 pm: **Intra-voxel analysis in MRI**, Fabio Baselice, Michele Ambrosanio, Giampaolo Ferraioli, Vito Pascazio, Univ. degli Studi di Napoli Parthenope (Italy) . . . . . .[9034-54]

3:50 pm: **A new application of compressive sensing in MRI**, Fabio Baselice, Giampaolo Ferraioli, Univ. degli Studi di Napoli Parthenope (Italy); Flavia Lenti, Univ. degli Studi dell'Insubria (Italy); Vito Pascazio, Univ. degli Studi di Napoli Parthenope (Italy) . . . . . .[9034-55]

4:10 pm: **Novel MRI-derived quantitative biomarker for cardiac function applied to classifying ischemic cardiomyopathy within a Bayesian rule learning framework**, Prahlad G. Menon, SYSU-CMU Joint Institute of Engineering (USA); Lailonny Morris, Carnegie Mellon Univ. (USA); Mara Staines, Univ. of Pittsburgh (USA); Joao Lima, The Johns Hopkins Hospital (USA); Daniel C. Lee, Northwestern Univ. (USA); Vanathi Gopalakrishnan, Univ. of Pittsburgh (USA) . . . . . .[9034-56]

4:30 pm: **Correction of dental artifacts within the anatomical surface in PET/MRI using active shape models and k-nearest-neighbors**, Claes N. Ladefoged, Rigshospitalet (Denmark) and Univ. of Copenhagen (Denmark); Flemming L. Andersen, Sune H. Keller, Rigshospitalet (Denmark); Thomas Beyer, Ctr. for Medical Physics and Biomedical Engineering (Austria); Liselotte Højgaard, Rigshospitalet (Denmark); François B. Lauze, Univ. of Copenhagen (Denmark) . . . . . .[9034-57]

Conference 9034 ENDS

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 4
Room: Golden West . . . . .Tue 3:30 to 4:50 pm

Vessels, Heart, and Eye I

Session Chairs: **Bram van Ginneken,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Thomas M. Deserno,** RWTH Aachen (Germany)

3:30 pm: **An image-based software tool for screening retinal fundus images using vascular morphology and network transport analysis**, Richard D. Clark III, Constellation Research, LLC (USA); Daniel J. Dickrell III, Univ. of Florida (USA); David L. Meadows, Constellation Research, LLC (USA) . . . . . .[9035-12]

3:50 pm: **An automatic machine learning system for coronary calcium scoring in clinical non-contrast enhanced, ECG-triggered cardiac CT**, Jelmer M. Wolterink, Tim Leiner, Richard A. P. Takx, Max A. Viergever, Ivana Isgum, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . .[9035-13]

4:10 pm: **Automated coronary artery calcification detection on low-dose chest CT images**, Yiting Xie, Cornell Univ. (USA); Matthew D. Cham, Claudia I. Henschke, David F. Yankelevitz, Icahn School of Medicine at Mount Sinai (USA); Anthony P. Reeves, Cornell Univ. (USA) . . . . . .[9035-14]

4:30 pm: **Supervised pixel classification for segmenting geographic atrophy in fundus autofluorescene images**, Zhihong Hu, Doheny Eye Institute (USA); Gerard G. Medioni, Matthias Hernandez, The Univ. of Southern California (USA); Sadda R. SriniVas, Doheny Eye Institute (USA) . . . . . .[9035-15]

WORKSHOP
Live Demonstrations
Grand Exhibit Hall · Tues. 5:00 to 7:00 pm
Workshop Chairs: **Stephen R. Aylward**, Ktiware Inc. (USA) and **Heang-Ping Chan**, Univ. of Michigan Health System (USA)
For details see page 15.

9035 continues on page 48

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 4
Room: California . . . . . .Tue 3:30 to 4:50 pm

Respiratory and Cardiac Motion Compensation

Session Chairs: **Wolfgang Birkfellner,** Medizinische Univ. Wien (Austria); **Jay B. West,** Accuray, Inc. (USA)

3:30 pm: **Optical surface scanning for respiratory motion monitoring in radiotherapy: a feasibility study**, Susanne L. Bekke, Univ. Hospital Herlev (Denmark) and Technical Univ. of Denmark (Denmark); Faisal Mahmood, Univ. Hospital Herlev (Denmark); Jakob Helt-Hansen, Technical Univ. of Denmark (Denmark); Claus F. Behrens, Univ. Hospital Herlev (Denmark) . . . . . .[9036-17]

3:50 pm: **Statistical analysis of surrogate signals to incorporate respiratory motion variability into radiotherapy treatment planning**, Matthias Wilms, Jan Ehrhardt, Univ. zu Lübeck (Germany); René Werner, Univ. Medical Ctr. Hamburg-Eppendorf (Germany); Mirko Marx, Heinz Handels, Univ. zu Lübeck (Germany) . . . . .[9036-18]

4:10 pm: **Marker-less respiratory motion modeling using the Microsoft Kinect for Windows**, Fatemeh Tahavori, Kevin Wells, Univ. of Surrey (UK) . . . . . .[9036-19]

4:30 pm: **Separating complex compound patient motion tracking data using independent component analysis**, Clifford Lindsay, Worcester Polytechnic Institute (USA); Karen Johnson, Michael A. King, Univ. of Massachusetts Medical School (USA). . . . . .[9036-20]

WORKSHOP
Commercialization of Medical Research
California · Tues. 5:00 to 7:00 pm
Workshop Chairs: **Guy Shechter**, Philips Healthcare (USA) and **Ziv R. Yaniv**, Children's National Medical Center (USA)
For details see page 15.

9036 continues on page 48

Conference 9038 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Royal Palm One

SESSION 11
Room: Royal Palm One . .Tue 3:30 to 4:50 pm

Breast

Session Chairs: **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA); **Armando Manduca,** Mayo Clinic College of Medicine (USA)

3:30 pm: **Method and device for intraoperative imaging of lumpectomy specimens to provide feedback to breast surgeon for prompt re-excision during the same procedure**, Andrzej Krol, Susan Hemingway, Kara Kort, Gustavo de la Rosa, Deepa Masrani, David H. Feiglin, SUNY Upstate Medical Univ. (USA); Avice O'Connell, Univ. of Rochester (USA); Mahesh B. Nagarajan, Chien-Chun Yang, Axel Wismüller, Univ. of Rochester Medical Ctr. (USA) . . . . . .[9038-51]

3:50 pm: **Ameliorating mammograms by using novel image processing algorithms**, Anup Pillai, David M. Kwartowitz, Clemson Univ. (USA)[9038-52]

4:10 pm: **Validation and reproducibility assessment of modality independent elastography in a pre-clinical model of breast cancer**, Jared A. Weis, Dong Kyu Kim, Thomas E. Yankeelov, Michael I. Miga, Vanderbilt Univ. (USA) . . .[9038-53]

4:30 pm: **Opto-acoustic breast imaging with co-registered ultrasound**, Jason Zalev, Bryan Clingman, Don Herzog, Tom Miller, Michael Ulissey, A. Thomas Stavros, Seno Medical Instruments, Inc. (USA); Alexander A. Oraevsky, TomoWave Laboratories, Inc. (USA); Kenneth Kist, N. Carol Dornbluth, Pamela Otto, The Univ. of Texas Health Science Ctr. at San Antonio (USA) . . . . . .[9038-54]

PLEASE NOTE:
SESSION 12 is on Wednesday

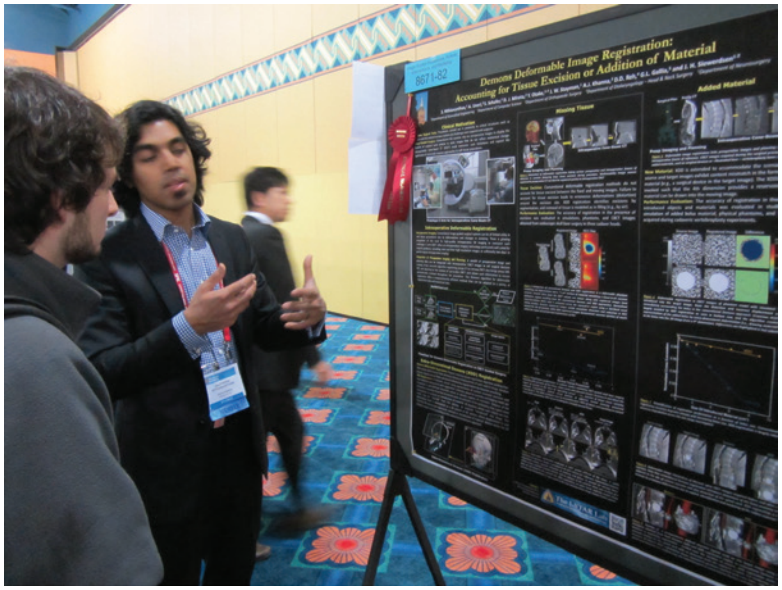
JOINT SESSION WITH CONFERENCE 9040
Room: San Diego . . . Wed 8:00 am to 9:40 am

Ultrasound Elastography
See page 48 Conf. 9040 Session 1 for times and presentations.

Conference 9038 ENDS

Participate in the Poster Sessions

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



Posters for this conference will be on display Tuesday and Wednesday. 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.

Poster Authors: Please put up your poster during the Tuesday morning coffee break. Posters will be available for viewing Tuesday and Wednesday. Stand with your poster during the poster session from 5:30 to 7:00 pm on Wednesday, and please remove it no later than 9:00 pm. Posters remaining on the boards after the extended viewing time on Wednesday will be discarded.

View Poster Guidelines for additional information:
http://spie.org/X30099.xml

Sunday/Monday Posters page 26.

Conference 9033 Posters
Physics of Medical Imaging

Algorithms and Applications

Investigation of the potential causes of partial scan artifacts in dynamic CT myocardial perfusion imaging, Yinghua Tao, Michael A. Speidel, Timothy P. Szczykutowicz, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . .[9033-81]

Quantification of microarchitectural anisotropy in bone with diffraction enhanced imaging, Dean M. Connor Jr., Meenal Mehrotra, Amanda C. LaRue, Medical Univ. of South Carolina (USA) . . . . .[9033-82]

Assessment of phase based dose modulation for improved dose efficiency in cardiac CT on an anthropomorphic motion phantom, Adam Budde, GE Healthcare (USA) and Univ. of Wisconsin-Madison (USA); Roy A. Nilsen, Brian E. Nett, GE Healthcare (USA) . . . . . .[9033-83]

Image registration for motion estimation in cardiac CT, Bibo Shi, Ohio Univ. (USA); Gene Katsevich, Princeton Univ. (USA); Beshan S. Chiang, Toshiba Medical Research Institute USA (USA); Alexander I. Katsevich, Univ. of Central Florida (USA); Alexander A. Zamyatin, Toshiba Medical Research Institute USA (USA) . . . . . .[9033-84]

A novel region of interest (ROI) imaging technique for biplane imaging in interventional suites: high-resolution small field-of-view imaging in the frontal plane and dose-reduced, large field-of-view standard-resolution imaging in the lateral plane, Swetadri Vasan Setlur Nagesh, Ciprian N. Ionita, Liza Pope, Albert H. Titus, Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) . . . . . .[9033-85]

Quantitative analysis of artifacts in 4D DSA: the relative contributions of beam hardening and scatter to vessel drop out behind highly attenuating structures, James R. Hermus, Timothy P. Szczykutowicz, Brian Davis, Erick L. Oberstarb, Martin Wagner, Charles M. Strother, Charles A. Mistretta, Univ. of Wisconsin-Madison (USA) . . . . . .[9033-86]

Calibration-free coronary artery measurements for interventional device sizing using inverse geometry X-ray fluoroscopy: in vivo validation, Michael T. Tomkowiak, Amish N. Raval, Michael S. Van Lysel, Univ. of Wisconsin-Madison (USA); Tobias Funk, Triple Ring Technologies, Inc. (USA); Michael A. Speidel, Univ. of Wisconsin-Madison (USA) . . . . . .[9033-87]

Necessary forward model specification accuracy for basis material decomposition in spectral CT, Hans Bornefalk, Mats Persson, Mats E. Danielsson, KTH Royal Institute of Technology (Sweden) . . . . . .[9033-88]

A study for the X-ray image quality improvement in the gastrointestinal examination and the examination of the respiratory system based on the new image processing technique, Yuichi Nagai, National Cancer Ctr. (Japan) and Hitachi Medical Corp. (Japan); Mayumi Kitagawa, Jyun Torii, Takumi Iwase, Kanyu Ihara, Tomohiko Asou, National Cancer Ctr. (Japan); Mari Fujikawa, Yumiko Takeuchi, Katsumi Suzuki, Takashi Isiguro, Akio Hara, Hitachi Medical Corp. (Japan) . . .[9033-90]

Relaxation times estimation in MRI, Fabio Baselice, Univ. degli Studi di Napoli Parthenope (Italy); Rocchina Caivano, Aldo Cammarota, IRCCS CROB (Italy); Giampaolo Ferraioli, Vito Pascazio, Univ. degli Studi di Napoli Parthenope (Italy) . . . . . .[9033-91]

Cone Beam CT

Comparison of the effect of simple and complex acquisition trajectories on the 2D and 3D SPRs for dedicated breast CT imaging, Jainil P. Shah, Steve D. Mann, Duke Univ. (USA); Randolph L. McKinley, ZumaTek, Inc. (USA); Martin P. Tornai, Duke Univ. (USA) . . . . . .[9033-92]

C-arm perfusion imaging with a fast penalized maximum-likelihood approach, Robert Frysch, Tim Pfeiffer, Sebastian Bannasch, Otto-von-Guericke-Univ. Magdeburg (Germany); Steffen Serowy, Univ. Medical Ctr. Magdeburg (Germany); Sebastian Gugel, Otto-von-Guericke-Univ Magdeburg (Germany); Martin Skalej, Univ. Medical Ctr. Magdeburg (Germany); Georg Rose, Otto-von-Guericke-Univ. Magdeburg (Germany). . . . . .[9033-93]

Simultaneous motion estimation and motion-compensated image reconstruction (SMEIR) for 4D Cone-beam CT, Jing Wang, Xuejun Gu, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA) . . . . . .[9033-94]

Three-dimensional image-guided extrapolation for cone-beam CT image reconstruction, Brian E. Nett, GE Healthcare (USA) . . . . . .[9033-95]

Anti-scatter grid evaluation for wide-cone CT, Roman Melnyk, John M. Boudry, GE Healthcare (USA); Xin Liu, Missouri Univ. of Science and Technology (USA); Mark Adamak, GE Healthcare (USA) . . . . . .[9033-96]

Variance-based iterative image reconstruction from few views in limited-angle C-arm computed tomography, Wissam El Hakimi, Technische Univ. Darmstadt (Germany); Georgios Sakas, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . . . . . .[9033-97]

An experimental study on the noise correlation properties of CBCT projection data, Hua Zhang, Southern Medical Univ. (China) and The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Luo Ouyang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Jianhua Ma, Wufan Chen, Southern Medical Univ. (China); Jing Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA) . . . . . .[9033-98]

A sinogram based technique for image correction and removal of metal clip artifacts in cone beam breast CT, Tianpeng Wang, Youtao Shen, Yuncheng Zhong, Chao-Jen Lai, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA) . . . . . .[9033-99]

Preliminary study of region-of-interest image reconstruction with intensity weighting in cone-beam CT using iterative algorithm, Kihong Son, KAIST (Korea, Republic of) and SAMSUNG Medical Ctr. (Korea, Republic of); Jiseoc Lee, Yunjeong Lee, KAIST (Korea, Republic of); Jin Sung Kim, SAMSUNG Medical Ctr. (Korea, Republic of); Seungryong Cho, KAIST (Korea, Republic of) . . . .[9033-100]

Toward improved cone-beam CT imaging of prostate patient via optimization-based image reconstruction, Xiao Han, The Univ. of Chicago Medical Ctr. (USA); Erik Pearson, The Univ. of Chicago (USA); Emil Y. Sidky, The Univ. of Chicago Medical Ctr. (USA); Charles A. Pelizzari, The Univ. of Chicago (USA); Xiaochuan Pan, The Univ. of Chicago Medical Ctr. (USA) . . . .[9033-101]

Conventional CT

Reduction of metal artifacts: beam hardening and photon starvation effects, Girijesh Yadava, Debashish Pal, Jiang Hsieh, GE Healthcare (USA). . . . . .[9033-102]

Acquiring tomographic images from panoramic X-ray scanners, Van-Giang Nguyen, Le Quy Don Technical Univ. (Viet Nam); Soo-Jin Lee, Paichai Univ. (Korea, Republic of). . . . . .[9033-103]

Impact of redundant ray weighting on motion artifact in a statistical iterative reconstruction framework, Yinghua Tao, Jie Tang, Michael A. Speidel, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . [9033-104]

Effective noise and streak reduction method by projection domain processing, Zhi Yang, Alexander A. Zamyatin, Satoru Nakanishi, Toshiba Medical Research Institute USA (USA) . . . . . [9033-105]

X-ray pulsing methods for reduced-dose computed tomography in PET/CT attenuation correction, Uwe Wiedmann, V. B. Neculaes, Daniel D. Harrison, Evren Asma, GE Global Research (USA); Paul E. Kinahan, Univ. of Washington (USA); Bruno De Man, GE Global Research (USA) . . . . . [9033-106]

Dose, noise and view weights in CT helical scans, Guangzhi Cao, Edgar Chino, Roy A. Nilsen, Jiang Hsieh, GE Healthcare (USA) . . . . . [9033-107]

Volume estimation of multi-density nodules with thoracic CT, Marios A. Gavrielides, Qin Li, Rongping Zeng, Kyle J. Myers, Berkman Sahiner, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9033-108]

CT Reconstruction

Accelerating ordered-subsets X-ray CT image reconstruction using the linearized augmented Lagrangian framework, Hung Nien, Jeffrey A. Fessler, Univ. of Michigan (USA) . . . . . [9033-109]

Sinogram rebinning and frequency boosting for high resolution iterative CT reconstruction with focal spot wobbling, Jiao Wang, Yong Long, Lin Fu, Xue Rui, Bruno De Man, GE Global Research (USA) . . . . . [9033-110]

A multi-resolution approach to retrospectively-gated cardiac micro-CT reconstruction, Darin P. Clark, G. Allan Johnson, Cristian T. Badea, Ctr. for In Vivo Microscopy (USA) and Duke Univ. (USA) . . . . . [9033-111]

Generalized least-squares CT reconstruction with detector blur and correlated noise models, Joseph W. Stayman, Wojciech Zbijewski, Steven Tilley II, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9033-112]

LBP-based penalized weighted least-squares approach to low-dose cone-beam computed tomography reconstruction, Ming Ma, Huafeng Wang, Yan Liu, Hao Zhang, Stony Brook Univ. (USA); Xianfeng Gu, Stony Brook University (USA); Zhengrong Liang, Stony Brook Univ. (USA) . . . . . [9033-113]

Nonlocal means-based regularizations for statistical CT reconstruction, Hao Zhang, Stony Brook Univ. (USA); Jianhua Ma, Southern Medical University (China); Yan Liu, Hao Han, Stony Brook Univ. (USA); Lihong Li, City University of New York/CSI (USA); Jing Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Zhengrong Liang, Stony Brook Univ. (USA) . . . [9033-114]

Low-dose CT reconstruction with patch based sparsity and similarity constraints, Qiong Xu, Xuanqin Mou, Xi'an Jiaotong Univ. (China). . . . . [9033-115]

Noise study on cone-beam CT FDK image reconstruction by improved area-simulating-volume technique, Yan Liu, Stony Brook Univ. (USA); Jin Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Hao Zhang, Yi Fan, Zhengrong Liang, Stony Brook Univ. (USA). . [9033-116]

Mojette tomographic reconstruction for micro CT: a bone and vessels quality evaluation, Henri Der Sarkissian, LUNAM - Univ. de Nantes (France) and KEOSYS (France); Benoit Recur, Australian National Univ. (Australia) and Univ. de Nantes (Australia); Jean-Pierre V. Guédon, Pauline Bléry, LUNAM - Univ. de Nantes (France); Yves Amouriq, LUNAM - Univ de Nantes (France) . . . . . [9033-117]

Two-step iterative reconstruction of region-of-interest with truncated projection in computed tomography, Keisuke Yamakawa, Shinichi Kojima, Hitachi, Ltd. (Japan) . . . . . [9033-118]

Multigrid iterative method with adaptive spatial support for computed tomography reconstruction from few-view data, Ping-Chang Lee, Industrial Technology Research Institute (Taiwan) . . . . . [9033-119]

Iterative raw measurements restoration method with penalized weighted least squares approach for low-dose CT, Hisashi Takahashi, Taiga Goto, Koichi Hirokawa, Osamu Miyazaki, Hitachi Medical Corp. (Japan) . . . . . [9033-120]

Multi-energy CT

Use of depth information from in-depth photon counting detectors for x-ray spectral imaging: a preliminary simulation study, Yuan Yao, Stanford Univ. (USA); Hans Bornefalk, KTH Royal Institute of Technology (Sweden); Scott S. Hsieh, Stanford Univ. (USA); Mats E. Danielsson, KTH Royal Institute of Technology (Sweden); Norbert J. Pelc, Stanford Univ. (USA). . . . . [9033-121]

Fast model-based restoration of noisy and undersampled spectral CT data, David S. Rigie, Patrick J. La Rivière, The Univ. of Chicago (USA) . . . . . [9033-122]

Experimental study of two material decomposition methods using multi-bin photon counting detectors, Kevin C. Zimmerman, Marquette Univ. (USA); Emil Y. Sidky, The Univ. of Chicago Medical Ctr. (USA); Taly Gilat Schmidt, Marquette Univ. (USA) . . . . . [9033-123]

Prostate tissue decomposition via DECT using the model based iterative image reconstruction algorithm DIRA, Alexandr Malusek, Michael Sandborg, Gudrun Alm Carlsson, Maria Magnusson, Robin Westin, Linköping Univ. (Sweden) . . . . . [9033-124]

Investigation of the polynomial approach for material decomposition in spectral X-ray tomography using an energy-resolved detector, Alexandra Potop, Véronique Rebuffel, Jean Rinkel, Andrea Brambilla, CEA-LETI-Minatec (France); Françoise Peyrin, CREATIS-LRMN INSA (France); Loick Verger, CEA-LETI-Minatec (France) . . . . . [9033-125]

Enabling photon counting detectors with dynamic attenuators, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . . [9033-126]

Noise balance in pre-reconstruction decomposition in spectral CT, Xiaolan Wang, Yu Zou, Toshiba Medical Research Institute USA (USA). . . . . [9033-127]

Energy-resolved CT imaging with a photon counting silicon strip detector, Mats Persson, Ben Huber, Staffan Karlsson, Xuejin Liu, Han Chen, Cheng Xu, Moa M. Yveborg, Hans Bornefalk, Mats E. Danielsson, KTH Royal Institute of Technology (Sweden) . . . . . [9033-128]

Detectors

Characterization of a hybrid energy-resolving photon-counting detector, Andrea Zang, Georg Pelzer, Gisela Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rafael Ballabriga Sune, CERN (Switzerland); Francesca Bisello, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and IBA Dosimetry GmbH (Germany); Michael Campbell, Xavier Llopart, CERN (Switzerland); Ina Ritter, Felix Tennert, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Stefan Wölfel, IBA Dosimetry GmbH (Germany); Winnie S. Wong, CERN (Switzerland); Thilo Michel, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . [9033-129]

X-ray light valve (XLV): a novel detectors' technology for digital mammography, Sorin Marcovici, Vladimir N. Sukhovatkin, Peter Oakham, XLV Diagnostics, Inc. (Canada) . . . . . [9033-130]

Characterization of a silicon strip detector for photon-counting spectral CT using monoenergetic photons from 40 keV to 120 keV, Xuejin Liu, Hans Bornefalk, Han Chen, Mats E. Danielsson, Staffan Karlsson, Mats Persson, Cheng Xu, Ben Huber, KTH Royal Institute of Technology (Sweden) . . . . . [9033-131]

Experimental and theoretical performance analysis for a CMOS-based high resolution image detector, Amit Jain, Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) . . . . . [9033-132]

Measurement of imaging properties of scintillating fiber optic plate, George Zentai, Arundhuti Ganguly, Josh M. Star-Lack, Gary F. Virshup, Daniel Shedlock, Dave Humber, Varian Medical Systems, Inc. (USA) . . . . . [9033-133]

Optimizing two radioluminescence based quality assurance devices for diagnostic radiology utilizing a simple model, Jan P. Lindström, Karolinska Univ. Hospital (Sweden) and Linköping Univ. (Sweden) and Radicon, Bromma (Sweden); Markus Hulthén, Karolinska Univ. Hospital (Sweden); Gudrun Alm-Carlsson, Michael Sandborg, Linköping Univ. (Sweden) . . . . . [9033-134]

Investigation of spatial resolution and temporal performance of SAPHIRE (scintillator avalanche photoconductor with high resolution emitter readout) with integrated electrostatic focusing, David A. Scaduto, Anthony R. Lubinsky, John A. Rowlands, Wei Zhao, Stony Brook Univ. (USA); Hidenori Kenmotsu, Norihito Nishimoto, Takeshi Nishino, NANOX Japan (Japan); Kenkichi Tanioka, Tokyo Denki Univ. (Japan) . . . . . [9033-135]

Imaging performance of a thin Lu_2O_3:Eu nanophosphor scintillating screen coupled to a high resolution CMOS sensor under X-ray radiographic conditions: comparison with Gd_2O_2S:Eu conventional phosphor screen, Ioannis E. Seferis, Univ. of Patras (Greece); C. M. Michail, I. G. Valais, Technological Educational Institute of Athens (Greece); Justyna Zeler, Univeristy of Wroclaw (Poland); Panagiotis F. Liaparinos, Nektarios I. Kalyvas, G. P. Fountos, Technological Educational Institute of Athens (Greece); Eugeniusz Zych, Univ. of Wroclaw (Poland); I. S. Kandarakis, Technological Educational Institute of Athens (Greece); George Panayiotakis, Univ. of Patras (Greece) . . . . . [9033-136]

Physical properties of a new flat panel detector with irradiated side sampling (ISS) technology, Martin Fiebich, Jan M. Burg, Christina Piel, Technische Hochschule Mittelhessen (Germany); Laura Rodenheber, Justus-Liebig-Univ. Giessen (Germany); Petar Penchev, Technische Hochschule Mittelhessen (Germany); Gabriele A. Krombach, Justus-Liebig-Univ. Giessen (Germany) . . . . . [9033-137]

MTF characterization in 2D and 3D for a high resolution, large field of view flat panel imager for cone beam CT, Jainil P. Shah, Steve D. Mann, Martin P. Tornai, Duke Univ. (USA); Michelle Richmond, George Zentai, Varian Medical Systems, Inc. (USA) . . . . . [9033-138]

Comparing analytical and Monte Carlo optical diffusion models in phosphor-based X-ray detectors, Nektarios I. Kalyvas, Panagiotis F. Liaparinos, Technological Educational Institute of Athens (Greece) . . . . . [9033-139]

X-ray imaging performance of an intra-oral X-ray detector featuring a structured scintillator, Uwe Zeller, Suni Medical Imaging, Inc. (USA); Olof Svenonius, Scint-X AB (Sweden); Dan Brüllmann, Univ. Augenklinik Mainz (Germany); Buon Nguyen, Suni Medical Imaging, Inc. (USA); Anna Sahlholm, Fredrik Jonsson, Scint-X AB (Sweden). . . . . [9033-141]

Dose

Radio-fluorogenic dosimetry with violet diode lasers, Peter A. Sandwall, Precision Physics, Inc. (USA) . . . . . [9033-142]

Comparison of different approaches of estimating effective dose from reported exposure data in 3D imaging with interventional fluoroscopy systems, Angelica Svalkvist, Jonny Hansson, Magnus Båth, Sahlgrenska Univ. Hospital (Sweden) . . . . . [9033-143]

Improved-resolution real-time skin-dose mapping for interventional fluoroscopic procedures, Vijay K. Rana, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) and Toshiba Stroke and Vascular Research Ctr. (USA) . . [9033-144]

Beam hardening and partial beam hardening of the bowtie filter: effects on dosimetric applications in CT, Xochitl Lopez Rendon, Katholieke Univ. Leuven (Belgium); Guozhi Zhang, Mayo Clinic (USA); Hilde Bosmans, Raymond Oyen, Federica Zanca, Katholieke Univ. Leuven (Belgium) . . . . . [9033-145]

Brachytherapy for prostate cancer under computed tomography control: reduction of the effective dose of X-rays, Dmitriy Sanin, Vitaliy Birukov, Sergey Rusetskiy, Medical Radiological Research Ctr. (Russian Federation); Pavel Sviridov, Tatiana Volodina, Ctr. of Brachytherapy of Prostate Cancer (Russian Federation) . . . . . [9033-146]

Mammography

X-ray scatter characterization in dedicated breast CT with bowtie filters, Kimberly Kontson, Robert J. Jennings, Univ. of Maryland (USA) and U.S. Food and Drug Administration, Ctr. for Devices and Radiological Health (USA) . . . . . [9033-147]

A simple scatter correction method for dual energy contrast-enhanced digital breast tomosynthesis, Yihuan Lu, Beverly A. Lau, Yue-Houng Hu, Wei Zhao, Gene Gindi, Stony Brook Univ. (USA) . [9033-148]

Development of mammography system using CdTe photon counting detector for the exposure dose reduction, Sho Maruyama, Naoko Niwa, Misaki Yamazaki, Nagoya Univ. Graduate School of Medicine (Japan); Tatsuya Nagano, Telesystems Co., Ltd. (Japan); Yoshie Kodera, Nagoya Univ. Graduate School of Medicine (Japan). . . . . [9033-149]

On imaging with or without grid in digital mammography, Han Chen, Mats E. Danielsson, Björn Cederström, KTH Royal Institute of Technology (Sweden)[9033-150]

Estimation of effective X-ray tissue attenuation differences for volumetric breast density measurement, Biao Chen, Chris Ruth, Zhenxue Jing, Baorui Ren, Andrew P. Smith, Ashwini Kshirsagar, Hologic, Inc. (USA) . . . . . [9033-151]

Improving the spatial resolution characteristics of dedicated cone-beam breast CT technology, Peymon Gazi, Kai Yang, George Burkett, John M. Boone, UC Davis Medical Ctr. (USA) . . . . . [9033-152]

Spectra optimization for computed radiography systems, Johann B. Hummel, Friedrich Semturs, Marcus Kaar, Peter Homolka, Michael Figl, Medizinische Univ. Wien (Austria). . . . . [9033-153]

New Imaging Concepts

Feasibility study of spectral computed tomography (CT) with gold as a new contrast agent, Marie Müllner, Helmut Schlattl, Uwe Oeh, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany); Olaf Dietrich, Ludwig-Maximilians-University Hospital Munich (Germany) . . . . . [9033-155]

Projection-based energy weighting on photon-counting X-ray images in digital subtraction mammography: a feasibility study, Sung-Hoon Choi, Hee-Joung Kim, Seung-Wan Lee, Yu-Na Choi, Young-Jin Lee, Yonsei Univ. (Korea, Republic of). . [9033-156]

High resolution X-ray fluorescence imaging for a microbeam radiation therapy treatment planning system, Pavel A. Chtcheprov, Christina R. Inscoe, Laurel Burk, Rachel Ger, Hong Yuan, The Univ. of North Carolina at Chapel Hill (USA); Sha Chang, Univ. of North Carolina at Chapel Hill (USA); Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . . [9033-157]

Development of an MRI fiducial marker prototype for automated MR-US fusion of abdominal images, Christopher P. Favazza, Krzysztof R. Gorny, Mayo Clinic (USA); Michael J. Washburn, GE Healthcare (USA); Nicholas J. Hangiandreou, Mayo Clinic (USA) . . . . . [9033-158]

Comparison between optimized GRE and RARE sequences for 19F MRI studies, Chiara D. Soffientini, Politecnico di Milano (Italy); Alfonso Mastropietro, Fondazione I.R.C.C.S. Istituto Neurologico Carlo Besta (Italy) and Politecnico di Milano (Italy); Matteo Caffini, Sara Cocco, Politecnico di Milano (Italy); Ileana Zucca, Alessandro Scotti, Fondazione I.R.C.C.S. Istituto Neurologico Carlo Besta (Italy); Giuseppe Baselli, Politecnico di Milano (Italy) . . . . . [9033-159]

Noise effects in multi-peak multi-echo chemical shift-based water-fat quantification, Giulio Siracusano, Michele Gaeta, Univ. degli Studi di Messina (Italy); Aurelio La Corte, Univ. degli Studi di Catania (Italy); Carmelo Milazzo, Demetrio Milardi, Univ. degli Studi di Messina (Italy); Placido Bramanti, IRCCS Ctr. Studi Neurolesi Bonino Pulejo (Italy); Giuseppe Pio Anastasi, Giovanni Finocchio, Univ. degli Studi di Messina (Italy) . . . [9033-160]

A new resonance-frequency based electrical impedance spectroscopy and its application in biomedical engineering, Sreeram Dhurjaty, Dhurjaty Electronics Consulting LLC (USA); Maxine Tan, Bin Zheng, The Univ. of Oklahoma (USA) . . . . . [9033-161]

Nuclear Medical Imaging

A simple model for deep tissue attenuation correction and large organ analysis of Cerenkov luminescence imaging, Frezghi Habte, Stanford Univ. (USA); Arutselvan Natarajan, UC Davis Cancer Ctr. (USA); Sanjiv S. Gambhir, Stanford Univ. (USA); Timothy C. Doyle, Stanford Univ. School of Medicine (USA) . . . . . [9033-164]

Improved attenuation correction for freely moving animal brain PET studies using a virtual scanner geometry, Georgios I. Angelis, Brain & Mind Research Institute (Australia); William J. Ryder, Andre Z. Kyme, Roger R. Fulton, Steven R. Meikle, Brain & Mind Research Institute (Australia) and The Univ. of Sydney (Australia) . . . . . [9033-165]

Optimization using detective quantum efficiency (DQE) of the high-resolution parallel-hole collimators with CdTe pixelated semiconductor SPECT system, Young-Jin Lee, Dae-Hong Kim, Ye-Seul Kim, Hee-Joung Kim, Yonsei Univ. (Korea, Republic of) . . . . . [9033-166]

A novel intra-operative positron imager for rapid localization of tumor margins, Hamid Sabet, Radiation Monitoring Devices, Inc. (USA); Brendan Stack Jr., Univ. of Arkansas for Medical Sciences (USA); Vivek V. Nagarkar, Radiation Monitoring Devices, Inc. (USA) . [9033-167]

Preliminary Monte Carlo simulation of developments of Zr-89 PET imaging protocols, Khalid S. Alzimami, King Saud Univ. (Saudi Arabia); Salem A. Sassi, Riyadh Military Hospital (Saudi Arabia); Nicholas M. Spyrou, Univ. of Surrey (UK) . . . . . [9033-168]

Image reconstruction for the new simultaneous whole-body OpenPET/CT geometry, Yannan Yin, Tokyo Institute of Technology (Japan); Hideaki Tashima, National Institute of Radiological Sciences (Japan); Takashi Obi, Tokyo Institute of Technology (Japan); Taiga Yamaya, National Institute of Radiological Sciences (Japan). . . . . [9033-169]

Phantoms and Radiation Transport

Including the effect of molecular interference in the coherent x-ray scattering modeling in MC-GPU and PENELOPE for the study of novel breast imaging modalities, Bahaa Ghammraoui, Rui Peng, Ivan Suarez, Cecilia Bettolo, Andreu Badal, U.S. Food and Drug Administration (USA) . . . . . [9033-170]

Evaluation of the resolving potency of a novel reconstruction filter on periodontal ligament space with dental cone-beam CT: a quantitative phantom study, Yuuki Houno, Nagoya Univ. Graduate School of Medicine (Japan); Toshimitsu Hishikawa, Ken-ichi Gotoh, Munetaka Naitoh, Eiichiro Ariji, Aichi Gakuin Univ. (Japan); Yoshie Kodera, Nagoya Univ. Graduate School of Medicine (Japan). . . . . [9033-171]

Unfiltered Monte Carlo-based tungsten anode spectral model from 20 kV to 640 kV, Andrew M. Hernandez, Univ. of California, Davis (USA); John M. Boone, UC Davis Medical Ctr. (USA) . . . . . [9033-172]

3D X-ray reconstruction using lightfield imaging, Murat Tahtali, Sajib K. Saha, Andrew J. Lambert, Mark R. Pickering, UNSW@ADFA (Australia) . . . . . [9033-173]

Hybrid model for computed tomography simulations and post-patient collimator design, Horace Xu, Kun Tao, GE Global Research (China); Padmashree GK, GE Healthcare (India); Mingye Wu, GE Global Research (China); Ximiao Cao, GE Healthcare (China); Yong Long, GE Global Research (USA); Ming Yan, Yangyang Yao, GE Global Research (China); Bruno DeMan, GE Global Research (USA). . . . . [9033-174]

Physics-based modeling of X-Ray CT measurements with energy-integrating detectors, Yong Long, Hewei Gao, GE Global Research (USA); Mingye Wu, GE Global Research (China); Jed D. Pack, GE Global Research (USA); Horace Xu, Kun Tao, GE Global Research (China); Paul F. Fitzgerald, Bruno De Man, GE Global Research (USA) . . . . . [9033-175]

Quantification of biological tissue and construction of patient equivalent phantom (skull and chest) for infants (1-5 years old), Allan F. F. Alves, Diana R. Pina, José Ricardo A. Miranda, Fernando Antonio Bacchim Neto, Sergio Marrone Ribeiro, Univ. Estadual Paulista (Brazil) . . . . . [9033-176]

Guidewire path simulation using equilibrium of forces, Fernando M. Cardoso, Sergio S. Furuie, Escola Politécnica da Univ. de São Paulo (Brazil) . . . . . [9033-177]

Optical crosstalk in CT detectors and its effects on CT images, Hanbean Youn, Soohwa Kam, Jong Chul Han, Ho Kyung Kim, Pusan National Univ. (Korea, Republic of) . . . . . [9033-178]

A comparison of simulation tools for photon-counting spectral CT, Radin A. Nasirudin, Technische Univ. München (Germany); Petar Penchev, Technische Hochschule Mittelhessen (Germany) and Institut für Medizinische Physik und Strahlenschutz (Germany); Kai Mei, Ernst J. Rummeny, Technische Univ. München (Germany); Martin Fiebich, Technische Hochschule Mittelhessen (Germany) and Institut für Medizinische Physik und Strahlenschutz (Germany); Peter B. Noël, Technische Univ. München (Germany) . . . . . [9033-179]

Phase Contrast Imaging

Optimization of grating-based phase-contrast imaging setup, Pavlo Baturin, Mark E. Shafer, Carestream Health, Inc. (USA) . . . . . [9033-180]

Design of a compact high-energy setup for x-ray phase-contrast imaging, Markus Schüttler, Technische Univ. München (Germany) and Karlsruhe Institute of Technology (Germany); Andre Yaroshenko, Technische Univ. München (Germany); Martin Bech, Technische Univ. München (Germany) and Medical Radiation Physics (Sweden); Guillaume Potdevin, Andreas Malecki, Michael Chabior, Johannes Wolf, Arne Tapfer, Technische Univ. München (Germany); Jan Meiser, Danays Kunka, Maximilian Amberger, Jürgen Mohr, Karlsruher Institut für Technologie (Germany); Franz Pfeiffer, Technische Univ. München (Germany) . . . . . [9033-181]

Fabrication of multilayer coated gratings for phase-contrast computed tomography (CT), Zsolt Marton, Harish B. Bhandari, Vivek V. Nagarkar, Radiation Monitoring Devices, Inc. (USA); Harold H. Wen, National Heart, Lung, and Blood Institute (USA) . . . . . [9033-182]

In-line phase-contrast X-ray imaging with dual-energy, Hui-Hsin Lu, Jiun-Lin Kuo, Shih-Chung Lee, Wei-Hsin Wang, Yio-Wha Shau, Industrial Technology Research Institute (Taiwan). . . . . [9033-183]

Analysis and optimization of a deconvolution-based information retrieval algorithm in X-Ray grating-based phase-contrast imaging, Florian Horn, Florian L. Bayer, Florian Gräf, Christoph Hertle, Georg Pelzer, Jens Rieger, André Ritter, Thomas Weber, Andrea Zang, Thilo Michel, Gisela Anton, Erlangen Ctr. for Astroparticle Physics (Germany) . . . . . [9033-184]

Energy weighting in grating-based X-ray phase-contrast imaging, Georg Pelzer, Thomas Weber, Gisela Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Rafael Ballabriga Sune, CERN (Switzerland); Florian L. Bayer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Michael Campbell, CERN (Switzerland); Thomas Gabor, Wilhelm Haas, Florian Horn, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Xavi Llopart Cudie, CERN (Switzerland); Norbert Michel, CMS-Schnaittach (Germany); Uwe Mollenbauer, IBA Dosimetry GmbH (Germany); Jens Rieger, André Ritter, Ina Ritter, Peter Sievers, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Stefan Woelfel, IBA Dosimetry GmbH (Germany); Winnie S. Wong, CERN (Switzerland); Andrea Zang, Thilo Michel, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . .[9033-185]

Comparison of propagation- and grating-based X-ray phase-contrast imaging techniques with a liquid-metal-jet source, Tunhe Zhou, Ulf Lundström, KTH Royal Institute of Technology (Sweden); Thomas Thüring, Simon Rutishauser, Paul Scherrer Institut (Switzerland) and Swiss Federal Institute of Technology (Switzerland); Daniel H. Larsson, KTH Royal Institute of Technology (Sweden); Marco F. M. Stampanoni, Paul Scherrer Institut (Switzerland) and Swiss Federal Institute of Technology (Switzerland); Christian David, Paul Scherrer Institut (Switzerland); Hans M. Hertz, Anna Burvall, KTH Royal Institute of Technology (Sweden) . . . . . .[9033-186]

Performance and optimization of X-ray grating interferometry, Matteo Abis, Thomas Thüring, Marco F. M. Stampanoni, Paul Scherrer Institut (Switzerland)[9033-187]

Increasing the field of view of X-ray phase contrast imaging using stitched gratings on low absorbent carriers, Jan Meiser, Maximilian Amberger, Karlsruher Institut für Technologie (Germany); Marian Willner, Technische Univ. München (Germany); Danays Kunka, Pascal Meyer, Karlsruher Institut für Technologie (Germany); Frieder Koch, Karlsruher Institut für Technologie (Germany); Alexander Hipp, Helmholtz-Zentrum Geesthacht (Germany); Marco Walter, microworks GmbH (Germany); Franz Pfeiffer, Technische Univ. München (Germany); Jürgen Mohr, Karlsruher Institut für Technologie (Germany). . . . . .[9033-188]

Grating-based mammography X-ray system, Jens Rieger, Florian L. Bayer, Florian Horn, Thilo Michel, Georg Pelzer, André Ritter, Thomas Weber, Gisela Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany). . . . . .[9033-189]

Effect of coherence loss in differential phase contrast cone beam CT, Weixing Cai, Ruola Ning, Jiangkun Liu, Univ. of Rochester Medical Ctr. (USA) . .[9033-191]

Modulation transfer function analysis in X-ray grating interferometry using wave-optical simulations, Johannes Wolf, Michael Chabior, Technische Univ. München (Germany); Jonathan I. Sperl, GE Global Research Europe (Germany); Andreas Malecki, Technische Univ. München (Germany); Dirk Bequé, Cristina Cozzini, GE Global Research Europe (Germany); Franz Pfeiffer, Technische Univ. München (Germany) . . . . . .[9033-192]

Reconstruction

Pre-computed backprojection based penalized-likelihood (PPL) reconstruction with an edge-preserved regularizer with stationary digital breast tomosynthesis (sDBT), Shiyu Xu, Southern Illinois Univ. Carbondale (USA); Christina R. Inscoe, Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA); Ying Chen, Southern Illinois Univ. Carbondale (USA) .[9033-194]

Digital breast tomosynthesis reconstruction with an adaptive voxel grid, Bernhard E. H. Claus, GE Global Research (USA); Heang-Ping Chan, Univ. of Michigan (USA). . . . . .[9033-195]

List-mode PET image reconstruction for motion correction using the Intel XEON PHI co-processor, William J. Ryder, Georgios I. Angelis, Rezaul Bashar, John E. Gillam, Roger R. Fulton, Steven R. Meikle, The Univ. of Sydney (Australia) .[9033-196]

Factor-scaled optimization transfer based iterative reconstruction with stationary digital breast tomosynthesis (sDBT), Shiyu Xu, Southern Illinois Univ. Carbondale (USA); Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA); Ying Chen, Southern Illinois Univ. Carbondale (USA). . . . . .[9033-197]

Iterative reconstruction of volumetric modulated arc radiotherapy plans using control point basis vectors, Joseph C. Barbiere, Alexander Kapulsky, Alois Ndlovu, Hackensack Univ. Medical Ctr. (USA) . . . . . .[9033-198]

Investigation of the quantitative accuracy of 3D iterative reconstruction algorithms in comparison to filtered back projection methods: a phantom study, Nouf H. Abuhadi, David Bradley, Zsolt Podolyak, Univ. of Surrey (UK); Salem A. Sassi, Prince Sultan Medical Military City (Saudi Arabia) . . . . . .[9033-199]

System Characterization

Focal spot measurements using a digital flat panel detector, Amit Jain, Toshiba Stroke and Vascular Research Ctr. (USA); Ashish S. Panse, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) . .[9033-200]

Dose reduction in CT with correlated-polarity noise reduction: context-dependent spatial resolution and noise properties demonstrating two-fold dose reduction with minimal artifacts, James T. Dobbins III, Jered R. Wells, William P. Segars, Duke Univ. (USA). . . . . .[9033-201]

Validation of an image-based technique to assess the perceptual quality of clinical chest radiographs with an observer study, Yuan Lin, Kingshuk R. Choudhury, H. Page McAdams, Duke Univ. Medical Ctr. (USA); David H. Foos, Carestream Health, Inc. (USA); Ehsan Samei, Duke Univ. Medical Ctr. (USA) . . . . . .[9033-202]

Relative object detectability (ROD): a new metric for comparing X-ray image detector performance for a specified object of interest, Vivek Singh, Amit Jain, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) . . . . . .[9033-203]

Experimental characterization of the noise performance of statistical model based iterative reconstruction (MBIR) in a clinical CT system, Ke Li, Jie Tang, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . . .[9033-204]

Comparison of deconvolution techniques to measure directional MTF of FDK reconstruction, Changwoo Lee, Junhan Park, Youngjun Ko, Jongduk Baek, Yonsei Univ. (Korea, Republic of)[9033-205]

System Reports

Detector and imaging performance of a pre-clinical spectral CT system using CZT detectors bonded to Medipix3RX, Alexander Cherlin, Ian Radley, Kromek (UK); Philip H. Butler, MARS Bioimaging Ltd. (New Zealand) and Univ. of Canterbury (New Zealand) and CERN (Switzerland); Anthony P. H. Butler, MARS Bioimaging Ltd. (New Zealand) and Univ. of Otago (New Zealand) and CERN (Switzerland); Stephen T. Bell, MARS Bioimaging Ltd. (New Zealand); Marcus Clyne, ILR (New Zealand); Michael Prokesch, Handong Li, eV Products (USA) . . . . . .[9033-206]

A spectral CT technique using balanced K-edge filter set, Yothin Rakvongthai, Massachusetts General Hospital (USA); William Worstell, Photo Diagnostic Systems Inc. (USA) and Massachusetts General Hospital (USA); Georges El Fakhri, Jinsong Ouyang, Massachusetts General Hospital (USA) . . . . . .[9033-207]

A flat-field correction method for photon-counting-detector-based micro-CT, So E. Park, Jae G. Kim, Mohammed A. A. Hegazy, Min H. Cho, Soo Yeol Lee, Kyung Hee Univ. (Korea, Republic of) . . . . . .[9033-208]

Initial development of a nested SPECT-CT system with fully suspended CT sub-system for dedicated breast imaging, Jainil P. Shah, Steve D. Mann, Duke Univ. (USA); Randolph L. McKinley, ZumaTek, Inc. (USA); Martin P. Tornai, Duke Univ. (USA) . . . . . .[9033-209]

Phase contrast portal imaging for image-guided microbeam radiation therapy, Keiji Umetani, Japan Synchrotron Radiation Research Institute (Japan); Takeshi Kondoh, Kobe Univ. (Japan). . . . . .[9033-210]

Stationary and non-stationary multi-beamline architecture study for cardiac CT imaging, Jiao Wang, Paul F. Fitzgerald, Hewei Gao, Yannan Jin, GE Global Research (USA); Ge Wang, Rensselaer Polytechnic Institute (USA); Bruno De Man, GE Global Research (USA). . . . . [9033-211]

Determination of minor and trace elements in kidney stones by X-ray fluorescence analysis, Anjali Srivastava, Brianne J. Heisinger, Vaibhav Sinha, Hyong Koo Lee, Xin Liu, Missouri Univ. of Science and Technology (USA); Mingliang Qu, Xinhui Duan, Shuai Leng, Cynthia H. McCollough, Mayo Clinic (USA). [9033-212]

Workflow for the use of a high-resolution image detector in endovascular interventional procedures, Raman Rana, Brendan M. Loughran, Swetadri Vasan Setlur Nagesh, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Liza Pope, TSVRC, University at Buffalo (USA); Ciprian N. Ionita, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA); Adnan Siddiqui, Ning Lin, TSVRC, University at Buffalo (USA); Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) and Univ. at Buffalo (USA) . . . . .[9033-213]

Tomosynthesis and Multi-energy Imaging

Feasibility of active sandwich detectors for single-shot dual-energy imaging, Seungman Yun, Jong Chul Han, Dong Woon Kim, Hanbean Youn, Ho Kyung Kim, Pusan National Univ. (Korea, Republic of); Jesse Tanguay, Ian A. Cunningham, Robarts Research Institute (Canada) . . . . . .[9033-214]

Scatter correction method with primary modulator for dual energy digital radiography: a preliminary study, Byung-Du Jo, Hee-Joung Kim, Dae-Hong Kim, Young-Jin Lee, Pil-Hyun Jeon, Yonsei Univ. (Korea, Republic of). . . . . .[9033-215]

Assessing and improving cobalt-60 digital tomosynthesis image quality, Matthew B. Marsh, Kingston Regional Cancer Ctr. (Canada); L. John Schreiner, Cancer Ctr. of Southeastern Ontario (Canada); Andrew Kerr, Kingston Regional Cancer Ctr. (Canada) . . . . . .[9033-216]

2D and 3D registration methods for dual-energy contrast-enhanced digital breast tomosynthesis, Kristen C. Lau, Susan Roth, Andrew D. A. Maidment, Univ. of Pennsylvania (USA) . . . . . .[9033-217]

Optimization of exposure parameters based on the polychromatic cascaded model of X-ray detectors, Kwang Eun Jang, Jongha Lee, Younghun Sung, SeungDeok Lee, Samsung Advanced Institute of Technology (Korea, Republic of). . . . . .[9033-218]

X-ray Imaging

A vacuum sealed miniature x-ray tube based on carbon nanotube emitters for intraoral x-ray image, Hyun Jin Kim, Jun Mok Ha, Hamid Saeed Raza, Sung Oh Cho, KAIST (Korea, Republic of) . . . .[9033-219]

Transmission x-ray characteristics of an ultrananocrystalline diamond cold cathode based X-ray source, Edwin J. Grant, Chrystian M. Posada, Missouri Univ. of Science and Technology (USA); Ralu Divan, Anirudha V. Sumant, Dan Rosenmann, Liliana Stan, Argonne National Lab. (USA); Ashish Avachat, Carlos H. Castano, Hyong Koo Lee, Missouri Univ. of Science and Technology (USA) .[9033-220]

Model predictions for the WAXS signals of healthy and malignant breast duct biopsies, Robert J. LeClair, Laurentian Univ. (Canada). . . . . .[9033-221]

X-ray coherent scatter imaging for surgical margin detection: a Monte Carlo study, Manu N. Lakshmanan, Anuj J. Kapadia, Duke Univ. Medical Ctr. (USA); Brian P Harrawood, Duke University Medical Center (USA); David J. Brady, Duke Univ. (USA); Ehsan Samei, Duke Univ. Medical Ctr. (USA) . . . . . .[9033-222]

Limitations of anti-scatter grids when used with high resolution image detectors, Vivek Singh, Amit Jain, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) . . . . . .[9033-223]

The beam stop array algorithm considering geometric effect in digital breast tomosynthesis, Haeng-hwa Lee, Ye-Seul Kim, Hye-Suk Park, Hee-Joung Kim, Yonsei Univ. (Korea, Republic of); JaeGu Choi, Young-Wook Choi, Korea Electrotechnology Research Institute (Korea, Republic of) . . . . . .[9033-224]

Scatter reduction for high resolution image detectors with a region of interest attenuator, Amit Jain, Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) . . .[9033-225]

Potential use of a single scatter model in breast CBCT applications, Curtis V. Laamanen, Robert J. LeClair, Laurentian Univ. (Canada). . . . . .[9033-226]

Conference 9035 Posters
Computer-Aided Diagnosis

Breast

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

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

A content based framework for mass retrieval in mammograms, Simranjit Kaur, Vipul Sharma, Sukhwinder Singh, Savita Gupta, Panjab Univ. (India) and Univ. Institute of Engineering and Technology (India). . . . . .[9035-58]

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

A new mass classification system derived from multiple features and a trained MLP model, Maxine Tan, The Univ. of Oklahoma (USA); Jiantao Pu, Univ. of Pittsburgh (USA); Bin Zheng, The Univ. of Oklahoma (USA). . . . . [9035-60]

Automated breast tissue density assessment using high order regional texture descriptors in mammography, Yan Nei Law, Bioinformatics Institute (Singapore); Monica K. Lieng, Juniata College (USA); Jingmei Li, Genome Institute of Singapore (Singapore); David Aik-Aun Khoo, Bioinformatics Institute (Singapore) . . . . . .[9035-61]

Improving breast mass detection using histogram of oriented gradients, Victor V. Pomponiu, Harishwaran Hariharan, Univ. of Pittsburgh (USA); Bin Zheng, The Univ. of Oklahoma (USA); David Gur, Univ. of Pittsburgh School of Medicine (USA). . . . . .[9035-62]

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

Bilateral image subtraction features for multivariate automated classification of breast cancer risk, José M. Celaya-Padilla, Juan R. Rodriguez Sr., Jorge I. Galván-Tejada, Antonio Martínez-Torteya Sr., Victor M. Treviño-Alvarado Sr., José G. Tamez-Peña, Tecnológico de Monterrey (Mexico). . . . . .[9035-64]

Roles of biologic breast tissue composition and quantitative image analysis of mammographic images in breast tumor characterization, Karen Drukker, Maryellen L. Giger, The Univ. of Chicago Medical Ctr. (USA); Fred Duewer, Serghei Malkov, Christopher Flowers, Bonnie Joe, Karla Kerlikowske, Univ. of California, San Francisco (USA); Jennifer S. Drukteinis, H. Lee Moffitt Cancer Ctr. & Research Institute (USA); John A. Shepherd, Univ. of California, San Francisco (USA) . . . . . [9035-65]

New method for predicting estrogen receptor status utilizing breast MRI texture kinetic analysis, Baishali Chaudhury, Dmitry B. Goldgof, Lawrence O. Hall, Univ. of South Florida (USA); Robert A. Gatenby, Jennifer S. Drukteinis, Robert J. Gillies, H. Lee Moffitt Cancer Ctr. & Research Institute (USA). . . . . [9035-66]

Exploring perceptually similar cases with multidimensional scaling, Juan Wang, Yongyi Yang, Miles N. Wernick, Illinois Institute of Technology (USA); Robert M. Nishikawa, The Univ. of Chicago (USA). . . . . .[9035-67]

Application of computer-extracted breast tissue texture features in predicting false-positive recalls from screening mammography, Shonket Ray, Jae Young Choi, Univ. of Pennsylvania (USA); Brad M. Keller, Jinbo Chen, Univ. of Pennsylvania School of Medicine (USA); Emily F. Conant, Despina Kontos, The Univ. of Pennsylvania Health System (USA). . . . . [9035-68]

Chest wall segmentation in automated 3D breast ultrasound images using thoracic volume classification, Tao Tan, Jan van Zelst, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Wei Zhang, QView Medical, Inc. (USA); Ritse M. Mann, Bram Platel, Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands). . . . . [9035-69]

Classification of breast lesions presenting as mass and non-masss lesions, Cristina Gallego, Anne L. Martel, Univ. of Toronto (Canada) and Sunnybrook Research Institute (Canada). . . . .[9035-70]

Head, Neck, and Novel

Computer-based assessment of left ventricular regional ejection fraction in patients after myocardial infarction, Soo Kng Teo, Yi Su, A*STAR Institute of High Performance Computing (Singapore); Ru-San Tan, Liang Zhong, National Heart Centre, Singapore (Singapore). . .[9035-23]

Can grey matter in hippocampus and parahippocampus be taken as features of Alzheimer's disease?, Yan'e Guo, Zengqiang Zhang, Bo Zhou, Pan Wang, Hongxiang Yao, Chinese PLA General Hospital (China); Mingshao Yuan, Jimo People's Hospital (China); Ningyu An, Haitao Dai, Luning Wang, Xi Zhang, Chinese PLA General Hospital (China). . . . . .[9035-72]

Toward early diagnosis of arteriosclerotic diseases: collaborative detection of carotid artery calcifications by computer and dentists on dental panoramic radiographs, Chisako Muramatsu, Ryo Takahashi, Takeshi Hara, Gifu Univ. School of Medicine (Japan); Tatsuro Hayashi, Media Co., Ltd. (Japan); Akitoshi Katsumata, Asahi Univ. (Japan); Xiangrong Zhou, Hiroshi Fujita, Gifu Univ. School of Medicine (Japan) . . . . . .[9035-73]

Automatic classification of schizophrenia using resting-state functional language network via an adaptive learning algorithm, Maohu Zhu, Nanfeng Jie, Tianzi Jiang, Institute of Automation (China). . . . . .[9035-74]

Accurate discrimination of Alzheimer's disease from other dementia and/or normal subjects using SPECT specific volume analysis, Hitoshi Iyatomi, Hosei Univ. (Japan); Jun Hashimoto, Fumuhito Yoshii, Toshiki Kazama, Shuichi Kawada, Tetsu Niwa, Yutaka Imai, Tokai Univ. School of Medicine (Japan) . . . . .[9035-75]

Automatic pathology classification using a single feature machine-learning support-vector machines, Fernando Yepes-Calderon, Univ. de Barcelona (Spain); Fabian Pedregosa, Bertrand Thirion, INRIA Saclay - Île-de-France (France); Yalin Wang, Arizona State Univ. (USA); Natasha Lepore, Children's Hospital Los Angeles (USA) . . . . . .[9035-76]

Fiber-based representation and supervised classification of diffusion tensor MRI brain scans, Gali Zimmerman Moreno, Tel Aviv Univ. (Israel); Dafna Ben Bashat, Moran Artzi, Beatrice Nefussy, Tel-Aviv Sourasky Medical Ctr. (Israel); Vivian Drory, Tel Aviv Univ. (Israel); Orna Aizenstein, Tel-Aviv Sourasky Medical Ctr. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . .[9035-77]

MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression, Antonio Martínez-Torteya, Juan A. Rodriguez-Rojas, José M. Celaya-Padilla, Jorge I. Galván-Tejada, Victor M. Treviño-Alvarado Sr., José G. Tamez-Peña, Tecnológico de Monterrey (Mexico). . . . . .[9035-78]

Volume curtaining: a focus+context effect for multimodal volume visualization, Ross Maciejewski, Adam J. Fairfield, Jonathan D. Plasencia, Arizona State Univ. (USA); Yun Ho Jang, Sejong Univ. (Korea, Republic of); Nicholas Theodore, Barrow Neurosurgical Associates (USA); Neil Crawford, St. Joseph's Hospital and Medical Ctr. (USA); David H. Frakes, Arizona State Univ. (USA). . . . . .[9035-80]

Multilevel image recognition using discriminative patches and kernel covariance descriptor, Le Lu, Jianhua Yao, Evrim B. Turkbey, Ronald M. Summers, National Institutes of Health (USA). . . . . .[9035-81]

Surgical retained foreign object (RFO) prevention by computer aided detection (CAD), Theodore C. Marentis, Lubomir M. Hadjiyski, Lucas Rondon, Amrita R. Chaudhury, Univ. of Michigan Health System (USA); Nikolaos Chronis, Univ. of Michigan (USA); Heang-Ping Chan, Univ. of Michigan Health System (USA) . .[9035-82]

Positive automated diagnosis of Alzheimer's disease using the joint PiB-18F-FDG PET image histogram, Jon J. Camp, Mayo Clinic (USA); Dennis P. Hanson, Mayo Clinic (USA); David R. Holmes III, Bradley J. Kemp, Mayo Clinic (USA); Stephen D Weigan, Matthew L Senjem, Melissa Murray, Dennis W Dickson, Joseph Parisi, Mayo Clinic (USA); Clifford R. Jack, Ronald C. Petersen, Val J. Lowe, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA). . . . . .[9035-83]

Differentiating recurrent glioblastoma multiforme from radiation induced effects via texture analysis on multi-parametric MRI, Pallavi Tiwari, Case Western Reserve Univ. (USA); Lisa Rogers, Leo Wolansky, Andrew Sloan, Mark Cohen, Univ. Hospitals of Cleveland (USA); Anant Madabhushi, Case Western Reserve Univ. (USA). . . . . .[9035-84]

Lung, Chest, and Abdomen

Efficient 3D texture feature extraction from CT images for computer-aided diagnosis of pulmonary nodules, Fangfang Han, Northeastern Univ. (China) and Neusoft Corp. (China); Huafeng Wang, Stony Brook Univ. (USA); Bowen Song, Stony Brook Medicine (USA); Guopeng Zhang, Hongbing Lu, Fourth Military Medical Univ. (China); William Moore, Zhengrong Liang, Stony Brook Medicine (USA); Hong Zhao, Northeastern Univ. (China) and Neusoft Corp. (China) . . . . . .[9035-85]

A novel computer-aided detection system for pulmonary nodule identification in CT images, Hao Han, Stony Brook Univ. (USA); Lihong C. Li, College of Staten Island (USA); Huafeng Wang, Hao Zhang, Stony Brook Univ. (USA); William Moore, Zhengrong Liang, Stony Brook Medicine (USA). . . . . .[9035-86]

Comparison of biophysical factors on emphysema quantification: relationship to the inspiration level of the emphysema index, Changyong Heo, Seoul National Univ. (Korea, Republic of); Jong Hyo Kim, Seoul National Univ. (Korea, Republic of) and Seoul National Univ. College of Medicine (Korea, Republic of). . . . . .[9035-87]

Microstructure analysis of the pulmonary lung of the secondary lobulus by a synchrotron radiation CT, Yasunori Fukuoka, Yoshiki Kawata, Noboru Niki, Univ. of Tokushima (Japan); Keiji Umetani, Japan Synchrotron Radiation Research Institute (Japan); Yasutaka Nakano, Shiga Univ. of Medical Science (Japan); Noriyuki Moriyama, Hironobu Ohmatsu, National Cancer Ctr. Hospital East (Japan); Harumi Itoh, Univ. of Fukui (Japan). . . . . .[9035-88]

Wavelet based rotation invariant texture feature for lung tissue classification and retrieval, Jatindra K. Dash, Sudipta Mukhopadhyay, Rahul Das Gupta, Indian Institute of Technology Kharagpur (India); Mandeep K. Garg, Nidhi Prabhakar, Niranjan Khandelwal, Postgraduate Institute of Medical Education & Research (India). . . . . .[9035-89]

Effect of image variation on computer aided detection systems, Parisa Rabbani, KTH Royal Institute of Technology (Sweden); Pragnya Maduskar, Rick Philipsen, Laurens E. Hogeweg, Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . .[9035-90]

3D mapping of airway wall thickening in asthma with MSCT: a level set approach, Catalin Fetita, Télécom SudParis (France); Pierre-Yves Brillet, Univ. Paris 13 (France); Philippe Grenier, Univ. Pierre et Marie Curie (France) . . .[9035-91]

3D intrathoracic region definition and its application to PET-CT analysis, Ronnarit Cheirsilp, The Pennsylvania State Univ. (USA); Rebecca Bascom, Thomas W Allen, The Pennsylvania State Univ (USA); William E. Higgins, The Pennsylvania State Univ. (USA) . . . . . .[9035-92]

Lung texture classification using bag of visual words, Marina Asherov, Idit Diamant, Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . .[9035-93]

Automated segmentation of murine lung tumors in X-ray micro-CT images, Joshua K. Y. Swee, Imperial College London (UK) and Siemens Corporate Research (USA); Clare Sheridan, Elza de Bruin, Julian Downward, Francois Lassaily, Cancer Research UK (UK); Luis Pizarro Quiroz, Imperial College London (UK) . . . . . .[9035-94]

Longitudinal follow-up study of smoking-induced emphysema progression in low-dose CT screening of lung cancer, Hidenobu Suzuki, Yoshiki Kawata, Noboru Niki, Univ. of Tokushima (Japan); Yasutaka Nakano, Shiga Univ. of Medical Science (Japan); Hironobu Ohmatsu, Masahiko Kusumoto, Takaaki Tsuchida, National Cancer Ctr. Hospital East (Japan); Kenji Eguchi, Teikyou Univ. (Japan); Noriyuki Moriyama, National Cancer Ctr. Hospital East (Japan). . . . . .[9035-95]

Potential usefulness of a topic model-based categorization of lung cancers as quantitative CT biomarkers for predicting the recurrence risk after curative resection, Yoshiki Kawata, Noboru Niki, Univ. of Tokushima (Japan); Hironobu Ohamatsu, Keiju Aokage, Mitsuo Satake, 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); Noriyuki Moriyama, Tokyo Midtown Medical Ctr. (Japan) . . .[9035-96]

Computerized organ localization in abdominal CT volume with context-driven generalized Hough transform, Jing Liu, Qiang Li, Shanghai Advanced Research Institute (China) . . . . .[9035-97]

Segmentation of urinary bladder in CT urography (CTU) using CLASS with enhanced contour conjoint procedure, Kenny Cha, Lubomir M. Hadjiiski, Heang-Ping Chan, Richard H. Cohan, Elaine M. Caoili, Chuan Chou, Univ. of Michigan (USA) . . . . . .[9035-98]

Level-set based free fluid segmentation with improved initialization using region growing in 3D ultrasound sonography, Dae Hoe Kim, KAIST (Korea, Republic of); Konstantinos N. Plataniotis, Univ. of Toronto (Canada); Yong Man Ro, KAIST (Korea, Republic of) . . . . . .[9035-99]

Performance of an automated renal segmentation algorithm based on morphological erosion and connectivity, Benjamin Abiri, New York Univ. School of Medicine (USA); Brian Park, New York Univ. (USA); Hersh Chandarana, Artem Mikheev, New York Univ. Langone Medical Ctr. (USA); Vivian S. Lee, Univ. of Utah Health Systems (USA); Henry Rusinek, New York Univ. Langone Medical Ctr. (USA) . . . . . .[9035-100]

COMPASS based ureter segmentation in CT urography (CTU), David W. Zick, Lubomir M. Hadjiyski, Heang-Ping Chan, Richard H. Cohan, Elaine M. Caoili, Chuan Zhou, Jun Wei, Univ. of Michigan Health System (USA) . . . . . .[9035-101]

Ultrasound based computer-aided-diagnosis of kidneys for pediatric hydronephrosis, Juan J. Cerrolaza, Craig A. Peters, Aaron D. Martin, Emmarie Myers, Nabile M. Safdar, Marius George Linguraru, Children's National Medical Ctr. (USA) . . . . . .[9035-102]

Automated abdominal lymph node segmentation based on RST analysis and SVM, Yukitaka Nimura, Yuichiro Hayashi, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazuhiro Furukawa, Nagoya Univ. (Japan); Kazunari Misawa, Aichi Cancer Ctr. Research Institute (Japan); Kensaku Mori, Nagoya Univ. (Japan). . . . . .[9035-103]

A universal approach for automatic organ segmentations on 3D CT images based on organ localization and 3D GrabCut, Xiangrong Zhou, Gifu Univ. School of Medicine (Japan); Takaaki Ito, Gifu Univ. (Japan); Xinxin Zhou, Nagoya Bunri Univ. (Japan); Huayue Chen, Gifu Univ. School of Medicine (Japan); Takeshi Hara, Gifu Univ. (Japan); Ryujiro Yokoyama, Gifu Univ. School of Medicine (Japan); Masayuki Kanematsu, Hiroaki Hoshi, Gifu Univ. (Japan); Hiroshi Fujita, Gifu Univ. School of Medicine (Japan) . . . .[9035-104]

Prostate and Colon

A novel colonic polyp volume segmentation method for computer tomographic colonography, Huafeng Wang, Stony Brook Medicine (USA); Lihong C. Li, College of Staten Island (USA); Hao Han, Bowen Song, Hao Peng, Stony Brook Medicine (USA); Yunhong Wang, Lihua Wang, BeiHang Univ. (China); Zhengrong Liang, Stony Brook Medicine (USA) . . . . . .[9035-105]

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

GISentinel: a software platform for automatic ulcer detection on capsule endoscopy videos, Steven Yi, Heng Jiao, Fan Meng, Xyken, LLC (USA); Jonathan A. Leighton, Pasha Shabana, Lauri Rentz, Mayo Clinic (USA). . . . . .[9035-107]

Vessels, Heart, and Eye

Retinal image quality assessment using generic features, Mahnaz Fasih, J. M. Pierre Langlois, Ecole Polytechnique de Montréal (Canada); Houssem Ben Tahar, DIAGNOS Inc. (Canada); Farida Cheriet, Ecole Polytechnique de Montréal (Canada) . . . . . .[9035-108]

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

Glaucoma detection based on local binary patterns in fundus photographs, Maya Alsheh Ali, Thomas Hurtut, Univ. Paris Descartes (France) and Ecole Polytechnique de Montréal (Canada); Timothée Faucon, DIAGNOS Inc. (Canada); Farida Cheriet, Ecole Polytechnique de Montréal (Canada) . . . . . .[9035-111]

Automatic multiresolution age-related macular degeneration detection from fundus images, Mickaël Garnier, Thomas Hurtut, Univ. Paris Descartes (France) and Ecole Polytechnique de Montréal (Canada); Houssem Ben Tahar, DIAGNOS Inc. (Canada); Farida Cheriet, Ecole Polytechnique de Montréal (Canada). . . . . .[9035-112]

Preliminary study on differentiation between glaucomatous and non-glaucomatous eyes on stereo fundus images using cup gradient models, Chisako Muramatsu, Gifu Univ. School of Medicine (Japan); Yuji Hatanaka, Univ. of Shiga Prefecture (Japan); Kyoko Ishida, Akira Sawada, Tetsuya Yamamoto, Hiroshi Fujita, Gifu Univ. School of Medicine (Japan). . . . . .[9035-114]

Segmentation of enhanced depth imaging optical coherence tomography images using wavelet based graph cut algorithm, Hossein Rabbani, Isfahan Univ. of Medical Sciences (Iran, Islamic Republic of) . . . . . .[9035-115]

From medical imaging to computer simulation of fractional flow reserve in four coronary artery trees, Simone Melchionna, Massimo Bernaschi, Mauro Bisson, Consiglio Nazionale delle Ricerche (Italy); Nahyup Kang, Hyong-Euk Lee, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . .[9035-116]

Learning-based automatic detection of severe coronary stenoses in CT angiographies, Imen Melki, GE Healthcare (France) and Univ. Paris-Est Marne-la-Vallée (France); Cyril Cardon, Nicolas Gogin, GE Healthcare (France); Hugues Talbot, Laurent Najman, Univ. Paris-Est Marne-la-Vallée (France) . . . . . .[9035-117]

Time-resolved volumetric MRI blood flow: a Doppler ultrasound perspective, Roy van Pelt, Technische Univ. Eindhoven (Netherlands); Javier Olivan-Bescos, Philips Healthcare (Netherlands); Eike Nagel, King's College London (UK); Anna Vilanova, Technische Univ. Eindhoven (Netherlands). . . . . .[9035-118]

Musculoskeletal and Miscellaneous

Description of patellar movement by 3D parameters obtained from dynamic CT acquisition, Marina F. S. de Sá Rebelo, Ramon A. Moreno, Marco A. Gutierrez, Riccardo G. Gobbi, Luiz F. R. Avila, Gilberto L. Camanho, Univ. de São Paulo (Brazil) . . . . . .[9035-120]

Wide association study of radiological features that predict future knee OA pain: data from the OAI, Jorge I. Galván-Tejada, José M. Celaya-Padilla, Antonio Martínez-Torteya Sr., Juan A. Rodriguez-Rojas, Victor M. Treviño-Alvarado Sr., José G. Tamez-Peña, Tecnológico de Monterrey (Mexico). . . . . .[9035-121]

Vertebral degenerative disc disease severity evaluation using random forest classification, Hector E. Munoz, Jianhua Yao, National Institutes of Health (USA); Joseph E. Burns, Yasuyuki Pham, Univ. of California, Irvine (USA); James Stieger, Ronald M. Summers, National Institutes of Health (USA) . . . . . [9035-122]

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

Towards quantitative assessment of calciphylaxis, Thomas M. Deserno, István Sárándi, Daniel Haak, Stephan Jonas, Paula Specht, Vincent Brandenburg, RWTH Aachen (Germany) . . . . . [9035-124]

Towards robust identification and tracking of Nevi in sparse photographic time series, Jakob Vogel, Alexandru O. Duliu, Technische Univ. München (Germany); Yuji Oyamada, School of Fundamental Science and Engineering, Waseda Univ. (Japan); Jose Gardiazabal, Technische Univ. München (Germany); Tobias Lasser, Technische Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); Mahzad Ziai, Rüdiger Hein, Nassir Navab, Technische Univ. München (Germany) . . . . . [9035-125]

Evaluation of a computer-aided skin cancer diagnosis system for conventional digital photography with manual segmentation, Adam Huang, National Central Univ. (Taiwan); Wen-Yu Chang, I-Shou Univ. (Taiwan); Cheng-Han Hsieh, Hsin-Yi Liu, National Central Univ. (Taiwan); Gwo-Shing Chen, Kaohsiung Medical Univ. (Taiwan) . . . . . [9035-126]

Computer-aided diagnosis of diabetic peripheral neuropathy, Viktor Chekh, The Univ. of New Mexico (USA); Peter Soliz, Elizabeth McGrew, Simon Barriga, VisionQuest Biomedical, LLC (USA); Mark R. Burge, Shuang Luan, The Univ. of New Mexico (USA) . . . . . [9035-127]

An automatic early stage alveolar-bone-resorption evaluation method on digital dental panoramic radiographs, Min Zhang, Gifu Univ. School of Medicine (Japan); Akitoshi Katsumata, Asahi Univ. (Japan); Chisako Muramatsu, Takeshi Hara, Gifu Univ. School of Medicine (Japan); Hiroki Suzuki, Asahi Univ. (Japan); Hiroshi Fujita, Gifu Univ. School of Medicine (Japan). . . . . [9035-128]

A method for automatic liver segmentation from multi-phase contrast-enhanced CT images, Rong Yuan, Ming Luo, Huazhong Univ. of Science and Technology (China); Luyao Wang, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China); Shaofa Wang, Tongji Medical College (China); Qingguo Xie, Huazhong Univ. of Science and Technology (China) and Wuhan National Lab. for Optoelectronics (China) . . . . . [9035-129]

Classification of weak specular reflections in laparoscopic images, Bidisha Chakraborty, J. Marek Marcinczak, Rolf-Rainer Grigat, Technische Univ. Hamburg-Harburg (Germany) . . [9035-130]

Active shape models incorporating isolated landmarks for medical image annotation, Tobias Norajitra, Hans-Peter Meinzer, Bram Stieltjes, Klaus H. Maier-Hein, Deutsches Krebsforschungszentrum (Germany) . . . . . [9035-131]

Texture feature based liver lesion classification, Yeela Doron, Nitzan Mayer-Wolf, Idit Diamant, Tel Aviv Univ. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel) and ICSI (USA) . . . . . [9035-132]

Automatic seed selection for segmentation of liver cirrhosis in laparoscopic sequences, Rahul Sinha, J. Marek Marcinczak, Rolf-Rainer Grigat, Technische Univ. Hamburg-Harburg (Germany) . . . . . [9035-133]

Infective endocarditis detection through SPECT/CT images digital processing, Albino Moreno-Gómez, Raquel Valdes-Cristerna, Luis Jiménez-Ángeles, Univ. Autónoma Metropolitana-Iztapalapa (Mexico); Enrique Vallejo, Univ. Nacional Autónoma de México (Mexico); Salvador Hernández Sandoval, Gabriel Soto, Instituto Nacional de Cardiología - Ignacio Chávez (Mexico) . . . . . [9035-134]

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

Conference 9036 Posters
Image-Guided Procedures, Robotic Interventions, and Modeling

Automatic thoracic anatomy segmentation at CT using hierarchical fuzzy models and registration, Kaioqiong Sun, Nanchang Hangkong Univ. (China); Jayaram K. Udupa, Dewey Odhnera, Univ. of Pennsylvania (USA); Yubing Tong, The Univ. of Pennsylvania Health System (USA) . . . . . [9036-25]

Towards enabling ultrasound guidance in cervical cancer high-dose rate brachytherapy, Adrian Wong, Samira Sojoudia, The Univ. of British Columbia (Canada); Marc Gaudet, British Columbia Cancer Agency (Canada); Wan Wan Yap, Silvia D. Chang, Purang Abolmaesumi, The Univ. of British Columbia (Canada); Christina Aquino-Parsons, British Columbia Cancer Agency (Canada); Mehdi Moradi, The Univ. of British Columbia (Canada) . . . . . [9036-50]

Detection of tooth fractures in CBCT images using attention index estimation, Andre Souza, Carestream Health, Inc. (USA); Alexandre X. Falcão, Univ. Estadual de Campinas (Brazil); Lawrence A. Ray, Carestream Health, Inc. (USA) . . . . . [9036-61]

Segmentation of 3D ophthalmic CT images based on the analytic eye model for the purposes of proton therapy planning, Anastasia Makarova, Dmitrij Orlov, Igor Erokhin, Mihail Lomanov, Institute for Theoretical and Experimental Physics (Russian Federation) . . . [9036-62]

Updating a preoperative surface model with information from real-time tracked 2D ultrasound using a Poisson surface reconstruction algorithm, Deyu Sun, Maryam E. Rettmann, David R. Holmes III, Mayo Clinic (USA); Cristian A. Linte, Mayo Clinic College of Medicine (USA); Douglas L. Packer, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA) . . . . . [9036-63]

Hand-eye calibration using dual quaternions in medical environment, Danilo Briese, Siemens AG (Germany) and Otto-von-Guericke-Univ. Magdeburg (Germany); Christine Niebler, Siemens AG (Germany); Georg Rose, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . [9036-64]

Distribution of guidance models for cardiac resynchronization therapy in the setting of multi-center clinical trials, Martin Rajchl, Kamyar Abhari, John Stirrat, Eranga Ukwatta, Diego Cantor-Rivera, Feng P. Li, Terry M. Peters, James A. White, Robarts Research Institute (Canada) . . . . . [9036-65]

Open framework for management and processing of multi-modality and multidimensional imaging data for analysis and modeling muscular function, David García, Univ. Hospital of Geneva (Switzerland); Bénédicte M. A. Delattre, Philips Healthcare (Switzerland); Sara Trombella, Univ. Hospital of Geneva (Switzerland); Sean Lynch, Medizinische Hochschule Hannover (Germany); Matthias Becker, Univ. of Geneva (Switzerland); Hon Fai Choi, Univ. of Geneva (Switzerland); Osman Ratib, Univ. Hospital of Geneva (Switzerland) . . . . . [9036-66]

Innovation in aortoiliac stenting, an in vitro comparison, Erik Groot Jebbink, Univ. Twente (Netherlands) and Rijnstate Hospital (Netherlands); Peter C. J. M. Goverde, Vascular Clinic ZNA (Belgium); Jacques A. van Oostayen, Michel M. P. J. Reijnen, Rijnstate (Netherlands); Cornelis H. Slump, Univ. Twente (Netherlands) . . . . . [9036-67]

Preliminary study of rib articulated model based on dynamic fluoroscopy images, Pierre-Frederic Villard, LORIA (France); Pierre Escamilla, GE Healthcare (France); Erwan Kerrien, INRIA (France); Sébastien Gorges, Yves L. Trousset, GE Healthcare (France); Marie-Odile Berger, INRIA (France) . . . . . [9036-69]

Solving for free-hand and real-time 3D ultrasound calibration with anisotropic orthogonal Procrustes analysis, Elvis C. S. Chen, Robarts Research Institute (Canada); A. Jonathan McLeod, Uditha L. Jayarathne, Western Univ. Canada (Canada); Terry M. Peters, Robarts Research Institute (Canada) . . . . [9036-70]

Motion and deformation compensation for freehand prostate biopsies, Siavash Khallaghi, Saman Nouranian, Samira Sojoudi, Hussam A. Ashab, Lindsay Machan, Silvia D. Chang, Peter Black, Martin Gleave, Larry Goldenberg, Septimiu E. Salcudean, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . [9036-71]

Effects of intraoperative CT scanning on the accuracies of electromagnetic tracking, Elodie Lugez, Queen's Univ. (Canada); David R. Pichora, Kingston General Hospital (Canada); Selim G. Akl, Randy E. Ellis, Queen's Univ. (Canada) . . . . . [9036-73]

SimITK: model driven engineering for medical imaging, Melissa Trezise, Queen's Univ. (Canada); David Gobbi, Univ. of Calgary (Canada); James Cordy, Queen's Univ. (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada); Parvin Mousavi, Queen's Univ. (Canada) . . . . . [9036-74]

Automatic labeling and segmentation of vertebrae in CT images, Abtin Rasoulian, Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . [9036-75]

Design and development of an ultrasound calibration phantom and system, Alexis Cheng, Martin K. Ackerman, Gregory S. Chirikjian, Johns Hopkins Univ. (USA); Emad M. Boctor, Johns Hopkins Outpatient Ctr. (USA) . . . . . [9036-76]

Computational modeling and analysis for left ventricle motion using CT/Echo image fusion, Ji-Yeon Kim, Nahyup Kang, James D. K. Kim, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [9036-77]

Colonoscope navigation system using colonoscope tracking method based on line registration, Masahiro Oda, Hiroaki Kondo, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazuhiro Furukawa, Ryoji Miyahara, Nagoya Univ. Graduate School of Medicine (Japan); Yoshiki Hirooka, Nagoya Univ. Hospital (Japan); Hidemi Goto, Nagoya Univ. Graduate School of Medicine (Japan); Nassir Navab, Technische Univ. München (Germany); Kensaku Mori, Nagoya Univ. (Japan) . . . . . [9036-78]

Time-resolved thermography for cold bolus detection at the human cerebral cortex, Julia Hollmach, Christian Schnabel, Nico Hoffmann, Yordan Radev, Stephan B. Sobottka, Matthias Kirsch, Gabriele Schackert, Edmund Koch, Gerald Steiner, Technische Univ. Dresden (Germany) . . . . . [9036-79]

Registration based filtering: an acceptable tool for noise reduction in left ventricular dynamic rotational angiography images?, Jean-Yves Wielandts, Stijn De Buck, Joris Ector, Dieter Nuyens, Frederik Maes, Hein Heidbuchel, Katholieke Univ. Leuven (Belgium) . . . . . [9036-80]

Dimensional accuracy of 3D printed vertebra, Kent M. Ogden, Nathaniel Ordway, Dalanda Diallo, Gwen Tillapaugh-Fay, SUNY Upstate Medical Univ. (USA); Can Asian, Syracuse Univ. (USA). [9036-81]

A tool for intraoperative visualization of registration results, Franklin King, Andras Lasso, Csaba Pinter, Gabor Fichtinger, Queen's Univ. (Canada) . . . . . .[9036-82]

Effects of deformable registration algorithms on the creation of statistical maps for preoperative targeting in deep brain stimulation procedures, Yuan Liu, Pierre-François D'Haese, Benoit M. Dawant, Vanderbilt Univ. (USA) . .[9036-83]

Design of a tracked ultrasound calibration phantom made of LEGO bricks, Ryan A. Walsh, Marie Soehl, Adam Rankin, Andras Lasso, Queen's Univ. (Canada); Gabor Fichtinger, Queen's Univ. (Canada) and Cancer Care Ontario (Canada) . . . . . .[9036-84]

SPECT-US image fusion and clinical applications, Johann B. Hummel, Marcus Kaar, Rainer Hoffmann, Wolfgang Birkfellner, Thomas Beyer, Anton Staudenherz, Michael Figl, Medizinische Univ. Wien (Austria). . . . . [9036-85]

Dual-projection 3D-2D registration for surgical guidance: preclinical evaluation of performance and minimum angular separation, Ali Uneri, Yoshito Otake, Adam S. Wang, Johns Hopkins Univ. (USA); Gerhard Kleinszig, Sebastian Vogt, Siemens Healthcare (Germany); Gary L. Gallia, Daniele Rigamonti, Jean-Paul Wolinsky, Ziya L. Gokaslan, Akhil J. Khanna, Johns Hopkins Univ. (USA); Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . .[9036-86]

Feasibility of a touch-free user interface for ultrasound snapshot-guided nephrostomy, Simon Kotwicz, Andras Lasso, Tamas Ungi, Gabor Fichtinger, Queen's Univ. (Canada) . . . . . .[9036-87]

Active shape models with optimized texture features for radiotherapy planning of prostate cancer, Kun Cheng, Yang Feng, Dean Montgomery, Edinburgh Cancer Research UK Ctr. (UK) and The Univ. of Edinburgh (UK); Duncan B. McLaren, Edinburgh Cancer Research UK Ctr. (UK); Stephen McLaughlin, Heriot-Watt Univ. (UK); William H. Nailon, Edinburgh Cancer Research UK Ctr. (UK). . .[9036-88]

Heuristic estimation of electromagnetically tracked catheter shape for image-guided vascular procedures, Fuad N. Mefleh, Clemson Univ. (USA); George H. Baker, Medical Univ. of South Carolina (USA); David M. Kwartowitz, Clemson Univ. (USA) and Medical Univ. of South Carolina (USA) . . . . . .[9036-89]

A dimensionless dynamic contrast enhanced MRI parameter for intra-prostatic tumor target volume delineation: initial comparison with histology, Thomas Hrinivich, Western Univ. Canada (Canada) and Robarts Research Institute (Canada) and London Regional Cancer Program (Canada); Eli D. Gibson, Western Univ. Canada (Canada) and Robarts Research Institute (Canada); Mena Gaed, Western Univ. Canada (Canada) and Robarts Research Institute (Canada) and Lawson Health Research Institute (Canada); José A. Gomez-Lemus, Madeleine Moussa, Western Univ. Canada (Canada); Charlie McKenzie, Western Univ. Canada (Canada) and Robarts Research Institute (Canada); Glenn S. Bauman, The Univ. of Western Ontario (Canada) and London Regional Cancer Program (Canada) and Lawson Health Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) and London Regional Cancer Program (Canada); Aaron Fenster, Western Univ. Canada (Canada) and Robarts Research Institute (Canada) and Lawson Health Research Institute (Canada); Eugene Wong, Western Univ. Canada (Canada) and London Regional Cancer Program (Canada) and Lawson Health Research Institute (Canada) . . . . . [9036-90]

3D non-rigid surface-based MR-TRUS registration for image-guided prostate biopsy, Yue Sun, Wu Qiu, Robarts Research Institute (Canada); Cesare Romagnoli, The Univ. of Western Ontario (Canada); Aaron Fenster, Robarts Research Institute (Canada) . . . . . .[9036-91]

A CT prostate segmentation for ultrasound-guided CT-based HDR brachytherapy, Xiaofeng Yang, Peter Rossi, Tomi Ogunleye, Walter Curran, Tian Liu, Emory Univ. (USA) . . . . . .[9036-92]

Identifying MRI markers to evaluate early treatment related changes post laser ablation for cancer pain management, Pallavi Tiwari, Case Western Reserve Univ. (USA); Shabbar Danish, Univ. of Medicine & Dentistry of New Jersey (USA); Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . .[9036-93]

Development and evaluation of optical needle depth sensor for percutaneous diagnosis and therapies, Keryn Palmer, David Alelyunas, Connor McCann, Kitaro Yoshimitsu, Brigham and Women's Hospital (USA); Takahisa Kato, Brigham and Women's Hospital (USA) and Canon U.S.A, Inc. (USA); Sang-Eun Song, Nobuhiko Hata, Brigham and Women's Hospital (USA) . . . . . .[9036-94]

Image to physical space registration of supine breast MRI for image guided breast surgery, Rebekah H. Conley, Vanderbilt Univ. (USA); Ingrid M. Meszoely, Vanderbilt Univ. Medical Ctr. (USA); Thomas S. Pheiffer, Logan W. Clements, Jared A. Weis, Thomas E. Yankeelov, Michael I. Miga, Vanderbilt Univ. (USA) . . . . . .[9036-95]

A global CT to US registration of the lumbar spine, Simrin Nagpal, Queen's Univ. (Canada); Ilker Hacihaliloglu, The Univ. of British Columbia (Canada); Tamas Ungi, Queen's Univ. (Canada); Abtin Rasoulian, The Univ. of British Columbia (Canada); Dan P. Borschneck, Kingston General Hospital (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada); Parvin Mousavi, Queen's Univ. (Canada) . . . . . .[9036-96]

Rigid point registration circuits, J. Michael Fitzpatrick, Vanderbilt Univ. (USA) . . . . . .[9036-97]

Needle localization using a moving stylet/catheter in ultrasound-guided regional anesthesia: a feasibility study, Parmida Beigi, Robert N. Rohling, The Univ. of British Columbia (Canada) . . . . . .[9036-98]

Tracked ultrasound calibration studies with a phantom made of LEGO bricks, Marie Soehl, Ryan A. Walsh, Adam Rankin, Andras Lasso, Gabor Fichtinger, Queen's Univ. (Canada). . . . . .[9036-99]

Mapping surgical fields by moving a laser-scanning multimodal scope attached to a robot arm, Yuanzhen Gong, Timothy D. Soper, Vivian W. Hou, Danying Hu, Blake Hannaford, Eric J. Seibel, Univ. of Washington (USA) . . . . . .[9036-100]

Conference 9039 Posters

PACS and Imaging Informatics: Next Generation and Innovations

Image-based improvement of OpenClinica's electronic case-report forms, Xinzhou Xie, Yan Zhang, Fudan Univ. (China); Stephan Jonas, Christian Druyen, Johan Gehlen, Uniklinik RWTH Aachen (Germany); Yuanyuan Wang, Fudan Univ. (China); Nikolaus Marx, Thomas M. Deserno, Uniklinik RWTH Aachen (Germany) . . . . . .[9039-24]

A service protocol for post-processing of medical images on the mobile device, Longjun He, Xing Ming, Huazhong Univ. of Science and Technology (China); Lang Xu, Huazhong University of Science and Technology (China); Qian Liu, Huazhong Univ. of Science and Technology (China).[9039-25]

Teleradiology mobile internet system with a new information security solution, Hitoshi Satoh, Tokyo Health Care Univ. (Japan) . . . . . .[9039-26]

Imaging informatics based on method of MR temperature measurement in high-intensity focused ultrasound, Xiangjiao Chen, Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . . .[9039-27]

The conversion of synchrotron radiation biomedical and medical images into DICOM images, Yunling Wang, Jianyong Sun, Lab. for Medical Imaging Informatics (China); Jianqi Sun, Shanghai Jiao Tong Univ. (China); Jianguo Zhang, Lab. for Medical Imaging Informatics (China) . . . . . [9039-29]

Analysis of scalability of high-performance 3D image processing platform for virtual colonoscopy, Hiroyuki Yoshida, Massachusetts General Hospital (USA) and Harvard Medical School (USA); Yin Wu, Massachusetts General Hospital (USA); Wenli Cai, Massachusetts General Hospital (USA) and Harvard Medical School (USA) . .[9039-30]

Analysis of grid performance using an optical flow algorithm for medical image processing, Ramon A. Moreno, Instituto do Coração do Hospital das Clínicas (Brazil); Rita C. P. Cunha, Univ. Federal de São Paulo (Brazil) and Instituto do Coração do Hospital das Clínicas (Brazil); Marco A. Gutierrez, Instituto do Coração do Hospital das Clínicas (Brazil) . . . . . .[9039-31]

An Imaging informatics-based system utilizing DICOM objects for treating pain in spinal cord injury patients utilizing proton beam radiotherapy, Sneha K. Verma, Mengyi Wang, The Univ. of Southern California (USA); Sophia Chun, VA Long Beach Healthcare System (USA); Brent J. Liu, The Univ. of Southern California (USA) . . . . . .[9039-32]

Conference 9040 Posters

Ultrasonic Imaging, Tomography, and Therapy

A new radial strain and strain rate estimation method using autocorrelation for carotid artery, Jihui Ye, Hoonmin Kim, Yangmo Yoo, Sogang Univ. (Korea, Republic of); Hwan Shim, Hyungjoon Lim, Samsung Electronics Co., Ltd. (Korea, Republic of). . . . . .[9040-5]

ECG-based frame selection and curvature-based ROI detection for measuring carotid intima-media thickness, Haripriya Sharma, Ramsri G. Golla, Yu Zhang, Arizona State Univ. (USA); Christopher B. Kendall, Robert T. Hurst, Mayo Clinic Arizona (USA); Nima Tajbakhsh, Jianming Liang, Arizona State Univ. (USA) . . . . . .[9040-13]

Plane wave facing technique for ultrasonic elastography, Mingu Lee, Hwan Shim, Byeong Geun Cheon, Yunsunb Jung, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[9040-41]

Ultrasound 2D strain estimator based on non-rigid registration for ultrasound elastography, Xiaofeng Yang, Mylin Torres, Stephanie Kirkpatrick, Walter Curran, Tian Liu, Emory Univ. (USA) . . . . . .[9040-43]

Object detection in ultrasound elastography for use in HIFU treatment of cancer, Alex Huang, San José State Univ. (USA); Soumya Mankani, Anritsu Co. (USA) . . . . . .[9040-44]

Synthetic aperture elastography: a GPU based approach, Prashant Verma, Marvin M. Doyley, Univ. of Rochester (USA) . . . . . .[9040-45]

3D ultrasound Nakagami imaging for radiation-induced vaginal fibrosis, Xiaofeng Yang, Peter Rossi, Debrorah Bruner, Srini Tridandapani, Tian Liu, Emory Univ. (USA) . . . . . .[9040-46]

Quality assurance for ultrasound scanners using a durable tissue-mimicking phantom and radial MTF, Marcus Kaar, Medizinische Univ. Wien (Austria) . . . . . .[9040-47]

Feasibility of using a reliable automated Doppler flow velocity measurements for research and clinical practices, Massoud Zolgharni, Niti M. Dhutia, Graham D. Cole, Keith Willson, Darrel P. Francis, Imperial College London (UK) . . .[9040-48]

Automated measurement of fetal myocardial performance index in ultrasound Doppler waveforms, Heechul Yoon, Hyuntaek Lee, Hae-kyung Jung, Samsung Electronics Co., Ltd. (Korea, Republic of); Mi-Young Lee, Hye-Sung Won, Eun-Jin Jeon, Asan Medical Ctr. (Korea, Republic of); Eun-Ho Yang, Jin-Young Choi, Soon-Jae Hong, Samsung Electronics Co., Ltd. (Korea, Republic of); Kang-Won Jeon, Samsung Electronics Co. Ltd. (Korea, Republic of). . . . . .[9040-49]

Implementation and optimization of ultrasound signal processing algorithms on mobile GPU, Woo Kyu Kong, Wooyoul Lee, Kyu Cheol Kim, Yangmo Yoo, Tai Kyong Song, Sogang Univ. (Korea, Republic of). . . . . .[9040-51]

Automatic estimation of elasticity parameters in breast tissue, Katrin Skerl, Sandy Cochran, Andrew Evans, Univ. of Dundee (UK) . . . . . .[9040-52]

Medical ultrasound image reconstruction using compressive sampling and lp-norm minimization, Adrian Basarab, Univ. de Toulouse (France) and Institut de Recherche en Informatique de Toulouse (France) and Univ. Paul Sabatier (France); Alin M. Achim, Univ. of Bristol (UK); Denis Kouamé, Univ. de Toulouse (France) and Institut de Recherche en Informatique de Toulouse (France) and Univ. Paul Sabatier (France) . . . . . .[9040-55]

The design of split row-column addressing array for 2D transducer, Yanping Jia, Liushuai Lv, Mingyue Ding, Yuchi Ming, Huazhong Univ. of Science and Technology (China) . . . . . .[9040-56]

On the spectral response of thick piezoelectric capacitor sensors for arrays in imagenology applications, Bartolome Reyes-Ramírez, Crescencio Garcia-Segundo, Augusto García-Valenzuela, Univ. Nacional Autónoma de México (Mexico) . . . . . .[9040-57]

Simulation study of real time 3D synthetic aperture sequential beamforming for ultrasound imaging, Martin C. Hemmsen, Morten F. Rasmussen, Matthias B. Stuart, Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . .[9040-59]

Optimization of ultrasound data processing with OpenCL for portable low-cost ultrasound system, Norbert Zolek, Krzysztof M. Sielewicz, Mateusz Walczak, Marcin Lewandowski, Institute of Fundamental Technological Research (Poland). . . . . [9040-60]

Ultrasound waveform tomography with a spatially-variant regularization scheme, Youzuo Lin, Lianjie Huang, Los Alamos National Lab. (USA). . . . .[9040-61]

Real-time bent-ray breast ultrasound tomography using graphical processing units, Yassin Labyed, Lianjie Huang, Los Alamos National Lab. (USA). . . . .[9040-62]

Efficient implementation of ultrasound waveform tomography using data blending, Zhigang Zhang, Lianjie Huang, Los Alamos National Lab. (USA) .[9040-63]

Toward a practical ultrasound waveform tomography algorithm for improving breast imaging, Cuiping Li, Olivier Roy, Delphinus Medical Technologies (USA) and Wayne State Univ. (USA); Gursharan S. Sandhu, Wayne State Univ. (USA); Veerendra Allada, Delphinus Medical Technologies (USA); Steven Schmidt, Delphinus Medical Technologies (USA) and Wayne State Univ. (USA); Neb Duric, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA) [9040-64]

Investigation of adjoint-state method for ultrasound tomography that eliminates the need for ray-tracing, Fatima Anis, Yang Lou, Mark A. Anastasio, Washington Univ. in St. Louis (USA) . . . . . [9040-65]

Segmentation of 3D ultrasound computer tomography reflection images using edge detection and surface fitting, Torsten Hopp, Michael Zapf, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany). . . . . [9040-66]

Intense acoustic burst ultrasound modulated optical tomography for elasticity mapping of soft biological tissue mimicking phantom: a laser speckle contrast analysis study, Mayanglambam S. Singh, Rajan Kanhirodan, Ram Vasu, Indian Institute of Science (India) . . . . . [9040-67]

Born-ratio type data normalization improves quantitation in photoacoustic tomography, Mayanglambam S. Singh, Phaneendra K. Yalavarthy, Indian Institute of Science (India) . . . . . [9040-68]

Multiwavelength photoacoustic microscopy using a custom developed supercontinuum fiber laser, Esra Aytac-Kipergil, Hakan Erkol, Bogaziçi Üniv. (Turkey); Seydi Yavas, Bilkent Univ. (Turkey); Aytac Demirkiran, Nasire Uluc, Mehmet Burcin Unlu, Bogaziçi Üniv. (Turkey) . . . . . [9040-69]

A study on the real-time photoacoustic tomography system for functional imaging and the monitoring of the rat's kidney inflammation, Dong Ho Shin, Sang Hun Park, Chonbuk National Univ. (Korea, Republic of); M.Y. Lee, W.C Ham, H.K Paik, Chonbuk National Univ (Korea, Republic of); Chul-Gyu Song, Chonbuk National Univ. (Korea, Republic of). . . . . .[9040-70]

Software Framework for spatially-tracked pre-beamformed RF data acquisition with a freehand clinical 2D ultrasound transducer, Hyun Jae Kang, Xiaoyu Guo, Alexis Cheng, Emad M. Boctor, Johns Hopkins Univ. (USA) . . . . . .[9040-71]

Enabling technologies for robot assisted ultrasound tomography: ultrasound calibration, Fereshteh Aalamifar, Rishabh Khurana, Alexis Cheng, Russell H. Taylor, Iulian I. Iordachita, Emad M. Boctor, Johns Hopkins Univ. (USA) . . . . . .[9040-72]

GPU implementation of transverse oscillation three-dimensional velocity vector imaging, David P. Bradway, Michael J. Pihl, Andreas Krebs, Borislav G. Tomov, Matthias B. Stuart, Technical Univ. of Denmark (Denmark); Peter M. Hansen, Michael B. Nielsen, Copenhagen Univ. Hospital Rigshopitalet (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . .[9040-73]

Assessment of aortic pulse wave velocity by ultrasound: a feasibility study in mice, Francesco Faita, Nicole Di Lascio, Francesco Stea, Claudia Kusmic, Rosa Sicari, Consiglio Nazionale delle Ricerche (Italy) . . . . . .[9040-75]

The effects of probe placement on measured flow velocity in transcranial Doppler ultrasound imaging in vitro and in vivo experiments, Daan L. K. de Jong, Aisha S. S. Meel-van den Abeelen, Joep Lagro, Jurgen Claassen, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Cornelis H. Slump, Univ. Twente (Netherlands) . . . . . .[9040-76]

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

Tomosynthesis

Session Chairs: **John M. Sabol,** GE Healthcare (USA); **Anders Tingberg,** Lund Univ. (Sweden)

8:00 am: **Evaluation of low contrast detectability after scatter correction in digital breast tomosynthesis**, Koen Michielsen, Katholieke Univ. Leuven (Belgium); Andreas Fieselmann, Siemens Healthcare (Germany); Lesley Cockmartin, Johan Nuyts, Katholieke Univ. Leuven (Belgium) . . . . . .[9033-37]

8:20 am: **An experimental study of practical computerized scatter correction methods for prototype digital breast tomosynthesis**, Ye-Seul Kim, Hye-Suk Park, Hee-Joung Kim, Haeng-hwa Lee, Yonsei Univ. (Korea, Republic of); Young-Wook Choi, JaeGu Choi, Korea Electrotechnology Research Institute (Korea, Republic of) . . . .[9033-38]

8:40 am: **Optimizing the acquisition geometry for digital breast tomosynthesis using the Defrise phantom**, Raymond J. Acciavatti, Alice Chang, Laura Woodbridge, Andrew D. A. Maidment, The Univ. of Pennsylvania Health System (USA) . . . . . .[9033-39]

9:00 am: **Increased microcalcification visibility in lumpectomy specimens using a stationary digital breast tomosynthesis system**, Andrew W. Tucker, Yueh Z. Lee, Cherie M. Kuzmiak, Jabari Calliste, Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . . .[9033-40]

9:20 am: **Evaluation of imaging geometry for stationary chest tomosynthesis**, Jing Shan, Andrew W. Tucker, The Univ. of North Carolina at Chapel Hill (USA); Yueh Z. Lee, The Univ. of North Carolina School of Medicine (USA); Michael D. Heath, Xiaohui Wang, David H. Foos, Carestream Health, Inc. (USA); Jianping Lu, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . . .[9033-41]

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

9033 continues on page 49

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

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

Keynote

Joint Session with Conferences 9035 and 9039

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

8:00 am: **Opportunities and challenges for diagnostic decision support systems** *(Keynote Presentation)*, Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . .[9035-16]

8:45 am: **Re-thinking CAD for the future: a clinical perspective** *(Keynote Presentation)*, Eliot L. Siegel, Univ. of Maryland Medical Ctr. (USA) . . . . . .[9039-1]

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

9035 continues on page 49

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 5
Room: California . . . Wed 8:00 am to 9:20 am

Segmentation

Session Chairs: **Alexandre X. Falcão,** Univ. Estadual de Campinas (Brazil); **Purang Abolmaesumi,** The Univ. of British Columbia (Canada)

8:00 am: **Surgical screw segmentation for mobile C-arm CT devices**, Joseph Görres, Michael Brehler, Deutsches Krebsforschungszentrum (Germany); Jochen Franke, BG Unfallklinik (Germany); Ivo Wolf, Hochschule Mannheim (Germany); Sven Y. Vetter, Paul A. Gruetzner, BG Unfallklinik (Germany); Hans-Peter Meinzer, Diana Wald, Deutsches Krebsforschungszentrum (Germany) . . . . . .[9036-21]

8:20 am: **Prostate zonal segmentation on multi-parametric MRIs using Gaussian mixture model**, Yanling Chi, Qi Tian, Singapore Bioimaging Consortium (Singapore); Henry Ho, Yan Mee Law, Singapore General Hospital (Singapore); Hongjun Chen, Biobot Surgical Pte. Ltd. (Singapore); Kae Jack Tay, Singapore General Hospital (Singapore); Jimin Liu, Singapore Bioimaging Consortium (Singapore) . . . . . .[9036-22]

8:40 am: **Segmentation of risk structures for otologic surgery using the probabilistic active shape model**, Meike Becker, Matthias Kirschner, Georgios Sakas, Technische Univ. Darmstadt (Germany) . . . . . .[9036-23]

9:00 am: **Semi-automatic segmentation of vertebral bodies in volumetric MR images using a statistical shape+pose model**, Amin Suzani, Abtin Rasoulian, Sidney Fels, Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . .[9036-24]

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

9036 continues on page 49

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Golden West

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

NOTE ROOM CHANGE

Keynote

Joint Session with Conferences 9035 and 9039

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

8:00 am: **Opportunities and challenges for diagnostic decision support systems** *(Keynote Presentation)*, Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . .[9035-16]

8:45 am: **Re-thinking CAD for the future: a clinical perspective** *(Keynote Presentation)*, Eliot L. Siegel, Univ. of Maryland Medical Ctr. (USA) . . . . . .[9039-1]

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

9039 continues on page 49

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

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

Ultrasound Elastography

Joint Session with Conferences 9038 and 9040

Session Chairs: **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA); **Marvin M. Doyley,** Univ. of Rochester (USA)

8:00 am: **A feasibility study of ultrasound B-mode and strain image for risk assessment of carotid atherosclerotic plaques validated by magnetic resonance imaging**, Xiaochang Pan, Tsinghua Univ. (China); Lingyun Huang, Philips Research (China); Manwei Huang, China Meitan General Hospital (China); Xihai Zhao, Le He, Tsinghua Univ. (China); Chun Yuan, Tsinghua Univ. (China) and Univ. of Washington (USA); Jing Bai, Jianwen Luo, Tsinghua Univ. (China) . . . . . .[9040-1]

8:20 am: **Vibro-elastoraphy: direct FEM inversion of the shear wave equation without the local homogeneity assumption**, Mohammad Honarvar, Septimiu E. Salcudean, Robert N. Rohling, The Univ. of British Columbia (Canada) . . . . . .[9040-2]

8:40 am: **Prostate clinical study of a full inversion unconstrained ultrasound elastography technique**, Seyed Reza Mousavi, Western Univ. Canada (Canada); Ali Sadeghi-Naini, Gregory J. Czarnota, Sunnybrook Health Sciences Ctr. (Canada); Abbas Samani, Western Univ. Canada (Canada) . . . . . .[9040-3]

9:00 am: **Improved apparatus for predictive diagnosis of rotator cuff disease**, Anup Pillai, Clemson Univ. (USA); Charles A. Thigpen, Proaxis Therapy (USA); Brittany Nicole Hall, David M. Kwartowitz, Clemson Univ. (USA) .[9040-4]

9:20 am: **Characterization of the elasticity of embedded objects' in tissue mimicking phantoms using ultrasound-stimulated vibro-acoustography (USVA)**, Ashkan Maccabi, Univ. of California, Los Angeles (USA) . . . . . .[9040-42]

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

9040 continues on page 49

Wednesday · 19 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

Multi-energy CT

Session Chairs: **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden); **Taly G. Schmidt,** Marquette Univ. (USA)

10:10 am: **CT calibration and dose minimization in image-based material decomposition with energy-selective detectors**, Sebastian Faby, Stefan Kuchenbecker, David Simons, Heinz-Peter Schlemmer, Deutsches Krebsforschungszentrum (Germany); Michael Lell, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany). . . . .[9033-42]

10:30 am: **Segmented targeted least squares estimator for material decomposition in multi bin PCXDs**, Paurakh L. Rajbhandary, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA). . . . . .[9033-43]

10:50 am: **Pooling optimal combinations of energy thresholds in spectroscopic CT**, Thomas Koenig, Marcus Zuber, Elias Hamann, Karlsruher Institut für Technologie (Germany); Michael Fiederle, Freiburger Materialforschungszentrum (Germany); Tilo Baumbach, Karlsruher Institut für Technologie (Germany). . . . . .[9033-44]

11:10 am: **Effects of energy-bin acquisition methods on noise properties in photon-counting spectral CT**, Taly Gilat-Schmidt, Kevin C. Zimmerman, Marquette Univ. (USA); Emil Y. Sidky, The Univ. of Chicago (USA). . . . . .[9033-45]

11:30 am: **Photon counting CT at elevated X-ray tube currents: contrast stability, image noise and multi-energy performance**, Steffen G. Kappler, Andre Henning, Bjoern Kreisler, Friederike Schöck, Karl Stierstorfer, Thomas G. Flohr, Siemens AG (Germany) . . . . . .[9033-46]

11:50 am: **Direct spectral recovery using X-ray fluorescence measurements for material decomposition applications of photon counting spectral X-ray detectors**, Tom Campbell-Ricketts, Mini Das, Univ. of Houston (USA). . . . . .[9033-47]

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

9033 continues on page 50

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

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

Lung, Chest, and Abdomen I

Session Chairs: **Nicholas A. Petrick,** U.S. Food and Drug Administration (USA); **Jong Hyo Kim,** Seoul National Univ. College of Medicine (Korea, Republic of)

10:10 am: **Detection, modeling and matching of pleural thickenings from CT data towards an early diagnosis of malignant pleural mesothelioma**, Kraisorn Chaisaowong, RWTH Aachen (Germany); Thomas Kraus, Univ. Hospital Aachen (Germany) . . . . . .[9035-17]

10:30 am: **Automatic localization of IASLC-defined mediastinal lymph node stations on CT images using fuzzy models**, Monica M. S. Matsumoto, Jayaram K. Udupa, Steven Archer, Drew A. Torigian, Univ. of Pennsylvania (USA) . . . . . .[9035-18]

10:50 am: **Computer detection system for malpositioned endotracheal tubes**, Zhimin Huo, Jing Zhang, Carestream Health, Inc. (USA); Hongda Mao, Rochester Institute of Technology (USA); Anne-Marie Sykes, Mayo Clinic (USA); John Wandtke, Univ. of Rochester (USA); David H. Foos, Carestream Health, Inc. (USA) . . . . . .[9035-19]

11:10 am: **Artificial neural networks for automatic modelling of the pectus excavatum corrective prosthesis** , Pedro L. Rodrigues, António H. J. Moreira, Univ. do Minho (Portugal); Nuno F. Rodrigues, Univ. do Minho (Portugal) and Instituto Politecnico do Cavado e do Ave (Portugal); Antonio C. M. Pinho, Jaime C. Fonseca, Jorge Correia-Pinto, Univ. do Minho (Portugal); João L. Vilaça, Univ. do Minho (Portugal) and Instituto Politecnico do Cavado e do Ave (Portugal) . . . . .[9035-20]

11:30 am: **Mediastinal lymph node detection on thoracic CT scans using spatial prior from multi-atlas label fusion**, Jiamin Liu, Jocelyn Zhao, Joanne Hoffman, Jianhua Yao, Weidong Zhang, Evrim B. Turkbey, Shijun Wang, Christine Kim, Ronald M. Summers, National Institutes of Health (USA). . . . . .[9035-21]

11:50 am: **Estimation of cartilaginous region in noncontrast CT of the chest**, Qian Zhao, Nabile M. Safdar, Children's National Medical Ctr. (USA); Glenna Yu, Children's National Medical Ctr. (USA) and Princeton Univ. (USA); Emmarie Myers, Anthony Sandler, Marius George Linguraru, Children's National Medical Ctr. (USA). . . . . .[9035-22]

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

9035 continues on page 50

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

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

Registration

Session Chairs: **Steven L. Hartmann,** Medtronic Navigation (USA); **Lena Maier-Hein,** Deutsches Krebsforschungszentrum (Germany)

10:10 am: **Piecewise-rigid 2D-3D registration for pose estimation of snake-like manipulator using an intraoperative X-ray projection**, Yoshito Otake, Johns Hopkins Univ. (USA); Ryan J. Murphy, Michael D. Kutzer, Johns Hopkins Univ. (USA); Armand Mehran, Johns Hopkins Univ. Applied Physics Lab. (USA) . . . . . .[9036-26]

10:30 am: **Deformable registration for image-guided spine surgery: preserving rigid body vertebral morphology in free-form transformations**, Sureerat Reaungamornrat, Ali Uneri, Yoshito Otake, Zhe Zhao, Adam S. Wang, Akhil J. Khanna, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . .[9036-27]

10:50 am: **Hyperspectral imaging for surgical margin delineation of head and neck cancer: registration of hyperspectral and histological images**, Guolan Lu, Emory Univ. (USA) and Georgia Insitute of Technology (USA); Luma V. Halig, Dongsheng Wang, Zhuo Georgia Chen, Emory Univ. (USA); Baowei Fei, Emory Univ. (USA) and Georgia Institute of Technology (USA) . . . . . .[9036-28]

11:10 am: **Dynamic tracking of a deformable tissue based on 3D-2D MR-US image registration**, Bahram Marami, McMaster Univ. (Canada) and Robarts Research Institute (Canada); Shahin Sirouspour, McMaster Univ. (Canada); Aaron Fenster, Robarts Research Institute (Canada); David W. Capson, Univ. of Victoria (Canada). . . . . .[9036-29]

11:30 am: **Target registration error for rigid shape-based registration with heteroscedastic noise**, Burton Ma, Joy Choi, Hong M. Huai, York Univ. (Canada). . . . . .[9036-30]

11:50 am: **Registration of liver images to minimally invasive intraoperative surface and subsurface data**, Yifei Wu, Vanderbilt Univ. (USA); Daniel C. Rucker, Vanderbilt Univ. (USA) and The Univ. of Tennessee Knoxville (USA); Rebekah H. Conley, Thomas S. Pheiffer, Amber L. Simpson, Vanderbilt Univ. (USA); Sunil K. Geevarghese, Vanderbilt Univ. Medical Ctr. (USA) and Vanderbilt Univ. School of Medicine (USA); Michael I. Miga, Vanderbilt Univ. (USA). . . . . .[9036-31]

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

9036 continues on page 50

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

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

Beyond PACS: Advanced Radiology Workflow

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

10:10 am: **Development of a web-based DICOM-SR viewer for CAD data of multiple sclerosis lesions in an imaging informatics-based eFolder**, Kevin C. Ma, Heng Gao Zhong, Jonathan Wong, Jeffrey Zhang, Brent J. Liu, The Univ. of Southern California (USA) . . . . . .[9039-2]

10:30 am: **Remote volume rendering pipeline for mHealth applications**, Ievgeniia Gutenko, Xin Zhao, Ji Hwan Park, Kaloian Petkov, Charilaos Papadopoulos, Arie Kaufman, Stony Brook Univ. (USA); Ronald Cha, Samsung Research America (USA). . . . . .[9039-3]

10:50 am: **Separation of metadata and pixel data to speed DICOM tag morphing**, Mahmoud M. Ismail, James F. Philbin, Johns Hopkins Outpatient Ctr. (USA). . . . . .[9039-4]

11:10 am: **The oncology medical image database (OMI-DB)**, Mark D. Halling-Brown, Padraig T. Looney, Mishal N. Patel, Lucy M. Warren, Alistair Mackenzie, Kenneth C. Young, The Royal Surrey County Hospital NHS Trust (UK) . .[9039-5]

11:30 am: **A concept of a generalized electronic patient record for personalized medicine**, Jens Meier, Univ. Leipzig (Germany); Ruchi R. Deshpande, Brent J. Liu, Image Processing and Informatics Lab. (USA); Thomas Neumuth, Univ. Leipzig (Germany) . . . . . .[9039-6]

11:50 am: **Biomedical image representation and classification using an enntropy weighted probabilistic concept feature space**, Mahmudur Rahman, Sameer Antani, Dina Demner-Fushman, George R. Thoma, National Library of Medicine (USA)[9039-7]

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

9039 continues on page 50

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

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

Keynote and Acoustic Microscopy and Tissue Characterization

Session Chair: **Neb Duric,** Delphinus Medical Technologies (USA)

10:10 am: **Advances in acoustic microscopy and high resolution ultrasonic imaging: from principles to new applications** *(Keynote Presentation)*, Roman G. Maev, Univ. of Windsor (Canada). . . . . .[9040-6]

10:50 am: **Lesion detectability in automated breast ultrasound**, Sara Bahramian, Univ. of Illinois at Urbana-Champaign (USA); Keith A. Wear, U.S. Food and Drug Administration (USA). . . . . .[9040-54]

11:10 am: **Quantitative ultrasound monitoring of breast tumor response to chemotherapy by analysis of frequency-dependent attenuation and backscattered power**, Hadi Tadayyon, Lakshmanan Sannachi, Gregory J. Czarnota, Univ. of Toronto (Canada) . . . . . .[9040-8]

11:30 am: **Computed ultrasound tomography in echo mode (CUTE) for imaging speed of sound using pulse-echo sonography: proof of principle**, Michael Jaeger, Martin Frenz, Univ. Bern (Switzerland). . . . . .[9040-9]

11:50 am: **Dynamic subnanosecond time-of-flight detection for ultra-precise diffusion monitoring and optimization of biomarker preservation**, Daniel R. Bauer, Benjamin Stevens, Jefferson Taft, David Chafin, Michael Otter, Ventana Medical Systems, Inc. (USA). . . . . .[9040-10]

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

9040 continues on page 50

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

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

Multi-energy Imaging and Detectors

Session Chairs: **John A. Rowlands,** Thunder Bay Regional Research Institute (Canada); **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA)

1:20 pm: **Energy weighting improves the image quality of spectral mammograms: implementation on a photon-counting mammography system**, Johan Berglund, Henrik Johansson, Philips Home Healthcare Solutions (Sweden); Hanns-Ingo Maack, Philips GmbH Healthcare (Germany); Erik Fredenberg, Philips Home Healthcare Solutions (Sweden). . . . . .[9033-48]

1:40 pm: **Spectral lesion characterization on a photon-counting mammography system**, Klaus Erhard, Philips Research (Germany); Erik Fredenberg, Philips Healthcare (Sweden); Hanno Homann, Ewald Roessl, Philips Research (Germany). . . . . .[9033-49]

2:00 pm: **Amorphous selenium direct detection CMOS digital x-ray imager with 25 micron pixel pitch**, Christopher C. Scott, Shiva Abbaszadeh, Sina Ghanbarzadeh, Univ. of Waterloo (Canada); Gary Allan, Michael Farrier, Teledyne DALSA (Canada); Karim S. Karim, Univ. of Waterloo (Canada) . . . . . .[9033-50]

2:20 pm: **Reflection properties of scintillator-septum candidates for a pixelated MeV detector**, Mihye Shin, Stanford Univ. (USA); Josh M. Star-Lack, Varian Medical Systems, Inc. (USA); Martin Janecek, Lawrence Berkeley National Lab. (USA); Eric Abel, Daniel Shedlock, Varian Medical Systems, Inc. (USA); Rebecca Fahrig, Stanford Univ. (USA) . . . .[9033-51]

2:40 pm: **Initial steps toward the realization of large area arrays of single photon counting pixels based on polycrystalline silicon TFTs**, Albert K. Liang, Martin Koniczek, Larry E. Antonuk, Youcef El-Mohri, Qihua Zhao, Hao Jiang, Univ. of Michigan (USA) . . . . . .[9033-52]

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

9033 continues on page 51

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 7
Room: Golden West . . . . Wed 1:20 to 3:00 pm

Vessels, Heart, and Eye II

Session Chairs: **Marleen de Bruijne,** Erasmus MC (Netherlands); **Clarisa Sánchez,** Radboud Univ. Njimegan Medical Ctr. (Netherlands)

1:20 pm: **A joint estimation detection of Glaucoma progression in 3D spectral domain optical coherence tomography optic nerve head images**, Akram Belghith, Christopher Bowd, Robert N. Weinreb, Linda M. Zangwill, Univ. of California, San Diego (USA) . . . . [9035-113]

1:40 pm: **Automated aortic calcification detection in low-dose chest CT images**, Yiting Xie, Cornell Univ. (USA); Yu Maw Htwe, Icahn School of Medicine at Mount Sinai (USA); Jennifer Padgett, Cornell Univ. (USA); Claudia I. Henschke, David F. Yankelevitz, Icahn School of Medicine at Mount Sinai (USA); Anthony P. Reeves, Cornell Univ. (USA) . . . . . .[9035-24]

2:00 pm: **Segmentation and separation of venous vasculatures in liver CT images**, Lei Wang, Christian Hansen, Stephan Zidowitz, Horst K. Hahn, Fraunhofer MEVIS (Germany). . . .[9035-25]

2:20 pm: **Computerized luminal analysis for detection of non-calcified plaques in coronary CT angiography**, Jun Wei, Chuan Zhou, Heang-Ping Chan, Aamer R. Chughtai, Smita Patel, Prachi Agarwal, Jean W. Kuriakose, Lubomir M. Hadjiiski, Ella A. Kazerooni, Univ. of Michigan Health System (USA) . . . . . .[9035-26]

2:40 pm: **Automated discovery of structural features of the optic nerve head on the basis of image and genetic data**, Mark A. Christopher, Li Tang, John H. Fingert, Todd E. Scheetz, Michael D. Abràmoff, The Univ. of Iowa (USA) . . . . . .[9035-27]

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

9035 continues on page 51

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 7
Room: California . . . . . Wed 1:20 to 3:00 pm

Keynote and Bench to Bedside

Session Chairs: **David R. Holmes III,** Mayo Clinic (USA); **Ziv R. Yaniv,** Children's National Medical Ctr. (USA)

1:20 pm: **Engineering therapeutic processes: from research to commodity** *(Keynote Presentation)*, Robert L. Galloway Jr., Vanderbilt Univ. (USA). . . . . [9036-32]

2:20 pm: **Integration and visualization of intraoperative stereovision imaging for brain shift compensation during image-guided cranial procedures**, Timothy J. Schaewe, Medtronic, Inc. (USA); Xiaoyao Fan, Songbai Ji, Thayer School of Engineering at Dartmouth (USA); David W. Roberts, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA); David Simon, Medtronic, Inc. (USA). . . .[9036-33]

2:40 pm: **Stereoscopic augmented reality using ultrasound volume rendering for laparoscopic surgery in children**, Jihun Oh, Xin Kang, Emmanuel Wilson, Craig A. Peters, Timothy D. Kane, Raj Shekhar, Children's National Medical Ctr. (USA) . . . . . .[9036-34]

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

9036 continues on page 51

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

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

Medical Image Sharing and Exchange

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

1:20 pm: **OC To-go: on patient's site integration of images into OpenClinica in clinical trials by mobile devices**, Daniel Haak, Stephan Jonas, Johan Gehlen, Thomas M. Deserno, RWTH Aachen (Germany) . . . . . .[9039-8]

1:40 pm: **New approach on secured image distribution**, Andreas Thiel, OFFIS e.V. (Germany). . . . . .[9039-9]

2:00 pm: **Medical imaging document sharing solutions for various healthcare services based on IHE XDS/XDS-I profiles**, Jianguo Zhang, Yuanyuan Yang, Kai Zhang, Jianyong Sun, Tongue Ling, Shanghai Institute of Technical Physics (China); Peter R. Bak, McMaster Univ. (Canada) . . . . . .[9039-10]

2:20 pm: **Automated collection of medical images for research from heterogeneous systems: trials and tribulations**, Mishal N. Patel, Padraig T. Looney, Kenneth C. Young, Mark D. Halling-Brown, The Royal Surrey County Hospital NHS Trust (UK). . . . . .[9039-28]

2:40 pm: **An OsiriX plugin for integrated cardiac image processing research**, Markus Huellebrand, Anja B. Hennemuth, Fraunhofer MEVIS (Germany); Daniel Messroghli, Titus Kühne, Deutsches Herzzentrum Berlin (Germany). . .[9039-12]

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

9039 continues on page 51

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

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

Ultrasound Image Analysis

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

1:20 pm: **Software phantom with realistic speckle modeling for validation of image analysis methods in echocardiography**, Yuen C. Law, RWTH Aachen (Germany); Daniel Tenbrinck, Xiaoyi Jiang, Westfälische Wilhelms-Univ. Münster (Germany); Torsten Kuhlen, RWTH Aachen (Germany) . . . . . .[9040-11]

1:40 pm: **Breast boundary detection with active contours**, Ivana Balic, Pulkit Goyal, SonoView Acoustic Sensing Technologies (Switzerland); Olivier Roy, Neb Duric, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA). . . . . .[9040-12]

2:00 pm: **Minimum variance image blending for robust ultrasound image deconvolution**, Sungchan Park, Samsung Electronics Co., Ltd. (Korea, Republic of). . . . . .[9040-58]

2:20 pm: **A comparison of region-based and pixel-based CEUS kinetics parameters in the assessment of arthritis**, Enrico Grisan, Univ. degli Studi di Padova (Italy); Bernd Raffeiner, Univ. degli Studi di Padova (Italy) and General Hospital of Bolzano (Italy); Alessandro Coran, Univ. degli Studi di Padova (Italy); Gaia Rizzo, University of Padova (Italy); Luca Ciprian, Giovanni XXIII (Italy); Roberto Stramare, Univ. degli Studi di Padova (Italy) . . . . . .[9040-14]

2:40 pm: **Calibration of echocardiographic tissue Doppler velocity, using simple, universally-applicable methods**, Niti M. Dhutia, Massoud Zolgharni, Keith Willson, Graham D. Cole, Alexandra N. Nowbar, Charlotte H. Manisty, Darrel P. Francis, Imperial College London (UK) . . . . . .[9040-15]

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

9040 continues on page 51

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 11
Room: Town & Country . Wed 3:30 to 5:30 pm

New Contrast Mechanisms
Session Chairs: **Norbert J. Pelc,** Stanford Univ. (USA); **Maria Drangova,** Robarts Research Institute (Canada)

3:30 pm: **X-ray fluorescence molecular imaging of high-Z tracers: investigation of a novel analyzer based setup**, Bernhard H. Müller, Ludwig-Maximilians-Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany); Florian J. Grüner, Univ. Hamburg (Germany); Thorsten R. Johnson, Ludwig-Maximilians-Univ. München (Germany) . . . . . .[9033-53]

3:50 pm: **Monte Carlo simulations of dose enhancement around gold nanoparticles used as X-ray imaging contrast agents and radio sensitizers**, Weibo Li, Marie Müllner, Matthias B. Greiter, Helmholtz Zentrum München GmbH (Germany); Caroline Bissardon, Helmholtz Zentrum München GmbH (Germany) and Univ. Claude Bernard Lyon 1 (France); Wenzhang Xie, Helmholtz Zentrum München GmbH (Germany) and Tsinghua Univ. (China); Helmut Schlatll, Uwe Oeh, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany) . . . . . .[9033-54]

4:10 pm: **Small-animal microangiography using phase-contrast X-ray imaging and gas as contrast agent**, Ulf Lundström, Daniel H. Larsson, KTH Royal Institute of Technology (Sweden); Ulrica K. Westermark, Karolinska Institutet (Sweden); Anna Burvall, Hans M. Hertz, KTH Royal Institute of Technology (Sweden) . . . . . .[9033-55]

9033 continues on page 52

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 8
Room: Golden West . . . . Wed 3:30 to 5:30 pm

Breast I
Session Chairs: **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA); **Georgia D. Tourassi,** Oak Ridge National Lab. (USA)

3:30 pm: **Using undiagnosed data to enhance computerized breast cancer analysis with a three stage data labeling method**, Wenqing Sun, Tzu-Liang B. Tseng, Sergio D. Cabrera, Jianying Zhang, Miguel Vélez-Reyesv, Wei Qian, The Univ. of Texas at El Paso (USA) . . . . . .[9035-28]

3:50 pm: **A method for simultaneous detection, segmentation and classification of lesions in breast ultrasound images by learning with exemplars**, Lidan Zhang, Haibing Ren, Zhihua Liu, Chuan Zhao, YongNan Ji, Samsung Advanced Institute of Technology (China) . . . . . .[9035-29]

4:10 pm: **Tumor detection in 3D ultrasound using phase-based features and Haar-like features**, Chuan Zhao, Haibing Ren, YongNan Ji, Lidan Zhang, Zhihua Liu, Hongwei Zhang, Samsung Advanced Institute of Technology (China) . . . . . .[9035-30]

4:30 pm: **Fully automated segmentation of whole breast in MR images by use of dynamic programming**, Luan Jiang, Yanyun Lian, Shanghai Advanced Research Institute (China); Yajia Gu, Xiaoxin Hu, Fudan Univ. Shanghai Cancer Ctr. (China); Qiang Li, Shanghai Advanced Research Institute (China) . . . . . .[9035-31]

4:50 pm: **Sparse representation of multi parametric DCE-MRI features using K-SVD for classifying gene expression based breast cancer recurrence risk**, Majid Mahrooghy, Ahmed B. Ashraf, Dania Daye, Carolyn Mies, Michael D. Feldman, Mark Alan Rosen, Despina Kontos, Univ. of Pennsylvania (USA) . . . . . .[9035-32]

5:10 pm: **Digital breast tomosynthesis: effects of projection-view distribution on computer-aided detection of microcalcification clusters**, Ravi K. Samala, Heang-Ping Chan, Yao Lu, Lubomir M. Hadjiiski, Jun Wei, Mark A. Helvie, Univ. of Michigan Health System (USA) . . . . . .[9035-33]

9035 continues on page 53

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 8
Room: California . . . . . Wed 3:30 to 5:30 pm

Robotics and Tracking
Session Chairs: **David M Kwartowitz,** Clemson Univ. (USA); **Robert J. Webster III,** Vanderbilt Univ. (USA)

3:30 pm: **Localization accuracy of sphere fiducials in computed tomography images**, Jan-Philipp Kobler, Jesús Díaz Díaz, Leibniz Univ. Hannover (Germany); J. Michael Fitzpatrick, Vanderbilt Univ. (USA); G. Jakob Lexow, Omid Majdani, Medizinische Hochschule Hannover (Germany); Tobias Ortmaier, Leibniz Univ. Hannover (Germany) . . . . . [9036-35]

3:50 pm: **On the accuracy of a video-based drill-guidance solution for orthopedic and trauma surgery: preliminary results**, Jessica Magaraggia, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Gerhard Kleinszig, Wei Wei, Markus Weiten, Rainer Graumann, Siemens AG (Germany); Elli Angelopoulou, Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . . .[9036-36]

4:10 pm: **In vivo reproducibility of robotic probe placement for an integrated US-CT image-guided radiotherapy system**, Muyinatu A. Lediju Bell, H. Tutkun Sen, Iulian I. Iordachita, Peter Kazanzides, John Wong, Johns Hopkins Univ. (USA) . . . . . .[9036-37]

4:30 pm: **Workflow assessment of 3T MRI-guided transperineal targeted prostate biopsy using a robotic needle guidance**, Sang-Eun Song, Kemal Tuncali, Junichi Tokuda, Andriy Fedorov, Brigham and Women's Hospital (USA); Tobias Penzkofer, Brigham and Women's Hospital (USA) and Univ. Hospital Aachen (Germany); Fiona Fennessy, Clare Tempany, Brigham and Women's Hospital (USA); Kitaro Yoshimitsu, Brigham and Women's Hospital (USA) and Tokyo Women's Medical Univ. (Japan); John Magill, Physical Sciences Inc. (USA); Nobuhiko Hata, Brigham and Women's Hospital (USA) . . . . . .[9036-38]

9036 continues on page 52

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

SESSION 4
Room: Royal Palm One . Wed 3:30 to 5:30 pm

Diagnostics and Therapeutic Applications of Imaging Informatics
Session Chair: **Thomas M. Deserno,** RWTH Aachen (Germany)

3:30 pm: **A web-based neurological pain classifier tool utilizing Bayesian decision theory for pain classification in spinal cord injury patients**, Sneha K. Verma, Mengyi Wang, The Univ. of Southern California (USA); Sophia Chun, VA Long Beach Healthcare System (USA); Brent J. Liu, The Univ. of Southern California (USA) . . . . . .[9039-13]

3:50 pm: **Wearable technology as a booster of clinical care**, Stephan Jonas, Andreas Hannig, Cord Spreckelsen, Thomas M. Deserno, Uniklinik RWTH Aachen (Germany) . . . . . .[9039-14]

4:10 pm: **Development of a user customizable imaging informatics-based intelligent workflow engine system to enhance rehabilitation clinical trials**, Ximing Wang, Clarisa Martinez, Jing Wang, Ye Liu, Brent J. Liu, The Univ. of Southern California (USA) . . . . . .[9039-15]

4:30 pm: **Mapping of ApoE4 related white matter damage using diffusion MRI**, Sinchai Tsao, Darryl Hwa Hwang, Niharika Gajawelli, The Univ. of Southern California (USA); Stephen Kriger, San Francisco V. A. Medical Ctr. (USA); Meng Law, Helena C. Chui, The Univ. of Southern California (USA); Michael W. Weiner, San Francisco V. A. Medical Ctr. (USA); Natasha Lepore, The Univ. of Southern California (USA) . . . . . .[9039-16]

4:50 pm: **The power of hybrid / fusion imaging metrics in future PACS systems: a case study into the white matter hyperintensity prenumbra using FLAIR and diffusion MR**, Sinchai Tsao, Samantha J. Ma, Peter A. Michels, Niharika Gajawelli, The Univ. of Southern California (USA) and Children's Hospital Los Angeles (USA); Meng Law, Helena C. Chui, The Univ. of Southern California (USA); Natasha Lepore, The Univ. of Southern California (USA) and Children's Hospital Los Angeles (USA) . . . . . .[9039-17]

9039 continues on page 52

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 4
Room: San Diego . . . . . Wed 3:30 to 5:30 pm

Transducers and Beamforming
Session Chair: **Bae-Hyung Kim,** Samsung Advanced Institute of Technology (Korea, Republic of)

3:30 pm: **Design and fabrication of a low-frequency (1-3 MHz) ultrasound transducer for accurate placement of screw implants in the spine**, Amir Manbachi, Univ. of Toronto (Canada); Mike Lee, F. Stuart Foster, Sunnybrook Research Institute (Canada); Howard J. Ginsberg, St. Michael's Hospital (Canada); Richard S. C. Cobbold, Univ. of Toronto (Canada) . . . . . .[9040-16]

3:50 pm: **A synthetic transmit aperture imaging technique using orthogonally band-divided signals to utilize wide bandwidth property of CMUT arrays**, Bae-Hyung Kim, Suhyun Park, Kyuhong Kim, Taeho Jeon, Seungheun Lee, Youngil Kim, Kyungil Cho, Jongkeun Song, Samsung Advanced Institute of Technology (Korea, Republic of) . [9040-17]

4:10 pm: **A preliminary work on pre-beamformed data acquisition system for ultrasound imaging with 2D transducer**, Xu Li, Huazhong Univ. of Science and Technology (China) . [9040-18]

4:30 pm: **Hybrid beamformer architecture to minimize volumetric ultrasound imaging scanners using 2D CMUT-on-ASIC arrays**, Bae-Hyung Kim, Taeho Jeon, Jongkeun Song, Seungheun Lee, Suhyun Park, Kyuhong Kim, Youngil Kim, Kyungil Cho, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . .[9040-19]

4:50 pm: **A comparison between temporal and subband minimum variance adaptive beamforming**, Konstantinos Diamantis, Heriot-Watt Univ. (UK); Iben K. Holfort-Voxen, Technical Univ. of Denmark (Denmark); Alan H. Greenaway, Heriot-Watt Univ. (UK); Tom H. Anderson, The Univ. of Edinburgh (UK); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark); Vassilis Sboros, Heriot-Watt Univ. (UK) . . . . . .[9040-20]

9040 continues on page 52

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 11 (CONTINUED)
Room: Town & Country . Wed 3:30 to 5:30 pm

4:30 pm: **Small-animal dark-field radiography for pulmonary emphysema evaluation**, Andre Yaroshenko, Technische Univ. München (Germany); Felix G. Meinel, Katharina Hellbach, Ludwig-Maximilians-Univ. Hospital München (Germany); Martin Bech, Technische Univ. München (Germany) and Lund Univ., Medical Radiation Physics (Sweden); Astrid Velroyen, Mark Müller, Technische Univ. München (Germany); Fabian Bamberg, Konstantin Nikolaou, Maximilian F. Reiser, Ludwig-Maximilians-Univ. Hospital München (Germany); Önder A. Yildirim, Oliver Eickelberg, Helmholtz Zentrum München GmbH (Germany) and Comprehensive Pneumology Ctr. (Germany); Franz Pfeiffer, Technische Univ. München (Germany) . . . . . .[9033-56]

4:50 pm: **Compton coincidence volumetric imaging: a new x-ray volumetric imaging modality based on Compton scattering**, Xiaochao Xu, William Beaumont Hospital (USA)[9033-57]

5:10 pm: **Apparatus and fast method for cancer cell classification based on high harmonic coherent diffraction imaging in reflection geometry**, Michael Zürch, Friedrich-Schiller-Univ. Jena (Germany); Stefan Foertsch, Friedrich-Schiller-Univ. Jena (Germany) and Siemens AG (Germany); Mark Matzas, Siemens AG (Germany); Katharina Pachmann, Friedrich-Schiller-Univ. Jena (Germany); Rainer Kuth, Siemens AG (Germany); Christian Spielmann, Friedrich-Schiller-Univ. Jena (Germany) and Abbe School of Photonics (Germany) and Helmholtz Institute Jena (Germany) . . . . . [9033-58]]

9033 continues on page 53

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

9035 continues on page 53

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 8 (CONTINUED)
Room: California . . . . . Wed 3:30 to 5:30 pm

4:50 pm: **A user-friendly automated port placement planning system for laparoscopic robotic surgery**, Luis G. Torres, The Univ. of North Carolina at Chapel Hill (USA); Hamidreza Azimian, The Hospital for Sick Children (SickKids) (Canada); Andinet Enquobahrie, Kitware, Inc. (USA) . . . . . .[9036-39]

5:10 pm: **Preliminary testing of a compact, bone-attached robot for otologic surgery**, Neal P. Dillon, Vanderbilt Univ. (USA); Ramya Balachandran, Vanderbilt Univ. Medical Ctr. (USA); Antoine Motte dit Falisse, Univ. Catholique de Louvain (Belgium); Thomas J. Withrow, Vanderbilt Univ. (USA); George B. Wanna, Robert F. Labadie, Vanderbilt Univ. Medical Ctr. (USA); J. Michael Fitzpatrick, Robert J. Webster III, Vanderbilt Univ. (USA) . . . . . .[9036-40]

9036 continues on page 53

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

SESSION 4 (CONTINUED)
Room: Royal Palm One . Wed 3:30 to 5:30 pm

5:10 pm: **Local image descriptor-based searching framework of usable similar cases in a radiation treatment planning database for stereotactic body radiotherapy**, Ayumi Nonaka, Hidetaka Arimura, Katsumasa Nakamura, Kyushu Univ. (Japan); Yoshiyuki Shioyama, Saga Heavy Ion Medical Accelerator in Tosu (Japan); Mazen Soufi, Kyushu Univ. (Japan); Taiki Magome, The Univ. of Tokyo Hospital (Japan) and Japan Society for the Promotion of Science (Japan); Hiroshi Honda, Hideki Hirata, Kyushu Univ. (Japan) [9039-18]

9039 continues on page 53

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 4 (CONTINUED)
Room: San Diego . . . . . Wed 3:30 to 5:30 pm

5:10 pm: **Development of a novel acoustic lens based pulse echo ultrasound imaging system**, Saugata Sinha, Navalgund A. Rao, Rochester Institute of Technology (USA). . . .[9040-21]

9040 continues on page 53

Thursday · 20 February

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 12
Room: Town & Country . .Thu 8:00 to 9:40 am

Dose

Session Chairs: **Andreu Badal,** U.S. Food and Drug Administration (USA); **Hilde Bosmans,** Katholieke Univ. Leuven (Belgium)

8:00 am: **Patient-specific minimum-dose imaging protocols for statistical image reconstruction in C-arm cone-beam CT using correlated noise injection**, Adam S. Wang, Joseph W. Stayman, Yoshito Otake, Akhil J. Khanna, Gary L. Gallia, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . .[9033-59]

8:20 am: **Prospective optimization of CT under tube current modulation: I. organ dose**, Xiaoyu Tian, Duke Univ. (USA); Xiang Li, Cleveland State Univ. (USA); William P. Segars, Donald Frush, Ehsan Samei, Duke Univ. (USA) . . . . . [9033-60]

8:40 am: **Patient-specific, scanner-independent organ dose estimates for head CT exams**, Kyle McMillan, Maryam Khatonabadi, Univ. of California, Los Angeles (USA); Maria A. Zankl, Helmholtz Zentrum München GmbH (Germany); John J. DeMarco, Christopher H. Cagnon, Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA) . . . . . .[9033-61]

9:00 am: **Size-specific dose evaluation on a prototype orthopedic CBCT system**, Samuel Richard, Nathan Packard, John Yorkston, Carestream Health, Inc. (USA) . . . . . .[9033-62]

9:20 am: **Monte Carlo investigation of backscatter factors for skin dose determination in interventional neuroradiology procedures**, Artur Omar, Karolinska Univ. Hospital (Sweden); Hamza Benmakhlouf, Karolinska Univ. Hospital (Sweden) and Univ. of Stockholm (Sweden); Maria Marteinsdottir, Robert Bujila, Patrik Nowik, Karolinska Univ. Hospital (Sweden); Pedro Andreo, Stockholm Univ. (Sweden) and Karolinska Univ. Hospital (Sweden) . . . . . .[9033-63]

Poster Award Announcements
Room: Town & Country Thu 9:40 to 9:45 am
The Physics of Medical Imaging conference student paper and poster award recipients will be recognized and certificates distributed.

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

9033 continues on page 54

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

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

Prostate and Colon II

Session Chairs: **Kensaku Mori,** Nagoya Univ. (Japan); **Ronald M. Summers,** National Institutes of Health (USA)

8:00 am: **Reducing false positives of small bowel segmentation on CT scans by localizing colon regions**, Weidong Zhang, Jiamin Liu, Jianhua Yao, Ronald M. Summers, National Institutes of Health (USA) . . . . . .[9035-34]

8:20 am: **An adaptive approach for centerline extraction on CT colonography based on MAP-EM segmentation and distance field**, Hao Peng, Stony Brook Univ. (USA); Lihong C. Li, College of Staten Island (USA); Huafeng Wang, Hao Han, Stony Brook Univ. (USA); Perry J. Pickhardt, Univ. of Wisconsin-Madison (USA); Zhengrong Liang, Stony Brook Medicine (USA) . . . . . .[9035-35]

8:40 am: **Improved parameter extraction and classification for dynamic contrast enhanced MRI of prostate**, Nandinee F. Haq, Piotr Kozlowski, Edward C. Jones, Silvia D. Chang, S. Larry Goldenberg, Mehdi Moradi, The Univ. of British Columbia (Canada) . . . . . .[9035-36]

9:00 am: **Distinguishing prostate cancer from benign confounders via a cascaded classifier on multi-parametric MRI**, Geert Litjens, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Robin Elliott, Case Western Reserve Univ. (USA); Natalie Shih, Michael D. Feldman, Univ. of Pennsylvania (USA); Jelle O. Barentsz, Christina A. Hulsbergen-van de Kaa, Iringo Kovacs, Henkjan J. Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . .[9035-37]

9:20 am: **A prostate MRI atlas of biochemical failures following radiotherapy**, Mirabela Rusu, Case Western Reserve Univ. (USA); John Kurhanewicz, Univ. of California, San Francisco (USA); Anant Madabhushi, Case Western Reserve Univ. (USA). . . .[9035-38]

Poster Award Announcements
Room: Golden West . . Thu 9:40 to 9:45 am
The Computer-Aided Diagnosis conference poster award recipients will be recognized and certificates distributed.

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

9035 continues on page 54

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

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

Simulation and Modeling

Session Chairs: **Michael I. Miga,** Vanderbilt Univ. (USA); **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ. (USA)

8:00 am: **Breast deformation modeling: comparison of methods to obtain a patient specific unloaded configuration**, Bjoern Eiben, Vasileios Vavourakis, John H. Hipwell, Univ. College London (UK); Sven Kabus, Cristian Lorenz, Thomas Buelow, Philips Research (Germany); David J. Hawkes, Univ. College London (UK) [9036-41]

8:20 am: **Intraoperative measurement of indenter-induced brain deformation**, Songbai Ji, Xiaoyao Fan, Thayer School of Engineering at Dartmouth (USA); David W. Roberts, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (USA) .[9036-42]

8:40 am: **Virtual estimates of fastening strength for pedicle screw implantation procedures**, Cristian A. Linte, Mayo Clinic College of Medicine (USA); Jon J. Camp, Kurt E. Augustine, Paul M. Huddleston, David R. Holmes III, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA) . . . . . .[9036-43]

9:00 am: **A cost effective and high fidelity fluoroscopy simulator using the image-guided surgery toolkit (IGSTK)**, Ren Hui Gong, Brad Jenkins, Raymond W. Sze, Ziv R. Yaniv, Children's National Medical Ctr. (USA) . . . . . .[9036-44]

9:20 am: **Cochlear implant simulator for surgical technique analysis**, Rebecca L. Turok, Vanderbilt Univ. (USA); Robert F. Labadie, George B. Wanna, Vanderbilt Univ. Medical Ctr. (USA); Benoit M. Dawant, Jack H. Noble, Vanderbilt Univ. (USA) . . . . . [9036-45]

Poster Award Announcements
Room: California . . . . Thu 9:40 to 9:45 am
The Image-Guided Procedures, Robotic Interventions, and Modeling conference young scientist and poster award recipients will be recognized and certificates distributed.

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

9036 continues on page 54

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

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

Knowledge, Search and Data Mining

Session Chair: **William W. Boonn,** The Univ. of Pennsylvania Health System (USA)

8:00 am: **A collaborative framework for contributing DICOM RT PHI (Protected Health Information) to augment data mining in clinical decision support**, Ruchi R. Deshpande, Wanwara Thuptimdang, The Univ. of Southern California (USA); John J. DeMarco, Univ. of California, Los Angeles (USA); Brent J. Liu, The Univ. of Southern California (USA) . . . . . .[9039-19]

8:20 am: **Classification of Visual Signs in Abdominal CT Image Figures in Biomedical Literature**, Zhiyun Xue, Daekeun You, Sameer Antani, Rodney Long, Dina Demner-Fushman, George R. Thoma, National Library of Medicine (USA) . . . . . .[9039-20]

8:40 am: **Incorporating intelligence into structured radiology reports**, Charles E. Kahn Jr., Medical College of Wisconsin (USA) . . . . . .[9039-21]

9:00 am: **Pearl trees web-based interface for teaching informatics in radiology residency programs**, Mindy Licurse, Hospital of the Univ. of Pennsylvania (USA); Tessa S. Cook, The Univ. of Pennsylvania Health System (USA) . . . . . .[9039-22]

9:20 am: **Pattern search in multi-structure data: a framework for the next-generation evidence-based medicine**, Sreenivas R. Sukumar, Keela C. Ainsworth, Oak Ridge National Lab. (USA) . . . . . .[9039-23]

Poster Award Announcements
Room: Royal Palm One Thu 9:40 to 9:45 am
PACS and Imaging Informatics: Next Generation and Innovations conference poster award recipients will be recognized and certificates distributed.

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

9039 continues on page 54

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 5
Room: San Diego . . . Thu 8:00 am to 9:20 am

Photoacoustics

Session Chairs: **Navalgund A. Rao,** Rochester Institute of Technology (USA); **Robert A. Kruger,** OptoSonics, Inc. (USA)

8:00 am: **Clutter reduction techniques for improved contrast and imaging depth of clinical optoacoustic imaging**, Michael Jaeger, Sara Peeters, Univ. Bern (Switzerland); Jeffrey C. Bamber, The Royal Marsden NHS Foundation Trust (UK) and The Institute of Cancer Research (UK); Martin Frenz, Univ. Bern (Switzerland) . . . . . .[9040-23]

8:20 am: **Acousto-optic imaging by wavefront adaptive holography using photorefractive crystals**, Jean-Baptiste Laudereau, Emilie Benoit, Institut Langevin (France); Vincent Servois, Pascale Mariani, Institut Curie (France); Alexander A. Grabar, Uzhgorod National Univ. (Ukraine); Jean-Luc Gennisson, François Ramaz, Institut Langevin (France) . . . . . .[9040-24]

8:40 am: **Frequency analysis of multispectral photoacoustic images for differentiating malignant region from normal region in excised human prostate**, Saugata Sinha, Navalgund A. Rao, Rochester Institute of Technology (USA); Keerthi S. Valluru, Bhargava K. Chinni, Vikram S. Dogra, Univ. of Rochester (USA); María Helguera, Rochester Institute of Technology (USA) . . . . . .[9040-25]

9:00 am: **Coherence-based photoacoustic imaging of brachytherapy seeds implanted in a canine prostate**, Muyinatu A. Lediju Bell, Danny Y. Song, Emad M. Boctor, Johns Hopkins Univ. (USA) . . . . . .[9040-26]

Poster Award Announcements
Room: San Diego . Thu 9:20 am to 9:25 am
The Ultrasonic Imaging and Tomography conference poster award recipients will be recognized and certificates distributed.

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

9040 continues on page 54

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 13
Room: Town & Country . . . . . .Thu 10:10 am to 12:10 pm

Phantoms
Session Chairs: **Bruce R. Whiting,** Univ. of Pittsburgh (USA); **Andreu Badal,** U.S. Food and Drug Administration (USA)

10:10 am: **Design of anthropomorphic textured phantoms for CT performance evaluation**, Justin B. Solomon, Duke Univ. (USA); François O. Bochud, Ctr. Hospitalier Univ. Vaudois (Switzerland); Ehsan Samei, Duke Univ. (USA) . . . . . .[9033-64]

10:30 am: **The development of a population of 4D pediatric XCAT phantoms for CT imaging research and optimization**, Hannah Norris, Yakun Zhang, Jack Frush, Gregory M. Sturgeon, Anum Minhas, Donald Frush, Ehsan Samei, William P. Segars, Duke Univ. (USA) . . . . . [9033-65]

10:50 am: **Construction of anthropomorphic hybrid, dual-lattice voxel models for optimizing image quality and dose in radiography**, Nina Petoussi-Henss, Janine Becker, Matthias B. Greiter, Helmut Schlattl, Maria A. Zankl, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany) . . . . [9033-66]

11:10 am: **Population of 100 realistic, patient-based computerized breast phantoms for multi-modality imaging research**, William P. Segars, Duke Univ. Medical Ctr. (USA); Alexander I. Veress, Univ. of Washington (USA); Jered R. Wells, Gregory M. Sturgeon, Nooshin Kiarashi, Joseph Y. Lo, Ehsan Samei, James T. Dobbins III, Duke Univ. Medical Ctr. (USA) . . . . . .[9033-67]

11:30 am: **A second generation of physical anthropomorphic 3D breast phantoms based on human subject data**, Adam C. Nolte, Nooshin Kiarashi, Ehsan Samei, William P. Segars, Joseph Y. Lo, Duke Univ. (USA) . . . . . .[9033-68]

11:50 am: **Automatic insertion of simulated microcalcification clusters in a software breast phantom**, Varsha G. Shankla, The Univ. of Pennsylvania Health System (USA); David D. Pokrajac, Delaware State Univ. (USA); Susan P. Weinstein, Emily F. Conant, Andrew D. A. Maidment, Predrag R. Bakic, The Univ. of Pennsylvania Health System (USA). . . . . .[9033-69]

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

9033 continues on page 55

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 10
Room: Golden West .Thu 10:10 am to 12:10 pm

Musculoskeletal and Miscellaneous
Session Chairs: **Axel Wismüller,** Univ. of Rochester Medical Ctr. (USA); **Michael F. McNitt-Gray,** Univ. of California, Los Angeles (USA)

10:10 am: **Dynamic automated synovial imaging (DASI) for differential diagnosis of rheumatoid arthritis**, Enrico Grisan, Univ. degli Studi di Padova (Italy); Bernd Raffeiner, Univ. degli Studi di Padova (Italy) and Ospedale di Bolzano (Italy); Alessandro Coran, Univ. degli Studi di Padova (Italy); Luca Ciprian, Giovanni XXIII Nursing Home (Italy); Roberto Stramare, Univ. degli Studi di Padova (Italy).[9035-39]

10:30 am: **Automated identification of spinal cord and vertebras on sagittal MRI**, Chuan Zhou, Heang-Ping Chan, Qian Dong, Bo He, Jun Wei, Lubomir M. Hadjiiski, Daniel Couriel, Univ. of Michigan Health System (USA) . . . . . .[9035-40]

10:50 am: **Adaptive geodesic transform for segmentation of vertebrae on CT images**, Bilwaj K. Gaonkar, Siemens Medical Solutions USA, Inc. (USA) and Univ. of Pennsylvania (USA); Liao Shu, Gerardo Hermosillo Valadez, Yiqiang Zhan, Siemens Medical Solutions USA, Inc. (USA) .[9035-41]

11:10 am: **2D segmentation of intervertebral discs and its degree of degeneration from T2-weighted magnetic resonance images**, Isaac Castro-Mateos, José Maria Pozo, The Univ. of Sheffield (UK); Áron Lazary, National Ctr. for Spinal Disorders (Hungary); Alejandro F. Frangi, The Univ. of Sheffield (UK) . . . . . .[9035-42]

11:30 am: **Prediction of treatment response and metastatic disease in soft tissue sarcoma**, Hamidreza Farhidzadeh, Mu Zhou, Dmitry B. Goldgof, Lawrence O. Hall, Univ. of South Florida (USA); Meera Raghavan, Robert A. Gatenby, H. Lee Moffitt Cancer Ctr. & Research Institute (USA) . . . . . .[9035-43]

11:50 am: **Automatic detection and segmentation of liver metastatic lesions on serial CT examinations**, Avi Ben Cohen, Idit Diamant, Tel Aviv Univ. (Israel); Eyal Klang, Michal Amitai, Sheba Medical Ctr. (Israel); Hayit Greenspan, Tel Aviv Univ. (Israel) . . . . . .[9035-44]

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

9035 continues on page 55

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 10
Room: California . Thu 10:10 am to 12:10 pm

Pelvic Procedures
Session Chairs: **Tamas Ungi,** Queen's Univ. (Canada); **Frank Sauer,** Siemens Corp., Corporate Technology (USA)

10:10 am: **Fast segmentation of the prostate for brachytherapy based on joint fusion of images and labels**, Saman Nouranian, Mahdi Ramezani, S. Sara Mahdavi, The Univ. of British Columbia (Canada); Ingrid Spadinger, William J. Morris, British Columbia Cancer Agency (Canada); Septimiu E. Salcudean, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . . . .[9036-46]

10:30 am: **Evaluating the utility of 3D TRUS image information in guiding intra-procedure registration for motion compensation**, Tharindu S. De Silva, Derek W. Cool, Cesare Romagnoli, Aaron Fenster, Aaron D. Ward, The Univ. of Western Ontario (Canada) . . . . . .[9036-47]

10:50 am: **Toward 3D-guided prostate biopsy target optimization: an estimation of tumor sampling probabilities**, Peter R. Martin, Western Univ. Canada (Canada); Derek W. Cool, Robarts Research Institute (Canada); Cesare Romagnoli, The Univ. of Western Ontario (Canada) and London Health Sciences Ctr. (Canada); Aaron Fenster, Robarts Research Institute (Canada); Aaron D. Ward, The Univ. of Western Ontario (Canada) and Western Univ. Canada (Canada) . . . . . .[9036-48]

11:10 am: **Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation**, Geert Litjens, Henkjan J. Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Robin Elliott, Case Western Reserve Univ. (USA); Natalie Shih, Hospital of the Univ. of Pennsylvania (USA); Michael D. Feldman, The Univ. of Pennsylvania Health System (USA); Satish E. Viswanath, Case Western Reserve Univ. (USA); Jurgen Futterrer, Joyce Bomers, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Anant Madabhushi, Case Western Reserve Univ. (USA) . . . . . .[9036-49]

9036 continues on page 55

Conference 9039 continued
PACS and Imaging Informatics: Next Generation and Innovations
Room: Royal Palm One

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

Radiology for the Non-Radiologists
Session Chair: **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China)

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. The second half will open the session to questions from the audience about research innovations that may help to address some of these challenges.

CONFERENCE 9039 ENDS

11:30 am: **MRI-guided prostate focal laser ablation therapy using a mechatronic needle guidance system**, Jeremy J. Cepek, Robarts Research Institute (Canada); Uri Lindner, Sangeet Ghai, Sean R. H. Davidson, John Trachtenberg, Univ. Health Network (Canada); Aaron Fenster, Robarts Research Institute (Canada) . . . . . [9036-68]

11:50 am: **EM-navigated catheter placement for gynecologic brachytherapy: an accuracy study**, Alireza Mehrtash, Brigham and Women's Hospital (USA) and Harvard Medical School (USA); Antonio Leonardo Damato, Guillaume Pernelle, Lauren Ashley Barber, Nabgha Farhat, Akila Ninette Viswanathan, Robert A. Cormack, Tina Kapur, Brigham and Women's Hospital (USA) . . . .[9036-51]

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

9036 continues on page 55

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 6
Room: San Diego . Thu 10:10 am to 12:10 pm

Ultrasound Tomography
Session Chairs: **Neb Duric,** Delphinus Medical Technologies (USA); **Nicole V. Ruiter,** Karlsruher Institut für Technologie (Germany)

10:10 am: **Ultrasound bent-ray tomography using both transmission and reflection data**, Nghia Q. Nguyen, Lianjie Huang, Los Alamos National Lab. (USA) . . . . . .[9040-27]

10:30 am: **Comparison of sound speed measurements on two different ultrasound tomography devices**, Mark A. Sak, Karmanos Cancer Institute (USA); Neb Duric, Peter J. Littrup, Karmanos Cancer Institute (USA) and Delphinus Medical Technologies (USA); Lisa Bey-Knight, Karmanos Cancer Institute (USA); Mark E. Sherman, Gretchen Gierach, National Cancer Institute (USA); Antonina Malyarenko, Karmanos Cancer Institute (USA) . . . . . .[9040-28]

10:50 am: **Breast ultrasound tomography using virtual sources and both transmission and reflection data**, Lianjie Huang, Youzuo Lin, Zhigang Zhang, Nghia Q. Nguyen, Yassin Labyed, Kenneth M. Hanson, Los Alamos National Lab. (USA); Daniel Sandoval, Michael Williamson, The Univ. of New Mexico (USA) . . . . . .[9040-29]

11:10 am: **Optimization of the aperture and the transducer characteristics of a 3D ultrasound computer tomography system**, Nicole V. Ruiter, Michael Zapf, Torsten Hopp, Robin Dapp, Hartmut E. Gemmeke, Karlsruher Institut für Technologie (Germany). . . . . .[9040-30]

11:30 am: **Breast imaging with SoftVue: initial clinical evaluation**, Neb Duric, Peter J. Littrup, Delphinus Medical Technologies (USA) and Karmanos Cancer Institute (USA) . . . . . .[9040-31]

11:50 am: **GPU based 3D SAFT reconstruction including phase aberration**, Ernst Kretzek, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany) . . . . . .[9040-32]

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

9040 continues on page 55

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 14
Room: Town & Country . . . . . Thu 1:20 to 3:00 pm

Metrology and System Characterization

Session Chairs: **Karim S. Karim,** Univ. of Waterloo (Canada); **Joseph Y. Lo,** Duke Univ. Medical Ctr. (USA)

1:20 pm: **Cascaded systems analysis of photon counting detectors**, Jennifer Xu, Wojciech Zbijewski, Joseph W. Stayman, Grace J. Gang, Katsuyuki Taguchi, Johns Hopkins Univ. (USA); Erik Fredenberg, Philips Women's Healthcare (Sweden); John A. Carrino, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . [9033-70]

1:40 pm: **Detector system comparison using relative CNR for specific imaging tasks related to neuro-endovascular image-guided interventions (neuro-EIGIs)**, Brendan M. Loughran, Swetadri Vasan Setlur Nagesh, Vivek Singh, Ciprian N. Ionita, Amit Jain, Daniel R. Bednarek, Stephen Rudin, Toshiba Stroke and Vascular Research Ctr. (USA) . . . . . [9033-71]

2:00 pm: **Method for measuring the intensity profile of a CT fan-beam filter**, Bruce R. Whiting, Univ. of Pittsburgh (USA); Andreea C. Dohatcu, Univ. of Pittsburgh Medical Ctr. (USA) . . . . . [9033-72]

2:20 pm: **Prospective optimization of CT under tube current modulation: II. image quality**, Xiaoyu Tian, Christopher Smitherman, Olav Christianson, Donald Frush, Ehsan Samei, Duke Univ. (USA) . . . . . [9033-73]

2:40 pm: **A task-based comparison of two reconstruction algorithms for digital breast tomosynthesis**, Ravi Mahadevan, Duke Univ. (USA); Lynda C. Ikejimba, Yuan Lin, Carl E. Ravin Advanced Imaging Labs. (USA); Ehsan Samei, Joseph Y. Lo, Duke Univ. (USA) and Carl E. Ravin Advanced Imaging Labs. (USA) . . . . . [9033-74]

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

9033 continues on page 56

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 11
Room: Golden West . . . . . Thu 1:20 to 3:00 pm

Breast II

Session Chairs: **Horst Karl Hahn,** Fraunhofer MEVIS (Germany); **Hiroshi Fujita,** Gifu Univ. School of Medicine (Japan)

1:20 pm: **Identification of corresponding lesions in multiple mammographic views using star-shaped iso-contours**, Rafael Wiemker, Dominik Kutra, Harald S. Heese, Thomas Buelow, Philips Research (Germany) . . . . . [9035-45]

1:40 pm: **Boosting classification performance in computer aided diagnosis of breast masses in raw full-field digital mammography using processed and screen film images**, Thijs Kooi, Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9035-46]

2:00 pm: **Breast ultrasound image classification using clinical and visual data fusion by multiple kernel learning**, Pavel Kisilev, IBM Research - Haifa (Israel); Sharbell Hashoul, Carmel Medical Ctr. (Israel) . . . . . [9035-47]

2:20 pm: **Breast density and parenchymal texture measures as potential risk factors for estrogen-receptor positive breast cancer**, Brad M. Keller, Jinbo Chen, Univ. of Pennsylvania School of Medicine (USA); Emily F. Conant, The Univ. of Pennsylvania Health System (USA); Despina Kontos, Univ. of Pennsylvania School of Medicine (USA) . . . . . [9035-48]

2:40 pm: **Ultrasound breast lesion segmentation using adaptive parameters**, Baek Hwan Cho, Yeong Kyeong Seong, Samsung Advanced Institute of Technology (Korea, Republic of); Zhihua Liu, Zhihui Hao, Samsung Advanced Institute of Technology (China); Eun Young Ko, SAMSUNG Medical Ctr. (Korea, Republic of); Kyoung-Gu Woo, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [9035-49]

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

9035 continues on page 56

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: San Diego

SESSION 11
Room: San Diego . . . . . Thu 1:20 to 3:00 pm

Ultrasound Image Guidance

Joint Session with Conferences 9036 and 9040

Session Chairs: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands)

1:20 pm: **In vivo validation of a 3D ultrasound system for imaging the lateral ventricles of neonates**, Jessica Kishimoto, Aaron Fenster, Robarts Research Institute (Canada); Nancy Chen, Western Univ. Canada (Canada); David S. Lee, London Health Research Ctr. (Canada); Sandrine de Ribaupierre, London Health Research Ctr. (Canada) and Western Univ. Canada (Canada). . . . . [9036-52]

1:40 pm: **3D endobronchial ultrasound reconstruction and analysis for multimodal image-guided bronchoscopy**, Xiaonan Zang, The Pennsylvania State Univ. (USA); Rebecca Bascom, Christopher R Gilbert, Jennifer W Toth, The Pennsylvania State Hershey Medical Center (USA); William E. Higgins, The Pennsylvania State Univ. (USA) . . . . . [9040-33]

2:00 pm: **Visualizing positional uncertainty in freehand 3D ultrasound**, Houssem-Eddine Gueziri, Ecole de Technologie Supérieure (Canada); Michael J McGuffin, Catherine Laporte, École de Technologie Supérieure (Canada) . . . . . [9036-53]

2:20 pm: **Determining inter-fractional motion of the uterus using 3D ultrasound imaging during radiotherapy for cervical cancer**, Mariwan Baker, Claus F. Behrens, Univ. Hospital Herlev (Denmark). . . . . [9040-34]

2:40 pm: **Synthetic aperture imaging in ultrasound calibration**, Golafsoun Ameri, John S. H. Baxter, A. Jonathan McLeod, Uditha L. Jayaranthe, Elvis C. S. Chen, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9036-54]

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

9036 continues on page 56

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 7
Room: San Diego . . . . . Thu 1:20 to 3:00 pm

9040 continues on page 56

Conference 9033 continued
Physics of Medical Imaging
Room: Town & Country

SESSION 15
Room: Town & Country .... Thu 3:30 to 5:30 pm

Performance Evaluation

Session Chairs: **Despina Kontos,** The Univ. of Pennsylvania Health System (USA); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany)

3:30 pm: **A refined methodology for modeling volume quantification performance in CT**, Baiyu Chen, Ehsan Samei, Duke Univ. (USA). . . . . [9033-75]

3:50 pm: **The role played by internal noise in Channelized Hotelling Observer (CHO) study of detectability index: differential phase contrast CT versus conventional CT**, Xiangyang Tang, Emory Univ. (USA); Yi Yang, The Winship Cancer Institute of Emory Univ. (USA) . . . . . [9033-76]

4:10 pm: **Towards continualized task-based resolution modeling in PET imaging**, Saeed Ashrafinia, Nicolas Karakatsanis, Hassan Mohy-ud-Din, Arman Rahmim, Johns Hopkins Univ. (USA) . [9033-77]

4:30 pm: **CT x-ray tube voltage optimisation and image reconstruction evaluation using visual grading analysis**, Xiaoming Zheng, Ted M. Kim, Rob Davidson, Charles Sturt Univ. (Australia); Seongju Lee, Cheongil Shin, Seoul National Univ. Hospital (Korea, Republic of); Sook Yang, Dongshin Univ. (Korea, Republic of). . . . . [9033-78]

4:50 pm: **High-performance soft-tissue imaging in extremity cone-beam CT**, Wojciech Zbijewski, Joseph W. Stayman, Abdullah Al Muhit, Gaurav Thawait, Johns Hopkins Univ. (USA); Nathan Packard, Robert A. Senn, Dong Yang, John Yorkston, Carestream Health, Inc. (USA); John A. Carrino, Jeffrey H. Siewerdsen, Johns Hopkins Univ. (USA) . . . . . [9033-79]

5:10 pm: **Analyzing the performance of ultrasonic B-mode imaging for breast lesion diagnosis**, Sara Bahramian, Univ. of Illinois at Urbana-Champaign (USA); Craig K. Abbey, Univ. of California, Santa Barbara (USA); Michael F. Insana, Univ. of Illinois at Urbana-Champaign (USA) . . . . . [9033-80]

CONFERENCE 9033 ENDS

Conference 9035 continued
Computer-Aided Diagnosis
Room: Golden West

SESSION 12
Room: Golden West . . . . . Thu 3:30 to 5:30 pm

Lung, Chest, and Abdomen II

Session Chairs: **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr. (USA); **Rafael Wiemker,** Philips Research (Germany)

3:30 pm: **Comparison of CLASS and ITK-SNAP in segmentation of urinary bladder in CT urography**, Kenny Cha, Lubomir M. Hadjiiski, Heang-Ping Chan, Elaine M. Caoili, Richard H. Cohan, Chuan Zhou, Univ. of Michigan (USA) . . . . . [9035-50]

3:50 pm: **Abdominal lymphadenopathy detection using random forest**, Kevin M. Cherry, Shijun Wang, Evrim B. Turkbey, Ronald M. Summers, National Institutes of Health (USA) . . . . . [9035-51]

4:10 pm: **A new classifier fusion method based on confusion matrix and classification confidence for recognizing common CT imaging signs of lung diseases**, Ling Ma, Xiabi Liu, Li Song, Yu Liu, Beijing Institute of Technology (China); Chunwu Zhou, Xinming Zhao, Yanfeng Zhao, Chinese Academy of Medical Sciences (China) . . . . . [9035-52]

4:30 pm: **Automated detection and quantification of micronodules in thoracic computed tomography scans to identify subjects at risk for silicosis**, Colin Jacobs, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Sjoerd H. T. Opdam, Technische Univ. Eindhoven (Netherlands); Eva M. van Rikxoort, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Onno M. Mets, Academisch Medisch Centrum (Netherlands); Jos M. Rooijackers, Utrecht Univ. (Netherlands) and Netherlands Expertise Ctr. for Occupational Respiratory Disorders (Netherlands); Pim A. de Jong, Univ. Medical Ctr. Utrecht (Netherlands); Mathias Prokop, Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9035-53]

4:50 pm: **Multiple-instance learning for computer-aided detection of tuberculosis**, Jaime Melendez, Clarisa I. Sánchez, Rick Philipsen, Pragnya Maduskar, Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . . [9035-54]

5:10 pm: **Seamless insertion of real pulmonary nodules in chest CT exams**, Aria X. Pezeshk, Berkman Sahiner, Rongping Zeng, Adam Wunderlich, Weijie Chen, Nicholas A. Petrick, U.S. Food and Drug Administration (USA) . . . . . [9035-55]

CONFERENCE 9035 ENDS

Conference 9036 continued
Image-Guided Procedures, Robotic Interventions, and Modeling
Room: California

SESSION 12
Room: California . . . . . Thu 3:30 to 5:30 pm

Cardiac Procedures

Session Chairs: **Baowei Fei,** Emory Univ. (USA); **Maryam E. Rettmann,** Mayo Clinic (USA)

3:30 pm: **Efficient feature-based 2D/3D registration of transesophageal echocardiography to X-ray fluoroscopy for cardiac interventions**, Charles R. Hatt, Michael A. Speidel, Amish N. Raval, Univ. of Wisconsin-Madison (USA). . . . . [9036-72]

3:50 pm: **Toward standardized mapping for left atrial analysis and cardiac ablation guidance**, Maryam E. Rettmann, David R. Holmes III, Mayo Clinic (USA); Cristian A. Linte, Mayo Clinic College of Medicine (USA); Douglas L. Packer, Mayo Clinic (USA); Richard A. Robb, Mayo Clinic College of Medicine (USA) . . . . . [9036-56]

4:10 pm: **Intraoperative measurements on the mitral apparatus using optical tracking: a feasibility study**, Sandy Engelhardt, Deutsches Krebsforschungszentrum (Germany); Raffaele De Simone, Ruprecht-Karls-Univ. Heidelberg (Germany); Diana Wald, Deutsches Krebsforschungszentrum (Germany); Norbert Zimmermann, Sameer Al Maisary, Carsten J. Beller, Matthias Karck, Ruprecht-Karls-Univ. Heidelberg (Germany); Hans-Peter Meinzer, Deutsches Krebsforschungszentrum (Germany); Ivo Wolf, Deutsches Krebsforschungszentrum (Germany) and Hochschule Mannheim (Germany) . . . . . [9036-57]

4:30 pm: **Ultrasound based mitral valve annulus tracking for off-pump beating heart mitral valve repair**, Feng P. Li, Martin Rajchl, John T. Moore, Terry M. Peters, Robarts Research Institute (Canada) . . . . . [9036-58]

4:50 pm: **Patient-specific left atrial wall-thickness measurement and visualization for radiofrequency ablation**, Jiro Inoue, Robarts Research Institute (Canada); Allan C. Skanes, Western Univ. Canada (Canada); James A. White, Robarts Research Institute (Canada) and Western Univ. Canada (Canada); Martin Rajchl, Maria Drangova, Robarts Research Institute (Canada) . . . . . [9036-59]

5:10 pm: **Mapping cardiac fiber orientations from high resolution DTI to high frequency 3D ultrasound**, Xulei Qin, Silun Wang, Ming Shen, Xiaodong Zhang, Mary B. Wagner, Emory Univ. (USA); Baowei Fei, Emory Univ. (USA) and Georgia Insitute of Technology (USA) . . . . . [9036-60]

CONFERENCE 9036 ENDS

Conference 9040 continued
Ultrasonic Imaging and Tomography
Room: San Diego

SESSION 8
Room: San Diego . . . . . Thu 3:30 to 5:30 pm

Doppler and Novel Imaging Applications

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

3:30 pm: **Rapid measurements of intensities for safety assessment of advanced imaging sequences**, Jørgen A. Jensen, Morten F. Rasmussen, Matthias B. Stuart, Borislav G. Tomov, Technical Univ. of Denmark (Denmark) . . . . . [9040-35]

3:50 pm: **Hard real-time beam scheduler enables adaptive images in multi-probe systems**, Richard J. Tobias, Cephasonics (USA) . . . . . [9040-36]

4:10 pm: **Reliable angle estimation for low velocity flow in synthetic aperture**, Carlos A. Villagomez Hoyos, Matthias B. Stuart, Jørgen A. Jensen, Technical Univ. of Denmark (Denmark). . . . . [9040-74]

4:30 pm: **Comparison of vector velocity imaging using directional beamforming and transverse oscillation for a convex array transducer**, Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . . [9040-38]

4:50 pm: **Investigating a method for non-invasive ultrasound aberration correction through the skull bone**, Meaghan A. O'Reilly, Sunnybrook Research Institute (Canada); Ryan M. Jones, Kullervo Hynynen, Sunnybrook Research Institute (Canada) and Univ. of Toronto (Canada). . . . . [9040-39]

5:10 pm: **Detection and display of acoustic window for guiding and training cardiac ultrasound users**, Sheng-Wen Huang, Emil Radulescu, Shougang Wang, Philips Research North America (USA); Karl E. Thiele, David Prater, Douglas Maxwell, Patrick Rafter, Philips Healthcare (USA); Clement Dupuy, Jeremy Drysdale, Ramon Erkamp, Philips Research North America (USA) . . . . . [9040-40]

CONFERENCE 9040 ENDS

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General Information

Registration

Onsite Registration and Badge Pick-Up Hours
Atlas Foyer

Saturday 15 February . . . . . 7:30 am to 4:00 pm
Sunday 16 February . . . . . 7:15 am to 4:00 pm
Monday 17 February . . . . . 7:30 am to 4:00 pm
Tuesday 18 February. . . . . 7:30 am to 4:00 pm
Wednesday 19 February . . . . . 7:30 am to 4:00 pm
Thursday 20 February . . . . . 7:30 am to 1:30 pm

Conference Registration

Includes admission to all conference sessions, plenary, panels, and poster sessions, coffee breaks, and a choice of proceedings. Student pricing does not include proceedings.

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Courses and workshops are priced separately. Course-only registration includes your selected course(s), course notes, and coffee breaks. Course prices include applicable taxes. Onsite, please go to Course Materials Pickup after you pick up your badge.

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Speaker Check-In and Preview Station
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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.

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Grand Exhibit Hall

Sunday/Monday Poster Session

Author Setup Time . . . . . Sunday Noon to 1:30 pm

Authors Remove Posters . . . . . Monday 6:45 to 9 pm

Tuesday/Wednesday Poster Session

Author Setup Time . . . . . Tuesday 9:40 to 11 am

Authors Remove Posters. . . . . Wednesday 7 to 9 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 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.

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Grand Exhibit Hall
Sunday - Thursday

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Registration Hours

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Complimentary coffee will be served twice each day of the conference in the following locations:

Saturday 15 February . . . . . 10 am and 3 pm
Rose Garden Patio

Sunday 16 February . . . . . .9:30 am and 3 pm
Grand Exhibit Hall

Monday 17 February . . . . . 9:30 am and 3:20 pm
Grand Exhibit Hall

Tuesday 18 February. . . . . .9:30 am and 3 pm
Grand Exhibit Hall

Wednesday 19 February . . . . . .9:30 am and 3 pm
Grand Exhibit Hall

Thursday 20 February . . . . . .9:30 am and 3 pm
Atlas Foyer

Food & Refreshments for Purchase

Trellises Garden Grille
Open 7am to 9 pm

Serving California Fresh fare. Daily happy hour.

Terrace Café
Open 6 am to 8 pm

Serving breakfast, lunch, and dinner in a bistro style café.

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Open from 7am to 10 pm

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Open from 11 am to Midnight

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Grand Plaza
12:10 to 1:00 pm, Sunday through Thursday

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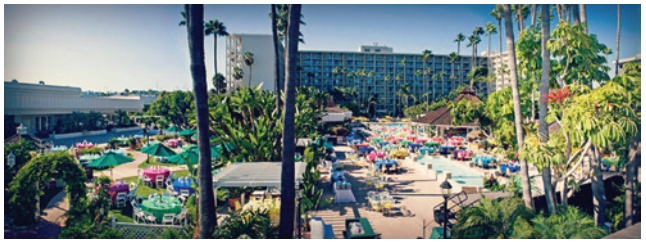
Should inclement weather prevent outdoor lunches, they will be served in the Grand Exhibit Hall.



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Town & Country Resort and Convention Center
500 Hotel Circle North, San Diego, CA 92108

San Diego

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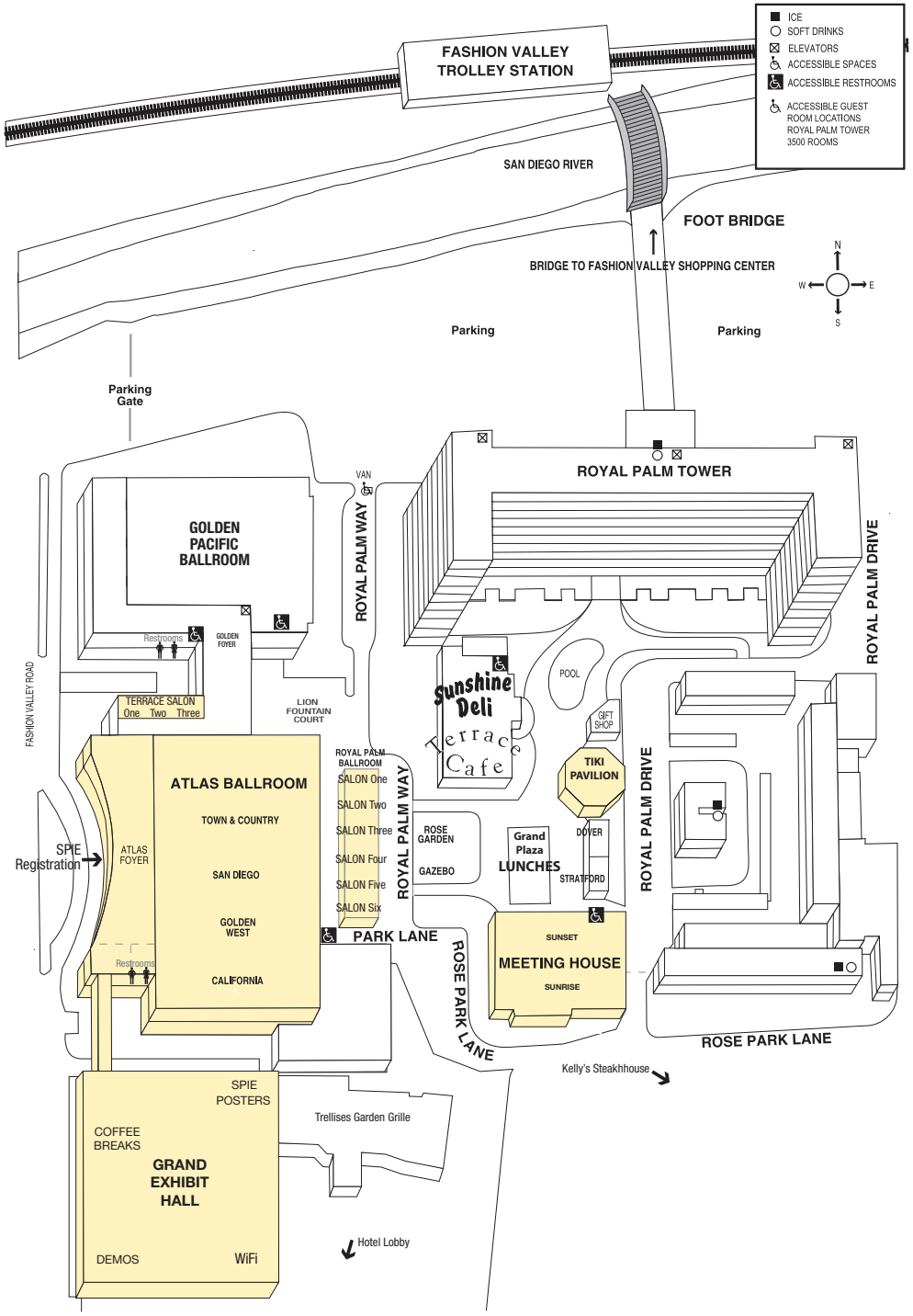

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Personal belongings should not be left unattended in meeting rooms or public areas. Unattended items are subject to removal by security. SPIE is not responsible for items left unattended.

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 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 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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