SPIE
Medical Imaging
Technical Program

Connecting minds for global solutions

Conference Dates

12-17 February 2011

Disney's Coronado Springs Resort
Lake Buena Vista
(Orlando Area), Florida, USA

spie.org/mi

Technologies

- Physics of Medical Imaging
- Image Processing
- Computer-Aided Diagnosis
- Biomedical Applications in Imaging
- Image Perception, Observer
  Performance, Technology Assessment

- Advanced PACS-based Imaging
  Informatics
- Ultrasonic Imaging, Tomography, and
  Therapy
- Visualization, Image-guided Procedures,
  Modeling

SPIE
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SPIE Medical Imaging

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Disney's Coronado Springs Resort
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Cooperating Organizations

AAPM—American Association of Physicists in Medicine

APS—American Physiological Society

CARS—Computer Assisted Radiology and Surgery

IS&T—The Society for Imaging Science and Technology

MIPS—Medical Image Perception Society

RSNA—Radiological Society of North America

SIIM—Society for Imaging Informatics in Medicine

SMI—The Society for Molecular Imaging

The DICOM Standards Committee

Welcome to Medical Imaging 2011

This year's meeting features technical presentations on the most up-to-date research and development in the areas of physics of medical imaging; image processing; computer-aided diagnosis; image visualization, and image-guided procedures and modeling; biomedical applications in molecular, structural and functional imaging; image perception, observer performance, and technology assessment; advanced PACS-based imaging informatics and therapeutic applications; and ultrasonic imaging and signal processing.

Attend the many special events and workshops to enhance your conference experience. Join William Hendee from the Medical College of Wisconsin and hear his plenary presentation on The Expanding Role of Physics and Engineering in Medical Imaging.

Connect with colleagues, exchange research, take a course and earn CAMPEP credits, and attend special and technical events. Learn, network, and enjoy your time in Florida.

Symposium Chairs:

Maryellen Giger
The Univ. of Chicago

Joseph M. Reinhardt
The Univ. of Iowa

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Special Events

Technical Conferences

General Information

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Student Paper Award Sponsor

VIDA DIAGNOSTICS

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Monday 14 February · 4:00 to 5:00 pm · Coronado H Ballroom

Session Chairs:

Maryellen Giger
The Univ. of Chicago

Joseph M. Reinhardt
The Univ. of Iowa

Student Paper Awards

The first place winner and runner up of the Student Paper Award
will be announced and conference finalists will be recognized.

SPIE Fellows Award

New SPIE Fellows Recognition - **Fu-pen Chiang,** Ph.D.

Plenary Presentation

The Expanding Role of Physics and Engineering in Medical Imaging

William Hendee
Medical College of Wisconsin (USA)

Abstract: Physics and engineering have always been the foundation for medical imaging. With the growing complexity of imaging technologies, this foundation has grown in both breadth and depth, making the underlying physics and engineering more obscure to physicians and others responsible for the clinical use of the technologies. This is especially true in reconstruction imaging where the computation and display of medical images is separated from the acquisition of patient data. For this reason, physicists and engineers are needed who can validate the imaging process, including quantitative as well as qualitative information about patients. The role of these individuals is even more important in digital technologies employing ionizing radiation, because imaging procedures should yield essential information about the patient with the least possible radiation dose. As accreditation of "high tech" (CT, PET, MRI) imaging services gains momentum among healthcare payers, it is likely that a greater demand for physicists and engineers will arise. Finally, the evolution of imaging technologies and their applications, a traditional role for physicists and engineers, show no signs of abatement anytime in the foreseeable future.

Biography: **William Hendee** completed his PhD in physics at the University of Texas. He spent 20 years on the faculty of the University of Colorado, including 9 years as Professor and Chair of the Department of Radiology. For six years Dr. Hendee was Vice President for Science & Technology of the American Medical Association. From 1991-2006 Dr. Hendee was at the Medical College of Wisconsin as Dean of the Graduate School of Biomedical Sciences, Vice Chair of Radiology, President of the MCW Research Foundation, Dean of Research, and Interim Dean of the School of Medicine. He currently holds professorships at the Medical College of Wisconsin, Marquette University, University of Wisconsin-Milwaukee, University of Colorado and University of New Mexico. He has received the Elda Anderson award from the Health Physics Society, the Coolidge Award from the American Association of Physicists in Medicine, and gold medals from the American Roentgen Ray Society, Radiological Society of North America, and American College of Radiology.

2011 Student Paper Awards Conference Finalists

Join us on Monday at 4:00 pm in the Coronado H Ballroom for the recognition of the conference finalists and an announcement of the first place winner and runner up.

Congratulations to the following student authors whose papers were chosen from 35 submissions to advance to the final round in the competition.

Physics of Medical Imaging (7961)
Raymond J. Acciavatti, The Univ. of Pennsylvania Health System (USA)

Investigating the potential for super-resolution in digital breast tomosynthesis [7961-202]

Image Processing (7962)
Manuel J. Cardoso, Univ. College London (United Kingdom)

Topologically correct cortical segmentation using Khalimsky's cubic complex framework [7962-24]

Annemie Ribbens, Katholieke Univ. Leuven (Belgium)

Probabilistic framework for subject-specific and population analysis of longitudinal changes and disease progression in brain MR images [7962-44]

Computer-Aided Diagnosis (7963)
Shannon C. Agner, Rutgers, The State Univ. of New Jersey (USA)

Spectral embedding based active contour (SEAC): application to breast lesion segmentation on DCE-MRI [7963-4]

Guido van Schie, Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

Estimating corresponding locations in ipsilateral breast tomosynthesis views [7963-5]

Visualization, Image-Guided Procedures, and Modeling (7964)
Mohammad Peikari, Queen's Univ. (Canada)

Section-thickness profiling for brachytherapy ultrasound guidance [7964-26]

Sebastian Röhl, Karlsruher Institut für Technologie (Germany)

Real-time surface reconstruction from stereo endoscopic images for intraoperative registration [7964-39]

Ultrasonic Imaging and Signal Processing (7968)
Jeeun Kang, Sogang Univ. (Korea, Republic of)

The new efficient multi-beamforming method base on multiple-access register block on a post-fractional filtering architecture [7968-33]

Student Paper Award Sponsored by:

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DIAGNOSTICS

Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday
12 February	**13 February**	**14 February**	**15 February**	**16 February**	**17 February**

SC086 Fundamentals of Medical Image Processing and Analysis (Deserno) 8:30 am to 5:30 pm, p. 11

SC1028 Introduction to ImageJ with Applications to Image Processing and Image Analysis (VanMetter) 8:30 am to 12:30 pm, p. 11 **[NEW]**

SC1025 Statistics of Medical Imaging (Lei) 8:30 am to 5:30 pm, p. 11 **[NEW]**

SC1026 Graph Algorithmic Techniques for Biomedical Image Segmentation (Garvin, Wu) 1:30 to 5:30 pm, p. 11 **[NEW]**

SC829 MIC-GPU: High-Performance Computing for Medical Imaging on Programmable Graphics Hardware (GPU) (Mueller, Xu) 1:30 to 5:30 pm, p. 11

WS776 Writing for Publication in Medical Imaging (Hanson) 1:30 to 5:30 pm, p. 53

Sunday — 13 February

KEYNOTE PRESENTATION: **7961 Economics in Medical Imaging** (Thrall) 8:00 am, p. 6

SC939 Exact Cone Beam Reconstruction: Theory and Practice (Katsevich, Zamyatin) 8:30 am to 12:30 pm, p. 11

SC471 Principles and Advancements in X-ray Computed Tomography (Hsieh) 8:30 am to 12:30 pm, p. 11

KEYNOTE PRESENTATION: **7964 Engineering solutions in the operating room: a surgeon's perspective** (Herrell) 10:10 am, p. 6

7961 Physics of Medical Imaging (Pelc, Samei) p. 14

7964 Visualization, Image-Guided Procedures, and Modeling (Wong, Holmes) p. 14

7965 Biomedical Applications in Molecular, Structural, and Functional Imaging (Weaver, Molthen) p. 14

7968 Ultrasonic Imaging, Tomography, and Therapy (D'hooge, Doyley) p. 15

Sunday/Monday Poster Session Noon to Mon. 7:00 pm, p. 10

SC987 Spectral CT Imaging (Heismann, Schmidt, Flohr) 1:30 to 5:30 pm, p. 11

SC358 X-Ray Detector Performance: Principles and Measurements using a Linear Systems Approach (Cunningham) 1:30 to 5:30 pm, p. 11

WS1024 Medical Imaging: From Concept to Market (Analoui) 1:30 to 5:30 pm, p. 11 **[NEW]**

WORKSHOPS, 5:45 to 7:45 pm, p. 8
7961 Statistical Reconstruction in CT (Pelc)
7964 Toolkits and Research Interfaces for Image-Guidance and Visualization
7965 Magnetic Particle Imaging (Weaver, Buzug)

Writing a Competitive NIH Application, 5:45 to 8:00 pm, p. 8

Monday — 14 February

KEYNOTE PRESENTATION: **7962 Medical Image Analysis: Today's Expectations and Tomorrow's Challenges** (Sonka) 8:00 am, p.6

SC613 Statistical Methods in Medical Imaging and Bioengineering with Applications to Observer Performance Evaluation (Krupinski, Chakraborty) 8:30 am to 5:30 pm, p. 11

KEYNOTE PRESENTATION: **7968 Ultrasound guidance of cardiac interventions** (Peters) 10:10 am, p. 7

7962 Image Processing (Dawant, Haynor) p. 14

Meet the NIH Staff, 12:15 to 1:20, p. 11

KEYNOTE PRESENTATION: **7965 MPI cell tracking: What can we learn from MRI?** (Bulte) 1:20 pm, p. 7

All Conference Plenary and Awards Session, 4:00 to 5:00 pm, p. 2

Interactive Poster Session and Reception, 5:00 to 6:30 pm, p. 10

Dessert with the Experts— *A Student Networking Event,* 6:30 to 7:30 pm, p. 11

Tuesday — 15 February

KEYNOTE PRESENTATION: **7963 CAD: if the world is close to ideal** (Chan) 8:00 am, p. 6

7963 Computer-Aided Diagnosis (Summers, van Ginneken) p. 14

Tuesday/Wednesday Poster Session Noon to Wed. 7:00 pm, p. 10

Women's Networking Lunch, 12:10 to 1:30 pm, p. 11

WS757 Early Career Professional Development in Medical Imaging (Krupinski) 1:30 to 5:30 pm, p. 53

WORKSHOPS, 5:45 to 7:45 pm, p. 9
7962 Academic-Industrial Collaborations: What works, what doesn't work? (Haynor)
7963 CAD Demonstration (Aylward, Chan)
7966 Device Evaluation: Perspectives from Inside and Outside the FDA (Mello-Thoms)
7967 DICOM

Wednesday — 16 February

7966 Image Perception, Observer Performance, and Technology Assessment (Manning, Abbey) p. 15

7967 Advanced PACS-based Imaging Informatics and Therapeutic Applications (Boonn, Liu) p. 15

KEYNOTE PRESENTATION: **7967 Brain-behavior correlates of neurorehabilitation: challenges and opportunities for transformational interdisciplinary collaborations** (Winstein) 1:20 pm, p. 7

Interactive Poster Session and Reception, 5:30 to 7:00 pm, p. 10

Meet the NIH Staff, 12:15 to 1:20 pm, p. 11

ATTENTION: Course prices have been rolled back to 2009 pricing.

Registration Required.
See SPIE Cashier to register.

Thursday — 17 February

KEYNOTE PRESENTATION: **7966 The observer end of digital imaging: integrating the digital microscope into clinical practice** (Hewitt) 8:00 am, p. 7

SPECIAL SESSION: **7961 Radiation Dose,** 8:00 am to 12:10 pm, p. 2

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Daily Conference Session Schedule

TIME	Conference 7961 Room: Fiesta 5	Conference 7962 Room: Fiesta 6	Conference 7963 Room: Fiesta 1-3	Conference 7964 Room: Monterey 1-3	Conference 7965 Room: Fiesta 8-10	Conference 7966 Room: Monterey 1-3	Conference 7967 Room: Fiesta 8-10	Conference 7968 Room: Fiesta 1-3
SUNDAY · 13 February								
Sun. 8:00 to 9:40 am	SESSION 1: Keynote and Imaging and Health Economics			SESSION 1: Image Guided Therapy I	SESSION 1: Brain Imaging I: fMRI			SESSION 1: New Developments in Ultrasound Tomography
9:40 to 10:10 am	Coffee Break							
10:10 am to 12:10 pm	SESSION 2: X-ray Imaging			SESSION 2: Keynote and Image Guidance in Urology	SESSION 2: Optical Imaging I			SESSION 2: Novel Imaging Devices and Approaches
12:10 to 1:20 pm	Lunch Break							
1:20 to 3:00 pm	SESSION 3: Metrology			SESSION 3: Visualization and Modeling	SESSION 3: Body Imaging: Image Based Analysis			SESSION 3: Tissue Characterization and Modeling
3:30 to 5:30 pm	SESSION 4: Iterative and Statistical Reconstruction			SESSION 4: Image Segmentation and Registration	SESSION 4: Bone and Micro-CT			SESSION 4: Clinical Application of Novel Ultrasound Imaging Modalities
MONDAY · 14 February								
Mon. 8:00 to 9:40 am	SESSION 5: Detectors I	SESSION 1: Keynote and Segmentation I		SESSION 5: Lung	SESSION 5: Brain Imaging II: Image Based Analysis			SESSION 5: Modeling for Ultrasound System Design
9:40 to 10:10 am	Coffee Break							
10:10 am to 12:10 pm	SESSION 6: Detectors II	SESSION 2: Cardiac Applications		JOINT SESSION— SESSION 6: Keynote and Ultrasound Guided Intervention	SESSION 6: Magnetic Particle Imaging			Room: Monterey 1-3 JOINT SESSION— SESSION 6: Keynote and Ultrasound Guided Intervention
12:10 to 1:20 pm	Lunch Break							
1:20 to 3:40 pm	SESSION 7: Breast Imaging	SESSION 3: Skeletal and Orthopedic Applications		SESSION 7: Neuro	SESSION 7: Keynote and Nanoparticle Imaging			SESSION 7: Vascular Imaging andUltrasound Beam Forming
3:40 to 4:00 pm	Coffee Break							Poster Award Announcements
4:00 to 5:00 pm	Best Student Paper Awards and Plenary Presentation							
5:00 to 6:30 pm		Sunday/Monday Poster Session		Sunday/Monday Poster Session	Sunday/Monday Poster Session			Sunday/Monday Poster Session
TUESDAY · 15 February								
Tues. 8:00 to 9:40 am	SESSION 8: Tomosynthesis I: Reconstruction	SESSION 4: 2D Image Analysis	SESSION 1: Keynote and Bone CAD	SESSION 8: Cardiac Applications	SESSION 8: Brain Imaging III: Function			
9:40 to 10:10 am	Coffee Break	Poster Award Announcements		Poster Award Announcements	Poster Award Announcements			
10:10 am to 12:10 pm	SESSION 9: Tomosynthesis II	SESSION 5: Brain Structure and DTI	SESSION 2: Breast Imaging I	SESSION 9: Endoscopy and Laparoscopy	SESSION 9: Optical Imaging II			
12:10 to 1:20 pm	Lunch Break							
1:20 to 3:00 pm	SESSION 10: X-ray Imaging: Phase Contrast, Diffraction	SESSION 6: Registration I	SESSION 3: Lung Nodules	SESSION 10: Orthopedic and Cranial Procedures	SESSION 10: Vascular Imaging			

Daily Conference Session Schedule

TIME	Conference 7961 Room: Fiesta 5	Conference 7962 Room: Fiesta 6	Conference 7963 Room: Fiesta 1-3	Conference 7964 Room: Monterey 1-3	Conference 7965 Room: Fiesta 8-10	Conference 7966 Room: Monterey 1-3	Conference 7967 Room: Fiesta 8-10	Conference 7968 Room: Fiesta 1-3
TUESDAY · 15 February (Continued)								
3:00 to 3:30 pm	Coffee Break							
3:30 to 5:30 pm	SESSION 11: Image Reconstruction	SESSION 7: Shape Methods and Applications	SESSION 4: Vascular and Cardiac	SESSION 11: Image Guided Therapy II	SESSION 11: Chest: Lung and Cardiac			
WEDNESDAY · 16 February								
Wed. 8:00 to 9:40 am	SESSION 12: CT III: Multi-energy	SESSION 8: Segmentation II	SESSION 5: CBIR		SESSION 12: Brain Imaging IV: fMRI	SESSION 1: Perception in Screening Exams		
9:40 to 10:10 am	Coffee Break							
10:10 am to 12:10 pm	SESSION 13: Novel Systems	SESSION 9: Registration II	SESSION 6: Liver and Prostate			SESSION 2: Human Performance		
12:10 to 1:20 pm	Lunch Break							
1:20 to 3:00 pm	SESSION 14: CT IV: Cone Beam	SESSION 10: Image Enhancement/ Classification	SESSION 7: Breast Imaging II			SESSION 3: Model Observers	SESSION 1: Keynote and Database and Data Mining I	
3:00 to 3:30 pm	Coffee Break							
3:30 to 5:30 pm	SESSION 15: Dose	SESSION 11: Segmentation of Vascular Images	SESSION 8: Novel Applications and Retina			SESSION 4: ROC and Decision Metrics	SESSION 2: Database and Data Mining II	
5:30 to 7:00 pm	**Tuesday/Wednesday Poster Session**		**Tuesday/Wednesday Poster Session**			**Tuesday/Wednesday Poster Session**	**Tuesday/Wednesday Poster Session**	
THURSDAY · 17 February								
Thurs. 8:00 to 9:40 am	SESSION 16: Special Session I: Dose		SESSION 9: Machine Learning			SESSION 5: Keynote and Assessment in Pathology	SESSION 3: System Integration and Visualization: Translational Research	
9:40 to 9:45 am	Poster Award Announcements		Poster Award Announcements			Poster Award Announcements	Poster Award Announcements	
9:40 to 10:10 am	Coffee Break							
10:10 to 11:30 am	SESSION 17: Special Session II: Dose		SESSION 10: Colon and Other Gastrointestinal CAD			SESSION 6: Image Display and Presentation	SESSION 4: Imaging Informatics-based Therapeutic Applications and Decision Support	
11:30 am to 12:10 pm	Special Session III: Dose Panel Discussion							
12:10 to 1:20 pm	Lunch Break							
1:20 to 3:00 pm			SESSION 11: Breast Imaging III			SESSION 7: Vision in Medical Imaging	SESSION 5: Advanced PACS-based Workflow	
3:00 to 3:30 pm	Coffee Break							
3:30 to 5:30 pm			SESSION 12: Lung Imaging			SESSION 8: Technology Assessment and Impact	SESSION 6: System Integration and Visualization II: Large-scale Collaborations and Open Standards	

Conference Keynote Presentations

Physics of Medical Imaging
Conference 7961
Sunday, 8:00 am · Fiesta 5

Economics in Medical Imaging [7961-01]

Dr. James H. Thrall,
Massachusetts General Hospital

Powerful forces are reshaping the health system in ways that affect all stakeholders—patients, providers, payers, legislators and regulators. The fundamental as yet unresolved tension facing the system is how to provide health care to all citizens of the United States in an affordable way that adequately supports the provider base and does not lead to either rationing of care or stifling of innovation and creativity.

The imaging community will be especially challenged because we are in a prolonged phase of breakthrough developments in new technology. These break throughs have been widely embraced by medical practitioners who clearly see the value to their patients. As a consequence, growth in delivery of imaging services has far outstripped the average growth of health services. Imaging has been singled out for reimbursement cuts to mitigate the cost impact of rapid growth on the health system.

Cutbacks in Medicare payments associated with the Deficit Reduction Act of 2005 (DRA) made delivery of outpatient services far less attractive and led to a sharp drop in demand for imaging equipment. This negative impact has been further perpetuated by the recession and uncertainty surrounding health care reform.

Apart from the immediate negative impact on the vendor community, prolonged reductions in demand could negatively influence corporate research and development spending with a reduction in the rate of development of new imaging technologies. Optimistically, the dynamics in the United States will be offset by more rapid growth in other parts of the world, most importantly, China.

Biography: Dr. James H Thrall is the Radiologist-in-Chief, Massachusetts General Hospital and serves as the Juan M. Taveras Professor of Radiology, Harvard Medical School. He has held these positions since 1988.

Dr. Thrall received his M.D. Degree from the University of Michigan in 1968. He completed training in Radiology and Nuclear Medicine at the Walter Reed Army Medical Center, Washington, D.C. where he served as the Assistant Chief of Nuclear Medicine from 1973 - 1975. Dr. Thrall returned to the University of Michigan as Assistant Professor of Internal Medicine and Radiology in 1975 and was promoted to Professor in 1981.

Image Processing
Conference 7962
Monday, 8:40 am · Fiesta 6

Medical image analysis: today's expectations and tomorrow's challenges [7962-01]

Dr. Milan Sonka,
The Univ. of Iowa

This presentation will discuss possible future directions of biomedical image analysis. After a brief overview of the current state of the art, recent accomplishments, and current expectations, the focus will be on the future needs of the field. The presentation will discuss both the motivation and medically-oriented demands that will likely shape up the medical image analysis area in the years to come. Examples from application areas that are currently under development and thus likely to find their roles in the clinical reality of tomorrow will be given special attention. Hypotheses will be developed describing possible long-term directions of the field.

Biography: Milan Sonka received his Ph.D. degree in 1983 from the Czech Technical University in Prague, Czech Republic. He is Professor and Chair of the Department of Electrical & Computer Engineering, Professor of Ophthalmology & Visual Sciences, and Radiation Oncology at the University of Iowa, Co-director of the Iowa Institute for Biomedical Imaging, IEEE Fellow, and AIMBE Fellow. His research interests include medical imaging and knowledge-based image analysis with emphasis on cardiovascular, pulmonary, orthopedic, and ophthalmic image analysis. He is the first author of 3 editions of Image Processing, Analysis and Machine Vision book (1993, 1998, 2008) and co-authored or co-edited 18 books/proceedings. He has published more than 90 journal papers and over 340 other publications. He is Editor in Chief of the IEEE Transactions on Medical Imaging, and member of the Editorial Board of the Medical Image Analysis journal.

Computer-Aided Diagnosis
Conference 7963
Tuesday, 8:00 am · Fiesta 1-3

CAD: if the world is close to ideal [7963-01]

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

Computer-aided diagnosis (CAD) is an expanding field in the past few decades. In the early applications, CAD was designed mostly to analyze patient and clinical data and to generate patient-specific advice for health care purposes. As medical images in digital form became more commonly available, image analysis has provided a main source of information for CAD, be it for detection or diagnosis. CAD research has extended from mammography to other breast imaging modalities, and from breast, lung to many other organs. However, only a small number of CAD systems have been approved by FDA for clinical use to-date. These issues will be discussed, together with a summary of the related opinions from the AAPM CAD Subcommittee.

Biography: Heang-Ping Chan received her PhD degree from the University of Chicago and was an Associate Professor of Radiology there before moving to the University of Michigan at Ann Arbor in 1989. She is currently a Professor of Radiology and the Director of the Computer-Aided Diagnosis Research Laboratory at the University of Michigan. She was elected a Fellow of the AAPM and a Fellow of the Institute of Physics in 2004. Her research interests include computer-aided diagnosis, tomosynthesis, mammography, stereomammography, and diagnostic x-ray imaging. She currently co-chairs the AAPM Subcommittee on CAD and Task Group 171 on Tomosynthesis.

Visualization, Image-Guided Procedures, and Modeling
Conference 7964
Sunday, 10:10 am · Monterey 1-3

Engineering solutions in the operating room: a surgeon's perspective [7964-06]

Dr. S. Duke Herrell,
Vanderbilt Univ.

The past 2 decades have seen an explosion in engineering and technology solutions to reduce the invasiveness and risks of surgery. While the promise of genomic biology and "personalized" medicine may revolutionize disease care and diagnosis in the coming decades, the operating room continues to offer a fertile ground for innovation.

Engineering solutions such as image-guided surgery (IGS), robotics, functional and tumor targeted imaging, and tissue ablation hold promise to potentially revolutionize surgery and improve patient outcomes. Key to the development of successful solutions is a close collaboration between development engineers and surgeons. While surgical training has typically stressed biologic and anatomic knowledge, basic knowledge of engineering concepts is becoming increasingly important for successful application of engineered solutions for patient safety and improved outcomes.

Utilizing a trans-institutional collaboration of engineers and surgeons, solutions such as incorporation of IGS into robotic and kidney surgery, advanced robotic and ablative technologies, and new imaging modalities are being explored at our institution and will be reviewed.

A variety of challenges and needs for advanced engineering solutions remain in the operative environment and will be discussed.

Biography: S. Duke Herrell, M.D. is an Associate Professor of Urologic Surgery at Vanderbilt University Medical Center in Nashville, Tennessee and also serves as Director of Robotic Surgery for the Medical Center. Dr. Herrell established the Robotics and Minimally-Invasive surgery programs at Vanderbilt, and is a funded researcher in image-guided surgery and robotics. He is presently a member of the AUA Practice Guidelines Panel.

Dr. Herrell has an active practice in robotic renal and prostate surgery, utilizing advanced endoscopic and ablative technologies. He has lectured, both nationally and internationally, on a variety of topics.

Biomedical Applications in Molecular, Structural, and Functional Imaging
Conference 7965
Monday, 1:20 pm · Fiesta 8-10

MPI cell tracking: What can we learn from MRI? [7965-34]

Dr. Jeff W. Bulte,
The Johns Hopkins Univ.

MRI cell tracking using superparamagnetic iron oxide particles (SPIO) has found many applications in understanding cell biology and developing cell therapy. However, due to its indirect detection of cells through the SPIO effect on proton relaxation, there are several limitations that prevent its full exploitation.

At the present time, it has been shown that stem cells can be readily detected with an MPI spectrometer at biologically relevant concentrations. Importantly, MPI enables a linear quantification of both cell number and iron content over a wide range of concentrations, regardless of the state of SPIO as free or intracellular entity. Whether or not in conjunction with MRI, MPI cell tracking appears promising and may become translational as there are no physical constraints against building human scanners, and certain SPIO formulations can be used that are already in use as clinical MRI cell tracking agents.

Biography: Jeff W.M. Bulte is a Professor of Radiology at the Johns Hopkins University School of Medicine, with joint appointments in Biomedical Engineering and Chemical & Biomolecular Engineering. He serves as the Director of the Cellular Imaging Section in the Institute for Cell Engineering. Previously, he was a scientist at the National Institutes of Health, and obtained his Ph.D. degree Summa Cum Laude from the University in Groningen in The Netherlands.

Image Perception, Observer Performance, and Technology Assessment
Conference 7966
Thursday, 8:00 am · Monterey 1-3

The observer end of digital imaging: integrating the digital microscope into clinical practice [7966-23]

Dr. Stephen M. Hewitt,
National Institutes of Health

The development of digital microscopy, and enablement of whole-slide digital imaging alters the fundamental relationship of the observer from the microscope slide. Nowhere else is this shift more significant than anatomic pathology. Over a century of anatomic pathology has been based on the microscopic examination of tissue for cyto- and morphologic features by means of a microscope. Although the microscope has evolved substantially over the last century, evaluation of a microscopic image projected on a computer display differs substantially from direct observation by means of an optical microscope. The challenge is to define how this difference in approach affects diagnostic histopathology and provide approaches, guidelines and refinements to improve patient care

Biography: Stephen M. Hewitt, M.D., Ph.D., is a Clinical Investigator in the Laboratory of Pathology, Center for Cancer Research, National Cancer Institute at the National Institutes of Health. He is chief of the Tissue Array Research Program and the Applied Molecular Pathology Laboratory. Dr. Hewitt's research interests include tissue-based biomarkers for cancer diagnosis, prognosis and prediction of response to therapy. He received his bachelor's degree from the Johns Hopkins University, and his M.D, and Ph.D. from the University of Texas Health Science Center, Houston. Dr. Hewitt completed his residency in Anatomic Pathology within the Laboratory of Pathology at the National Cancer Institute.

Advanced PACS-based Imaging Informatics, and Therapeutic Applications
Conference 7967
Wednesday, 1:20 pm · Fiesta 8-10

Brain-behavior correlates of neurorehabilitation: challenges and opportunities for transformational interdisciplinary collaborations [7967-01]

Dr. Carolee J. Winstein,
The Univ. of Southern California

We will use examples from several the large multi-site randomized controlled trials and several smaller clinical studies to illustrate the various forms of data (imaging and behavioral) and the challenges and opportunities for interdisciplinary collaboration.

Biography: Carolee J. Winstein, PhD, PT, FAPTA is professor of Biokinesiology and Physical Therapy and directs the Motor Behavior and Neurorehabilitation Laboratory, University of Southern California, Los Angeles, CA, USA. She holds a joint appointment in the Department of Neurology, USC Keck School of Medicine. She is best known for work concerned with the functional neural and behavioral basis of motor control and learning and its relationship to neurorehabilitation.

Ultrasonic Imaging, Tomography, and Therapy
Conference 7968
Monday, 10:10 am · Monterey 1-3

Ultrasound guidance of cardiac interventions [7968-28]

Dr. Terry M. Peters,
Robarts Research Institute (Canada)

Surgical procedures often have the unfortunate side-effect of causing the patient significant trauma while accessing the target site. Indeed, in some cases the trauma inflicted on the patient during access to the target greatly exceeds that caused by performing the therapy. Heart disease has traditionally been treated surgically using open chest techniques with the patient being placed "on pump" - i.e. their circulation being maintained by a cardio-pulmonary bypass or "heart-lung" machine.

Recently, techniques have been developed for performing minimally-invasive interventions on the heart, obviating the formerly invasive procedures that rely on pre-operative mages, combined with real-time images acquired during the procedure. Our approach is to register intra-operative images to the patient, and use a navigation system that combines intra-operative ultrasound with virtual models of instrumentation that has been introduced into the chamber through the heart wall. This presentation will illustrate the problems associated with traditional ultrasound guidance, and review the state of the art in real-time 3D cardiac ultrasound technology. In addition, it will discuss the implementation of an image-guided intervention platform that integrates real-time ultrasound with a virtual reality environment, bringing together the pre-operative anatomy derived from MRI or CT, representations of tracked instrumentation inside the heart chamber, and the intra-operatively acquired ultrasound images.

Biography: Dr. Terry Peters is a Scientist in the Imaging Research Laboratories at the Robarts Research Institute (RRI), London, ON, Canada, and Professor in the Departments of Medical Imaging and Medical Biophysics at the University of Western Ontario. He received his graduate training at the University of Canterbury in New Zealand in Electrical Engineering, where his PhD work dealt with fundamental issues in Computed Tomography image reconstruction. He is currently at the Robarts Research Institute at the University of Western Ontario, London Canada, where his research focuses on image-guided interventions, with a particular focus on the heart.

Sunday Workshops
13 February

Physics of Medical Imaging
Conference 7961

Time: 5:45 to 7:45 pm
Location: Fiesta 5 Room

Statistical Reconstruction in CT

Workshop Chair: **Norbert J. Pelc,** Stanford Univ. (USA)

Panel Members: **Kevin M. Brown,** Philips Medical Systems (USA); **Jeffrey A. Fessler,** Univ. of Michigan (USA); **Thomas G. Flohr,** Siemens Healthcare (Germany); **Jiang Hsieh,** GE Healthcare (USA); **Michael D. Silver,** Toshiba Medical Research Institute USA (USA)

While statistical image reconstruction has been used in nuclear medicine for many years, its use in x-ray computed tomography has only recently been widely explored, in part because of the large data sets in x-ray CT. However, the combination of improved computational capabilities, faster algorithms, and the desire to operate CT scanners at lower dose (therefore producing data with higher statistical noise) and to correct for system non-idealities has generated great interest in statistical reconstruction. The workshop will begin with a description of statistical reconstruction methods and their applicability to CT. It will be followed by short presentations on the methods available on commercial systems and research being done in industrial labs. A panel discussion will allow participants to explore remaining issues, including computation time, techniques to quantitatively assess the performance of statistical reconstruction methods recognizing their nonlinear nature, and the evidence thus far for clinical impact.

Visualization, Image-guided Procedures and Modeling
Conference 7964

Time: 5:45 to 7:45 pm
Location: Monterey 1-3

Toolkits and Research Interfaces for Image-Guidance and Visualization

Over the past two decade, several toolkits have been developed for processing and visualizing medical image data. Because these toolkits are robust and efficient, new investigators can quickly develop medical imaging applications rather than rebuilding existing infrastructure. At the same time, several image-guidance and robotic surgery companies have developed new research interfaces allowing scientists to connect to clinical interventional systems. As a result, imaging researchers can quickly integrate and validate new approaches in the procedure room. Unfortunately, with all of these new technologies available, it can be a challenge choosing the right technology. The intent of this workshop is to expose researchers to some of the many different toolkits and research interfaces available for conducting research in Image-guidance and Visualization.

Following the introduction of several toolkits and research interfaces by academic and commercial organizations, there will be a discussion on how the field of image-guidance can benefit from a consolidation of effort, a merging of technologies, and a standardization of communication protocols. Individuals and organizations will have the opportunity to provide perspective on the requirements for 'the toolkit of the future' along with the specification of a common interface between technologies - both hardware and software. The outcome will serve as useful survey data for both academic and industry partners.

Biomedical Applications in Molecular, Structural, and Functional Imaging
Conference 7965

Time: 5:45 to 7:45 pm
Location: Fiesta 8-10 Room

Magnetic Particle Imaging

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

Panel Members: **Jeff W. Bulte,** The Johns Hopkins Univ. (USA); **Steven Conolly,** Univ. of California, Berkeley (USA); **Kannan M. Krishnan,** Univ. of Washington (USA); **Michael H. Kuhn,** Philips Medical Systems (Germany)

Magnetic particle imaging, MPI, was introduced in 2005 and has been developing actively in several research centers around the world. Currently there are several mice systems and systems for slightly larger animals. The development has been directed toward cardiovascular applications because MPI can image in real time. MPI's high sensitivity enable alternative applications including cell tracking and antibody targeting magnetic agents. However, high sensitivity applications would require a different development path.

The panel will each provide their views of the current state of the art, limitations and suggest likely applications. The panel will then discuss the directions that are likely to be most fruitful.

Writing a Competitive NIH Application

Time: 5:45 to 8:00 pm
Location: Fiesta 1-3

Workshop Chairs: **John W. Haller** and **Marie Gill,** National Institute of Biomedical Imaging and Bioengineering (USA)

SPEAKERS: **NIH Staff and Principal Investigators**

TOPICS:

This workshop will focus on writing a high-quality grant application. Participants will acquire the knowledge and skills needed to write competitive applications for funding from the NIH. The workshop will be led by staff from the National Institutes of Health. In the first part of the workshop, informative talks will be presented by NIH staff, followed by ample time for questions and answers. Presentations will explore the peer review process, and how to structure, write, and fine-tune a competitive application for funding consideration. The second part of the workshop will include presentations by investigators who have been successful at getting NIH grants. The last part of the workshop will focus on how to write the critical Specific Aims of a high-quality application.

Topics will include:
- Effective grant writing skills
- Suggestions for early career investigators as well as seasoned grant applicants
- 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.)
- Special emphasis on Specific Aims and impact
- What to include in a cover letter
- Resubmitting your amended application

Workshops Included in Your Registration

Tuesday Workshops

15 February

Image Processing
Conference 7962
Time: 5:45 to 7:45 pm
Location: Fiesta 6 Room

Academic-Industrial Collaborations: What works, what doesn't work?

Workshop Chair: **David R. Haynor,** Univ. of Washington (USA)

Panel Members: **Mostafa Analoui,** Livingston Group (USA); **Robert L. Galloway,** Vanderbilt Univ. (USA); **Cristian Lorenz,** Philips Research Labs. (Germany); **David M. Beylin,** SBIR, National Cancer Institute (USA)

This workshop features four panelists, all with experience in academic-industrial collaborations in medical applications, who will discuss a broad range of topics related to the success/failure of these projects. Topics include: What should be the proper functions of a university tech-transfer office, and do they perform those tasks well? What are the pros and cons of licensing to an industrial partner vs. development by a university spinoff? How do companies decide what inventions are worth developing, and how do they decide how much effort is appropriate? Are university inventions generally in a state for immediate commercialization, or do they require further development? Are present funding arrangements for small businesses (SBIR, STTR) adequate for collaboration and business development? Do funding agencies adequately support translational, rather than basic, research?

Computer-Aided Diagnosis
Conference 7963
Time: 5:45 to 7:45 pm
Location: Veracruz C

CAD Demonstration

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

This year's CAD workshop will continue the successful workshops organized at the previous meetings. Live demonstrations will be given by teams of CAD developers from mammography, lung CT, colon CT and others, showing their computer-aided detection and/or computer-aided diagnosis systems.

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

New this year, the workshop website will provide links to publicly available dataset and encourage the use of those data in the demonstrations. Researchers will be encouraged to make their own data publicly available, and the website will be updated as new datasets are submitted. Participation in this public data component of the workshop is purely voluntary. We anticipate that the impact of this open-data effort will grow over the years.

This workshop provides a unique opportunity to see and experience how advanced CAD systems perform and to discuss their design and use with developers. For more information, visit the workshop Web site.

Image Perception, Observer Performance, and Technology Assessment
Conference 7966
Time: 5:45 to 7:45 pm
Location: Monterey 1-3

Device Evaluation: Perspectives from Inside and Outside the FDA

Panel Moderator: **Claudia R. Mello-Thoms,** Univ. of Pittsburgh Cancer Institute (USA)

Panel Members: **David Fisher,** Medical Imaging & Technology Aliance, NEMA (USA); **Elizabeth A. Krupinski,** The Univ. of Arizona (USA); **Robert M. Nishikawa,** The Univ. of Chicago (USA); **Robert A. Ochs,** Univ. of California, Los Angeles (USA); **Mary S. Pastel,** U.S. Food and Drug Administration (USA); **Nicholas A. Petrick,** U.S. Food and Drug Administration (USA)

The process by which medical devices are evaluated by the US Food and Drug Administration can be a little confusing to those outside the agency, even for professionals with great experience. In this workshop, a panel of experts from both inside and outside the FDA will discuss their perspectives on the scientific principles and methodologies behind the evaluation process. For approval of new medical devices, understanding of the entire process is crucial, as the US FDA is charged with the task of evaluating safety and effectiveness of new devices on the basis of "valid scientific evidence."

Panelists in this workshop include experts from several different branches of the FDA, academic scholars who have served as scientific members in FDA Advisory Committees, and representatives from industry.

Advanced PACS-based Imaging Informatics and Therapeutic Applications
Conference 7967
Time: 5:45 to 7:45 pm
Location: Fiesta 8-10 Room

DICOM

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.

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

Photo courtesy of Ken Hanson

Poster Awards

Poster Awards in Conference Rooms
Check conference schedules for times and locations.

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. Check 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:
1. 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.
2. 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.
3. A conference may give preference to first authors who are students or who are within five years of their terminal degrees.

Poster Session Information

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

SUNDAY/MONDAY POSTER SESSION

Poster presentations from the Image Processing; Visualization, Image-guided Procedures, and Modeling; Biomedical Applications in Molecular, Structural, and Functional Imaging; and Ultrasonic Imaging, Tomography, and Therapy conferences will be included.

Author Set-up Time: Sunday from noon to 1:30 pm. Posters should remain on display until the end of the Interactive Poster Session on Monday.

Interactive Poster Session and Reception:
Monday from 5:00 to 6:30 pm

TUESDAY/WEDNESDAY POSTER SESSION

Poster presentations from the Physics of Medical Imaging; Computer-Aided Diagnosis; Image Perception, Observer Performance, and Technology Assessment; Advanced PACS-based Imaging Informatics and Therapeutic Applications conferences will be included.

Author Set-up Time: Tuesday from 9:40 to 10:10 am. Posters should remain on display until the end of the interactive poster session on Wednesday.

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

Dessert with the Experts

A Student Networking Event

Monday 14 February · 6:30 to 7:30 pm

FREE
Students receive one complimentary ticket with registration.

See ticket for location.
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. Students receive one free ticket with registration.

Women's Networking Lunch

Tuesday 15 February · 12:10 to 1:20 pm

Lunch tickets required. Sign-up at registration required before coffee break on Tuesday.

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

Meet with NIH Staff

Monday 14 February and
Wednesday 16 February · 12:15 to 1:20 pm
Location: Yucatan 2

No lunch will be served.

There will be two sessions where investigators will be able 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

SPECIAL SESSION:
Radiation Dose

NEW

Thursday 17 February · 8:00 am to 12:10 pm

SPECIAL THIS YEAR: The Physics of Medical Imaging Conference (7961) is offering a special session on radiation dose in medical imaging. The session, jointly sponsored by the AAPM (American Association of Physicists in Medicine) and SPIE, focuses primarily on CT imaging and addresses issues pertaining the risk and quality of CT imaging procedures with special attention to efforts to optimize protocols towards superior image quality and dose performance. A combination of invited and proffered abstracts include basic definitions and outlook of CT dose, biological effects of low levels of radiation, methods for dose and risk assessment and monitoring, evidence-based optimization of image quality and dose, advanced reconstruction methods aimed to reduce radiation dose, and clinical optimization of CT protocols. The session concludes with a panel discussion aimed to distill the unresolved issues and the issues that require future work.

Co-Sponsored by:

AAPM   SPIE

SPIE COURSES

Relevant training, proven instructors

GET THE TRAINING YOU NEED at SPIE Medical Imaging. The 2011 program features 13 courses and workshops, including new courses on Graph Algorithmic Techniques for Segmentation, Introduction to ImageJ, and Statistics of Medical Imaging, and the new workshop Medical Imaging: From Concept to Market to learn the key steps involved in commercializing a medical imaging innovation.

Earn Course Credits: SPIE has applied to offer MPCECs (Medical Physics Continuing Education Credits) for its courses at Medical Imaging 2011. If you attend one of our Medical Imaging courses, meet CAMPEP's qualifications, and SPIE is approved, you may apply for these credits at no charge. CAMPEP is a continuing professional education accreditation organization specific to the medical imaging community.

Statistics of Medical Imaging SC1025 **NEW**
Course level: Intermediate
CEU .65
SPIE Member $510/Non-member $600 USD
Saturday 8:30 am to 5:30 pm
Instructor: **Tianhu Lei**

Introduction to ImageJ with Applications to Image Processing and Image Analysis SC1028 **NEW**
Course level: Introductory
CEU .35
SPIE Member $310/Non-member $360 USD
Saturday 8:30 am to 12:30 pm
Instructor: **Richard VanMetter**

Fundamentals of Medical Image Processing and Analysis SC086
Course level: Intermediate
CEU .65
SPIE Member $510/Non-member $600 USD
Saturday 8:30 am to 5:30 pm
Instructor: **Thomas Deserno**

Graph Algorithmic Techniques for Biomedical Image Segmentation SC1026 **NEW**
Course level: Intermediate
CEU .35
SPIE Member $310/Non-member $360 USD
Saturday 1:30 to 5:30 pm
Instructors: **Mona (Haecker) Garvin** and **Xiaodong Wu**

MIC-GPU: High-Performance Computing for Medical Imaging on Programmable Graphics Hardware (GPU) SC829
Course level: Intermediate
CEU .35
SPIE Member $310/Non-member $360 USD
Saturday 1:30 to 5:30 pm
Instructor: **Klaus Mueller** and **Fang Xu**

Writing for Publication in Medical Imaging WS776
Course level: Introductory
CEU .35
SPIE Member $100/Non-member $150 USD
Saturday 1:30 to 5:30 pm
Instructor: **Kenneth Hanson**

Exact Cone Beam Reconstruction: Theory and Practice SC939
Course level: Intermediate
CEU .35
SPIE Member $310/Non-member $360 USD
Sunday 8:30 am to 12:30 pm
Instructors: **Alexander Katsevich** and **Alexander Zamyatin**

Principles and Advancements in X-ray Computed Tomography SC471
Course level: Introductory
CEU .35
SPIE Member $400/Non-member $450 USD
Sunday 8:30 am to 12:30 pm
Instructor: **Jiang Hsieh**

Medical Imaging: From Concept to Market WS1024 **NEW**
Course level: Introductory
CEU .35
SPIE Member $250/Non-member $300 USD
Sunday 1:30 to 5:30 pm
Instructor: **Mostafa Analoui**

Spectral CT Imaging SC987
Course level: Intermediate
CEU .35
SPIE Member $310/Non-member $360 USD
Sunday 1:30 to 5:30 pm
Instructors: **Björn Heismann**, **Bernhard Schmidt** and **Thomas Flohr**.

X-Ray Detector Performance: Principles and Measurements using a Linear Systems Approach SC358
Course level: Advanced
CEU .35
SPIE Member $310/Non-member $360 USD
Sunday 1:30 to 5:30 pm
Instructor: **Ian Cunningham**

Statistical Methods in Medical Imaging and Bioengineering with Applications to Observer Performance Evaluation SC613
Course level: Intermediate
CEU .65
SPIE Member $510/Non-member $600 USD
Monday 8:30 am to 5:30 pm
Instructors: **Dev Chakraborty** and **Elizabeth Krupinski**

Early Career Professional Development in Medical Imaging WS757
Course level: Introductory
SPIE Member $100/Non-member $150 USD
Tuesday 1:30 to 5:30 pm
Instructor: **Elizabeth Krupinski**

**Registration Required.
See SPIE Cashier to register.**

Technical Conferences

Conference 7961
Room: Fiesta 5

Sunday-Thursday 13-17 Feb. 2011
Proceedings of SPIE Vol. 7961

Physics of Medical Imaging

Conference Chairs: **Norbert J. Pelc,** Stanford Univ.; **Ehsan Samei,** Duke Univ.*Conference Co-Chair:* **Robert M. Nishikawa,** The Univ. of Chicago

Program Committee: **Guang-Hong Chen,** Univ. of Wisconsin-Madison; **Dianna D. Cody,** The Univ. of Texas M.D. Anderson Cancer Ctr.; **Mats Danielsson,** Royal Institute of Technology (Sweden); **Maria Drangova,** Robarts Research Institute (Canada); **Thomas Flohr,** Siemens Healthcare (Germany); **Stephen J. Glick,** Univ. of Massachusetts Medical School; **Michael Grass,** Philips Technologie GmbH (Germany); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany); **Marc Kachelrieß,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Karim S. Karim,** Univ. of Waterloo (Canada); **Hee-Joung Kim,** Yonsei Univ. (Korea, Republic of); **Despina Kontos,** The Univ. of Pennsylvania Health System; **Iacovos S. Kyprianou,** U.S. Food and Drug Administration; **Jinyi Qi,** Univ. of California, Davis; **John A. Rowlands,** Thunder Bay Regional Health Sciences Ctr. (Canada); **John M. Sabol,** GE Healthcare; **Taly Gilat Schmidt,** Marquette Univ.; **Jeffrey H. Siewerdsen,** The Johns Hopkins Univ.; **Katsuyuki Taguchi,** The Johns Hopkins Outpatient Ctr.; **Anders Tingberg,** Skåne Univ. Hospital, Malmö (Sweden); **Bruce R. Whiting,** Washington Univ. in St. Louis; **John Yorkston,** Carestream Health, Inc.

Posters for this conference will be on display Tuesday and Wednesday in the Veracruz C. 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. See Technical Events for additional information.

Conference 7962
Rooms: Fiesta 6

Monday-Wednesday 14-16 Feb. 2011
Proceedings of SPIE Vol. 7962

Image Processing

Conference Chairs: **Benoit M. Dawant,** Vanderbilt Univ.; **David R. Haynor,** Univ. of Washington

Program Committee: **Mostafa Analoui,** The Livingston Group; **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr.; **Christian Barillot,** Institut de Recherche en Informatique et Systèmes Aléatoires (France); **Baowei Fei,** Emory Univ.; **Aaron Fenster,** Robarts Research Institute (Canada); **Bernd Fischer,** Univ. zu Lübeck (Germany); **Alejandro Federico Frangi,** Univ. Pompeu Fabra (Spain); **Mona K. Garvin,** The Univ. of Iowa; **James C. Gee,** Univ. of Pennsylvania; **Guido Gerig,** The Univ. of Utah; **Tobias Heimann,** Deutsches Krebsforschungszentrum (Germany); **Tianhu Lei,** The Children's Hospital of Philadelphia; **Boudewijn P. F. Lelieveldt,** Leids Univ. Medisch Ctr. (Netherlands); **Boštjan Likar,** Univ. of Ljubljana (Slovenia); **Murray H. Loew,** The George Washington Univ.; **Cristian Lorenz,** Philips Research (Germany); **Frederik Maes,** Katholieke Univ. Leuven (Belgium); **Vincent A. Magnotta,** The Univ. of Iowa Hospitals and Clinics; **Sunanda D. Mitra,** Texas Tech Univ.; **Kensaku Mori,** Nagoya Univ. (Japan); **Nassir Navab,** Technische Univ. München (Germany); **Mads Nielsen,** Univ. of Copenhagen (Denmark); **Wiro J. Niessen,** Erasmus MC (Netherlands); **Sébastien Ourselin,** Univ. College London (UK); **Josien P. W. Pluim,** Univ. Medical Ctr. Utrecht (Netherlands); **Daniel Rueckert,** Imperial College London (UK); **Punam K. Saha,** The Univ. of Iowa; **Olivier Salvado,** Commonwealth Scientific and Industrial Research Organisation (Australia); **Julia A. Schnabel,** Univ. of Oxford (UK); **Colin Studholme,** Univ. of California, San Francisco; **Martin A. Styner,** The Univ. of North Carolina at Chapel Hill; **Philippe Thévenaz,** Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Jayaram K. Udupa,** The Univ. of Pennsylvania Health System; **Andreas Wahle,** The Univ. of Iowa

Posters for this conference will be on display Sunday and Monday in the Veracruz C. The interactive poster session with authors in attendance will be Monday evening from 5:00 to 6:30 pm. Poster awards will be announced in the conference meeting room on Tuesday morning. See Technical Events for additional information.

Conference 7963
Room: Fiesta 1-3

Tuesday -Thursday 15-17 Feb. 2011
Proceedings of SPIE Vol. 7963

Computer-Aided Diagnosis

Conference Chairs: **Ronald M. Summers,** National Institutes of Health; **Bram van Ginneken,** Univ. Medical Ctr. Utrecht (Netherlands)

Program Committee: **Samuel G. Armato III,** The Univ. of Chicago; **Susan M. Astley,** The Univ. of Manchester (UK); **Stephen R. Aylward,** Kitware, Inc.; **Kyongtae Ty Bae,** Univ. of Pittsburgh Medical Ctr.; **Heang-Ping Chan,** Univ. of Michigan Health System; **Marleen de Bruijne,** Copenhagen Univ. (Denmark); **Thomas M. Deserno,** RWTH Aachen Univ. (Germany); **Hiroshi Fujita,** Gifu Univ. (Japan); **Hayit Greenspan,** Tel Aviv Univ. (Israel); **Horst Karl Hahn,** Fraunhofer MEVIS (Germany); **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.; **Michael F. McNitt-Gray,** Univ. of California, Los Angeles; **Kensaku Mori,** Nagoya Univ. (Japan); **Janne J. Näppi,** Massachusetts General Hospital; **Meindert Niemeijer,** Univ. Medical Ctr. Utrecht (Netherlands); **Noboru Niki,** Univ. of Tokushima (Japan); **Carol L. Novak,** Siemens Corporate Research; **Nicholas A. Petrick,** U.S. Food and Drug Administration; **Kenji Suzuki,** The Univ. of Chicago; **Georgia D. Tourassi,** Duke Univ.; **Rafael Wiemker,** Philips Research (Germany); **Axel Wismueller,** Univ. of Rochester Medical Ctr.

Posters for this conference will be on display Tuesday and Wednesday in the Veracruz C. 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. See Technical Events for additional information.

Conference 7964
Room: Monterey 1-3

Sunday-Tuesday 13-15 Feb. 2011
Proceedings of SPIE Vol. 7964

Visualization, Image-guided Procedures and Modeling

Conference Chairs: **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ.; **David R. Holmes III,** Mayo Clinic

Program Committee: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Wolfgang Birkfellner,** Medizinische Univ. Wien (Austria); **Kevin R. Cleary,** Georgetown Univ. Medical Ctr.; **Alexandre X. Falcão,** Univ. Estadual de Campinas (Brazil); **Baowei Fei,** Emory Univ.; **Gabor Fichtinger,** Queen's Univ. (Canada); **Robert L. Galloway, Jr.,** Vanderbilt Univ.; **George J. Grevera,** Saint Joseph's Univ.; **Steven L. Hartmann,** Medtronic Navigation; **David R. Haynor,** Univ. of Washington; **William E. Higgins,** The Pennsylvania State Univ.; **Pierre Jannin,** Univ. de Rennes 1 (France); **Michael I. Miga,** Vanderbilt Univ.; **Terry M. Peters,** Robarts Research Institute (Canada); **Frank Sauer,** Siemens Corporate Research; **Eric J. Seibel,** Univ. of Washington; **Guy Shechter,** Philips Medical Systems; **Jayaram K. Udupa,** The Univ. of Pennsylvania Health System; **Robert J. Webster III,** Vanderbilt Univ.; **Jay B. West,** Accuray, Inc.; **Ivo Wolf,** Deutsches Krebsforschungszentrum (Germany); **Ziv R. Yaniv,** Georgetown Univ.

Posters for this conference will be on display Sunday and Monday in the Veracruz C. The interactive poster session with authors in attendance will be Monday evening from 5:00 to 6:30 pm. Poster awards will be announced in the conference meeting room on Tuesday morning. See Technical Events for additional information.

Conference 7965
Room: Fiesta 8-10

Sunday-Wednesday 13-16 Feb. 2011
Proceedings of SPIE Vol. 7965

Biomedical Applications in Molecular, Structural, and Functional Imaging

Conference Chairs: **John B. Weaver,** Dartmouth Hitchcock Medical Ctr.; **Robert C. Molthen,** Medical College of Wisconsin

Program Committee: **Amir A. Amini,** Univ. of Louisville; **Thorsten M. Buzug,** Univ. zu Lübeck (Germany); **Juan R. Cebral,** George Mason Univ.; **Yu Chen,** Univ. of Maryland, College Park; **Anne Clough,** Marquette Univ.; **Andreas H. Hielscher,** Columbia Univ.; **Eric A. Hoffman,** The Univ. of Iowa Hospitals and Clinics; **Xiaoping P. Hu,** Emory Univ.; **John F. LaDisa,** Marquette Univ.; **Armando Manduca,** Mayo Clinic College of Medicine; **Erik Ritman,** Mayo Clinic College of Medicine; **Merryn H. Tawhai,** The Univ. of Auckland (New Zealand); **Axel Wismueller,** Univ. of Rochester Medical Ctr.

Posters for this conference will be on display Sunday and Monday in the Veracruz C. The interactive poster session with authors in attendance will be Monday evening from 5:00 to 6:30 pm. Poster awards will be announced in the conference meeting room on Tuesday morning. See Technical Events for additional information.

Conference 7966

Room: Monterey 1-3

Wednesday-Thursday 16-17 Feb. 2011
Proceedings of SPIE Vol. 7966

Image Perception, Observer Performance, and Technology Assessment

Conference Chairs: **David J. Manning,** Lancaster Univ. (UK); **Craig K. Abbey,** Univ. of California, Santa Barbara

Program Committee: **Kevin S. Berbaum,** The Univ. of Iowa Hospitals and Clinics; **Darrin C. Edwards,** The Univ. of Chicago; **Brandon D. Gallas,** U.S. Food and Drug Administration; **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona; **Anthony J. Maeder,** Univ. of Western Sydney (Australia); **Claudia R. Mello-Thoms,** Univ. of Pittsburgh Cancer Institute; **Berkman Sahiner,** U.S. Food and Drug Administration; **David L. Wilson,** Case Western Reserve Uni

WORKSHOP
Device Evaluation— Perspectives from Inside and Outside the FDA

Monterey 1-3 Room · Tues. 5:45 to 7:45 pm

For details see page 9.

Posters for this conference will be on display Tuesday and Wednesday in the Veracruz C. 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. See Technical Events for additional information.

Conference 7967

Room: Fiesta 8-10

Wednesday-Thursday 16-17 Feb. 2011
Proceedings of SPIE Vol. 7967

Advanced PACS-based Imaging Informatics and Therapeutic Applications

Conference Chairs: **William Boonn,** Hospital of the Univ. of Pennsylvania; **Brent J. Liu,** The Univ. of Southern California

Program Committee: **Katherine P. Andriole,** Harvard Medical School; **Kevin R. Cleary,** Georgetown Univ. Medical Ctr.; **Janice C. Honeyman-Buck,** Univ. of Florida; **Steven C. Horii,** The Univ. of Pennsylvania Health System; **Woojin Kim,** The Univ. of Pennsylvania Health System; **Maria Y. Y. Law,** The Hong Kong Polytechnic Univ. (Hong Kong, China); **Heinz U. Lemke,** Computer Assisted Radiology and Surgery (Germany); **Khan M. Siddiqui,** Microsoft Corp.; **Eliot L. Siegel,** Univ. of Maryland Medical Ctr.; **John B. Strauss,** Microscoft Corp. Imaging Solutions Consultant; **Wyatt Tellis,** Univ. of California, San Francisco; **Jianguo Zhang,** Shanghai Institute of Technical Physics (China); **Stefan L. Zimmerman,** The Johns Hopkins Univ. Hospital

WORKSHOP
DICOM

Fiesta 8-10 Room · Tues. 5:45 to 7:45 pm

For details see page 9.

Posters for this conference will be on display Tuesday and Wednesday in the Veracruz C. 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. See Technical Events for additional information.

Conference 7968

Room: Fiesta 1-3

Sunday-Monday 13-14 Feb. 2011
Proceedings of SPIE Vol. 7968

Ultrasonic Imaging and Signal Processing

Conference Chairs: **Jan D'hooge,** Katholieke Univ. Leuven (Belgium); **Marvin M. Doyley,** Univ. of Rochester

Program Committee: **Jeffrey C. Bamber,** Univ. of London (UK); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands); **Stanislav Y. Emelianov,** The Univ. of Texas at Austin; **James F. Greenleaf,** Mayo Clinic; **Michael F. Insana,** Univ. of Illinois at Urbana-Champaign; **Stephen A. McAleavey,** Univ. of Rochester; **Jørgen A. Jensen,** Technical Univ. of Denmark (Denmark); **K. Kirk Shung,** The Univ. of Southern California; **Kai E. Thomenius,** General Electric Co.; **William F. Walker,** Univ. of Virginia

Posters for this conference will be on display Sunday and Monday in the Veracruz C. The interactive poster session with authors in attendance will be Monday evening from 5:00 to 6:30 pm. Poster awards will be announced in the conference meeting room on Tuesday morning. See Technical Events for additional information.

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 1

Room: Fiesta 5 . . . . Sun. 8:00 to 9:40 am

Keynote and Imaging and Health Economics

Session Chairs: **Norbert J. Pelc,** Stanford Univ.; **Ehsan Samei,** Duke Univ.

8:00 am: **Economics in medical imaging** (*Kyenote Presentation*), James H. Thrall M.D., Massachusetts General Hospital (USA) . . . . [7961-01]

8:50 am: **Lateral organic photodetectors for imaging applications**, Umar Sahfique, Karim S. Karim, Univ. of Waterloo (Canada). . . . . [7961-02]

9:10 am: **Design and optimization of a dedicated cone-beam CT system for musculoskeletal extremities imaging**, Wojtek Zbijewski, Paul DeJean, Prakhar Prakash, Yifu Ding, Joseph W. Stayman, The Johns Hopkins Univ. (USA); Nathan Packard, Robert Senn, Dong Yang, John Yorkston, Carestream Health, Inc. (USA); Antonio Machado, John Carrino, Jeffrey H. Siewerdsen, The Johns Hopkins Univ. (USA) . . [7961-03]

9:30 am: **NIBIB programs for low cost imaging devices** (*Invited Paper*), John W. Haller, National Institute of Biomedical Imaging and Bioengineering (USA) . . . . [7961-04]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

SESSION 1

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

Image Guided Therapy I

Session Chairs: **Eric J. Seibel,** Univ. of Washington; **Kevin R. Cleary,** Georgetown Univ. Medical Ctr.

8:00 am: **The use of virtual fiducials in image-guided kidney surgery**, Robert L. Galloway, Jr., Courtenay L. Glisson, Rowena E. Ong, Vanderbilt Univ. (USA) . . . .[7964-01]

8:20 am: **Surgical phantom for off-pump mitral valve replacement**, Angus J. McLeod, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); John Moore, Robarts Research Institute (Canada); Gerard M. Guiraudon, Lawson Health Research Institute (Canada) and Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Doug L. Jones, The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada) and Robarts Research Institute (Canada); Gordon Campbell, National Research Council Canada (Canada) and The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); Terry M. Peters, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) . . . .[7964-02]

8:40 am: **Deformable registration for cone-beam CT-guided surgery: modified Demons for excised tissue**, Sajendra Nithiananthan, Daniel Mirota, Ali Uneri, Sebastian Schafer, Yoshito Otake, Webster Stayman, Jeffrey Siewerdsen, The Johns Hopkins Univ. (USA) . . . .[7964-03]

9:00 am: **Evaluation of an ad hoc model of detection physics for navigated beta-probe surface imaging**, Dzhoshkun I. Shakir, Alexander Hartl, Nassir Navab, Sibylle I. Ziegler, Technische Univ. München (Germany) . . . .[7964-04]

9:20 am: **Computer assisted intervention surgery planning and navigation for percutaneous microwave ablation of lung cancer**, Weiming Zhai, Lin Sheng, Yixu Song, Hong Wang, Yannan Zhao, Peifa Jia, Tsinghua Univ. (China) . . . .[7964-05]

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

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

SESSION 1

Room: Fiesta 8-10. . . . . Sun. 8:00 to 9:40 am

Brain Imaging I: fMRI

Session Chairs: **Amir A. Amini,** Univ. of Louisville; **Axel Wismueller,** Univ. of Rochester Medical Ctr.

8:00 am: **Characteristics of voxel prediction power in full-brain Granger causality analysis of fMRI data**, Rahul Garg, A. Ravishankar Rao, Guillermo A. Cecchi, IBM Thomas J. Watson Research Ctr. (USA) . .[7965-01]

8:20 am: **A methodology for dynamic functional connectivity**, Tianhu Lei, John Dell, Timothy P. L. Roberts, The Children's Hospital of Philadelphia (USA) . . . .[7965-02]

8:40 am: **Effective connectivity of neural pathways underlying disgust by multivariate Granger causality analysis**, Hao Yan, Sr., Shaanxi Normal Univ. (China) and Xidian Univ. (China) and Peking Univ. (China); Yonghui Wang, Sr., Shaanxi Normal Univ. (China); Jie Tian, Sr., Institute of Automation (China); Yijun Liu, Sr., Peking Univ. (China) . . . .[7965-03]

9:00 am: **The neural correlates of face processing and Chinese character processing in children**, Jiangang Liu, Beijing Jiaotong Univ. (China); Lu Zi Feng M.D., Institute of Automation (China); Ling Li, Beijing Jiaotong Univ. (China); Jie Tian, Sr., Institute of Automation (China) . . . .[7965-04]

9:20 am: **Learn the effective connectivity pattern of attention networks: a resting functional MRI and Bayesian network study**, Juan Li, Rui Li, Li Yao, Xia Wu, Beijing Normal Univ. (China) . . . .[7965-05]

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

Conference 7968 continued
Ultrasonic Imaging and Signal Processing
Room: Fiesta 1-3

SESSION 1

Room: Fiesta 1-3. . . . . Sun. 8:00 to 9:40 am

New Developments in Ultrasound Tomography

Session Chair: **Kai E. Thomenius,** General Electric Co.

8:00 am: **Double difference tomography for breast ultrasound sound speed imaging**, Cuiping Li, Nebojsa Duric, Olsi Rama, Angelika Burger, Lisa Polin, Nicole Nechiporchik, Karmanos Cancer Institute (USA) . . . .[7968-01]

8:20 am: **Evaluation of the Bresenham algorithm for image reconstruction with ultrasound computer tomography**, Norbert Spiess, Michael Zapf, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany) . . . .[7968-02]

8:40 am: **Modification of Kirchhoff migration with variable sound speed and attenuation for tomographic imaging of the breast**, Steven P. Schmidt, Olivier Roy, Cuiping Li, Nebojsa Duric, Karmanos Cancer Institute (USA); Zhi-Feng Huang, Wayne State Univ. (USA). . . . .[7968-03]

9:00 am: **Realization of an optimized 3D USCT**, Nicole V. Ruiter, Georg Göbel, Lutz Berger, Michael Zapf, Hartmut Gemmeke, Karlsruher Institut für Technologie (Germany) . . . .[7968-04]

9:20 am: **Robust array calibration using time delays with application to ultrasound tomography**, Olivier Roy, Karmanos Cancer Institute (USA); Ivana Jovanovic, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Nebojsa Duric, Karmanos Cancer Institute (USA); Louis Poulo, Analogic Corp. (USA); Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . .[7968-05]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

Conference 7968 continued
Ultrasonic Imaging and Signal Processing
Room: Fiesta 1-3

SESSION 2
Room: Fiesta 5 . . . . . . Sun. 10:10 am to 12:10 pm

X-ray Imaging

Session Chairs: **John A. Rowlands,** Thunder Bay Regional Health Sciences Ctr. (Canada); **Christoph Hoeschen,** Helmholtz Zentrum München GmbH (Germany)

10:10 am: **A laser-driven undulator x-ray source: simulation of image formation and dose deposition in mammography**, Bernhard Müller, Ludwig-Maximilians-Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); Helmut Schlattl, Helmholtz Zentrum München GmbH (Germany); Florian J. Grüner, Ludwig-Maximilians-Univ. München (Germany); Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany). . . . .[7961-05]

10:30 am: **The case for single-exposure angiography using energy-resolving photon-counting detectors: a theoretical comparison of signal and noise with conventional subtraction angiography**, Jesse Tanguay, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Ho Kyung Kim, Pusan National Univ. (Korea, Republic of); Ian A. Cunningham, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada). . . . .[7961-06]

10:50 am: **Electron field emission PIC coupled with MCNPX simulation of a CNT-based flat-panel x-ray source**, Hyoung-Koo Lee, Chrystian M. Posada, Edwin J. Grant, Carlos H. Castano, Missouri Univ. of Science and Technology (USA). . . . .[7961-07]

11:10 am: **CBCT Monte Carlo analysis: compensator design for scatter distribution minimization**, Gregory J. Bootsma, Univ. of Toronto (Canada); Frank Verhaegen, Maastricht Univ. (Netherlands); David A. Jaffray, Univ. Health Network (Canada) . . . . . .[7961-08]

11:30 am: **Correlated-polarity noise reduction: feasibility of a new statistical approach to reduce image noise**, James T. Dobbins III, Duke Univ. (USA) and Duke Univ. Medical Ctr. (USA); Jered R. Wells, Duke Univ. Medical Ctr. (USA) . . . .[7961-133]

11:50 am: **Optimization of the grid frequencies and angles in digital radiography imaging**, Dong Sik Kim, Hankuk Univ. of Foreign Studies (Korea, Republic of); Sanggyun Lee, Drtech Co. (Korea, Republic of)[7961-10]

Lunch Break .12:10 to 1:20 pm

SESSION 2
Room: Monterey 1-3 . Sun. 10:10 am to 12:10 pm

Keynote and Image Guidance in Urology

Session Chairs: **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ.; **David R. Holmes III,** Mayo Clinic

10:10 am: **Engineering solutions in the operating room: a surgeon's perspective** *(Keynote Presentation)*, S. D. Herrell, Vanderbilt Univ. (USA) . . . .[7964-06]

11:10 am: **2D and 3D visualization methods of endoscopic panoramic bladder images**, Alexander Behrens, Iris Heisterklaus, Yannick Müller, Thomas Stehle, Sebastian Gross, Til Aach, RWTH Aachen (Germany) . . . .[7964-07]

11:30 am: **Real time photoacoustic imaging of prostate brachytherapy seeds in ex vivo prostate**, Nathanael Kuo, Hyun-Jae Kang, Travis DeJournett, Danny Song, The Johns Hopkins Univ. (USA); Emad Boctor, The Johns Hopkins Outpatient Ctr. (USA); Jerry L. Prince, The Johns Hopkins Univ. (USA) . . . .[7964-08]

11:50 am: **Optimal drug release schedule of in-situ radiosensitization of image guided permanent prostate brachytherapy**, Robert A. Cormack, Paul Nguyen, Anthony V. D'Amico, Harvard Medical School (USA); Sri Sridhar, Northeastern Univ. (USA); Mike Makrigioros, Harvard Medical School (USA). . .[7964-09]

Lunch Break .12:10 to 1:20 pm

SESSION 2
Room: Fiesta 8-10. . . . Sun. 10:10 am to 12:10 pm

Optical Imaging I

Session Chairs: **Andreas H. Hielscher,** Columbia Univ.; **Yu Chen,** Univ. of Maryland, College Park

10:10 am: **Automatic localization of bifurcations and vessel crossings in digital fundus photographs using location regression**, Meindert Niemeijer, Alina V. Dumitrescu, The Univ. of Iowa Hospitals and Clinics (USA); Bram van Ginneken, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Michael D. Abramoff, The Univ. of Iowa Hospitals and Clinics (USA). . . . .[7965-06]

10:30 am: **Normal and keratoconic corneal epithelial thickness mapping using Fourier-domain optical coherence tomography**, Yan Li, Ou Tan, David M. Huang M.D., Oregon Health & Science Univ. (USA) . . . .[7965-07]

10:50 am: **Estimation of blood flow rate using intensity signal in optical coherence tomography**, Nishant Mohan, Benjamin J. Vakoc, Massachusetts General Hospital (USA) . . . .[7965-08]

11:10 am: **Deconvolution of dynamic dual photon microscopy images of cerebral microvasculature to assess the hemodynamic status of the brain**, Hatef Mehrabian, Liis Lindvere, Bojana Stefanovic, Anne L. Martel, Sunnybrook Health Sciences Ctr. (Canada) . . . .[7965-09]

11:30 am: **Three-dimensional multi bioluminescent sources reconstruction based on adaptive finite element method**, Xibo Ma, Jie Tian, Institute of Automation (China); Bo Zhang, Northeastern Univ. (China); Xing Zhang, Zhenwen Xue, Di Dong, Dong Han, Institute of Automation (China) . . . .[7965-10]

11:50 am: **In vivo heterogeneous tomographic bioluminescence imaging via a higher-order approximation forward model**, Kai Liu, Jie Tian, Sr., Chenghu Qin, Xin Yang, Dong Han, Shouping Zhu, Ping Wu, Institute of Automation (China). . . . .[7965-11]

Lunch Break .12:10 to 1:20 pm

SESSION 2
Room: Fiesta 1-3. . . . . Sun. 10:10 am to 12:10 pm

Novel Imaging Devices and Approaches

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

10:10 am: **The development of a combined b-mode, ARFI, and spectral Doppler ultrasound imaging system for investigating cardiovascular stiffness and hemodynamics**, Joshua R. Doherty, Douglas M. Dumont, Gregg E. Trahey, Duke Univ. (USA) . .[7968-06]

10:30 am: **Single pulse frequency compounding protocol for superharmonic imaging**, Mikhail G. Danilouchkine, Paul van Neer, Guillaume Matte, Erasmus MC (Netherlands); Martin Verweij, Technische Univ. Delft (Netherlands); Nico de Jong, Erasmus MC (Netherlands) . . . .[7968-07]

10:50 am: **A novel imaging technique based on the spatial coherence of backscattered waves: demonstration in the presence of acoustical clutter**, Jeremy J. Dahl, Duke Univ. (USA); Gianmarco F. Pinton, Ecole Supérieure de Physique et de Chimie Industrielles (France); Muyinatu A. Lediju, Gregg E. Trahey, Duke Univ. (USA) . . . .[7968-08]

11:10 am: **Using high-power light emitting diodes for photoacoustic imaging**, René S. Hansen, Univ. of Southern Denmark (Denmark) . . . .[7968-09]

11:30 am: **Photoacoustic tomography with integrating fiber-based annular detectors**, Hubert Grün, Halit Altmisdört, Thomas Berer, RECENDT GmbH (Austria); Gerhard Zangerl, Markus Haltmeier, Otmar Scherzer, Univ. Wien (Austria); Günther Paltauf, Karl-Franzens-Univ. Graz (Austria); Peter Burgholzer, RECENDT GmbH (Austria) . . . .[7968-10]

11:50 am: **Development of a c-scan photoacoutsic imaging probe for prostate cancer detection**, Keerthi S. Valluru, Bhargava K. Chinni, Univ. of Rochester Medical Ctr. (USA); Navalgund A. Rao, Rochester Institute of Technology (USA); Shweta Bhatt, Vikram S. Dogra, Univ. of Rochester Medical Ctr. (USA) .[7968-11]

Lunch Break .12:10 to 1:20 pm

Conference 7961 continued
Physics of Medical Imaging

Room: Fiesta 5

SESSION 3

Room: Fiesta 5 . . . . Sun. 1:20 to 3:00 pm

Metrology

Session Chairs: **Robert M. Nishikawa,** The Univ. of Chicago; **John Yorkston,** Carestream Health Technology and Innovation Ctr.

1:20 pm: **A novel method to measure the zero-frequency DQE value of both linear and non-linear x-ray imaging systems**, Michael McDonald, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada); Ian A. Cunningham, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Ho Kyung Kim, Pusan National Univ. (Korea, Republic of) and Robarts Research Institute (Canada) . . . .[7961-11]

1:40 pm: **Use of sphere phantoms to measure the 3D MTF of FDK reconstructions**, Jongduk Baek, Norbert J. Pelc, Stanford Univ. (USA). . . . .[7961-12]

2:00 pm: **Three-dimensional noise-power spectrum applied on clinical MDCT and CBCT scanners: effects of reconstruction algorithms and reconstruction filters**, Frédéric A. Miéville, Mohamed Benkreira, Univ. Hospital Ctr. (Switzerland) and Univ. of Lausanne (Switzerland); Gregory Bolard, Genolier Clinique (Switzerland); Paul Ayestaran, General Electric Medical Systems Europe (France); François Gudinchet, François Bochud, Francis R. Verdun, Univ. Hospital Ctr. (Switzerland) and Univ. of Lausanne (Switzerland) . . . .[7961-13]

2:20 pm: **NPS comparison of anatomical noise characteristics in mammography, tomosynthesis, and breast CT images using power law metrics**, Lin Chen, John M. Boone, UC Davis Medical Ctr. (USA); Craig K. Abbey, Univ. of California, Santa Barbara (USA) . . . .[7961-14]

2:40 pm: **Imaging properties of the magnification factor in digital mammography by the generalized MTF (GMTF)**, Hye-Suk Park, Hee-Joung Kim, Hyo-Min Cho, Chang-Lae Lee, Dae-Hong Kim, Seung-Wan Lee, Yu-Na Choi, Yonsei Univ. (Korea, Republic of).[7961-15]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling

Room: Monterey 1-3

SESSION 3

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

Visualization and Modeling

Session Chairs: **Baowei Fei,** Emory Univ.; **George J. Grevera,** Saint Joseph's Univ.

1:20 pm: **Fuzzy object modeling**, Jayaram K. Udupa, Dewey Odhner, The Univ. of Pennsylvania Health System (USA); Alexandre X. Falcão, Univ. Estadual de Campinas (Brazil); Krzysztof C. Ciesielski, West Virginia Univ. (USA); Paulo A. V. Miranda, Univ. Estadual de Campinas (Brazil); Pavithra Vaideeshwaran, Shipra Mishra, Ayesha Shaheryar, Univ. of Pennsylvania (USA); George J. Grevera, Saint Joseph's Univ. (USA); Babak Saboury, Univ. of Pennsylvania (USA); Drew Torigian, Hospital of the Univ. of Pennsylvania (USA) . . .[7964-10]

1:40 pm: **The sparse data extrapolation problem: strategies for soft-tissue correction for image-guided liver surgery**, Michael I. Miga, Prashanth Dumpuri, Amber L. Simpson, Vanderbilt Univ. (USA) . . . .[7964-11]

2:00 pm: **3D density estimation in digital breast tomosynthesis - application to needle path planning for breast biopsy**, Laurence Vancamberg, Nausikaa Geeraert, Razvan Iordache, Giovanni J. Palma, Remy Klausz, Serge Muller, GE Healthcare France (France) . . . .[7964-12]

2:20 pm: **Fast Interactive Exploration of 4D MRI Flow Data**, Anja B. Z. Hennemuth, Ola Friman, Christian Schumann, Fraunhofer MEVIS (Germany); Jelena Bock, Univ. Hospital Freiburg (Germany); Johann Drexl, Markus Huellebrand, Fraunhofer MEVIS (Germany); Michael Markl, Univ. Hospital Freiburg (Germany); Heinz-Otto Peitgen, Fraunhofer MEVIS (Germany) . . . .[7964-13]

2:40 pm: **Intraoperative 3D stereo visualization for image-guided cardiac ablation**, Mahdi Azizian, Rajni Patel, The Univ. of Western Ontario (Canada) and Canadian Surgical Technologies and Advanced Robotics (CSTAR) (Canada) . . . .[7964-14]

Coffee Break .3:00 to 3:30 pm

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging

Room: Fiesta 8-10

SESSION 3

Room: Fiesta 8-10. . . . . Sun. 1:20 to 3:00 pm

Body Imaging: Image Based Analysis

Session Chair: **Anne Clough,** Marquette Univ.

1:20 pm: **Image-guided prostate sectioning supporting registration of graded cancerous foci from digital histopathology images to in vivo MRI: an interactive visualization tool**, Eli D. G. Gibson, Robarts Research Institute (Canada); Aaron Fenster, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada); Cathie Crukley, Robarts Research Institute (Canada); Charles McKenzie, The Univ. of Western Ontario (Canada) and Lawson Health Research Institute (Canada); Jose A. Gomez-Lemus, Madeleine Moussa, Glenn Bauman, The Univ. of Western Ontario (Canada); Aaron D. Ward, Robarts Research Institute (Canada) . . . .[7965-12]

1:40 pm: **Mouse whole-body organ mapping by non-rigid registration approach**, Di Xiao, Commonwealth Scientific and Industrial Research Organisation (Australia); David Zahra, Australian Nuclear Science and Technology Organisation (Australia); Pierrick T. Bourgeat, Commonwealth Scientific and Industrial Research Organisation (Australia); Paula Berghofer, Australian Nuclear Science and Technology Organisation (Australia); Oscar Acosta Tamayo, Univ. de Rennes 1 (France); Heather Green, Marie Gregoire, Australian Nuclear Science and Technology Organisation (Australia); Olivier Salvado, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . .[7965-13]

2:00 pm: **Affine invariant parameterization to assess local shape in abdominal organs**, Jeremy Watt, Marius George Linguraru, Ronald M. Summers M.D., National Institutes of Health (USA) . . . .[7965-14]

2:20 pm: **MRI-based quantification of duchenne muscular dystrophy in a canine model**, Jiahui Wang, Zheng Fan, Joe Kornegay, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA). . . . .[7965-15]

2:40 pm: **Toward understanding the complex mechanisms behind breast thermography: an overview for comprehensive numerical study**, Li Jiang, The George Washington Univ. (USA); Wang Zhan, Univ. of California, San Francisco (USA); Murray H. Loew, The George Washington Univ. (USA) . . .[7965-16]

Coffee Break .3:00 to 3:30 pm

Conference 7968 continued
Ultrasonic Imaging and Signal Processing

Room: Fiesta 1-3

SESSION 3

Room: Fiesta 1-3. . . . . Sun. 1:20 to 3:00 pm

Tissue Characterization and Modeling

Session Chair: **Marvin M. Doyley,** Univ. of Rochester

1:20 pm: **Support-vector-machine-based classification of multidimensionnal signals for fetal activity characterization**, Sophie Ribes, Denis Kouame, Institut de Recherche en Informatique de Toulouse (France); Iulian Voicu, Jean-Marc Girault, Univ. de Tours (France); Morgane Fournier-Massignan, CHRU Tours (France); Franck Perrotin, Univ. de Tours (France); François Tranquart, Bracco SA (Switzerland) . . .[7968-12]

1:40 pm: **An expectation maximization framework for an improved tissue characterization using ultrasounds**, Martino Alessandrini, Simona Maggio, Univ. degli Studi di Bologna (Italy); Jonathan Poree, CREATIS-LRMN INSA (France); Luca De Marchi, Nicolo Speciale, Univ. degli Studi di Bologna (Italy); Emilie Franceschini, Ctr. National de la Recherche Scientifique (France); Olivier Bernard, Olivier Basset, CREATIS-LRMN INSA (France) . . . .[7968-13]

2:00 pm: **Tissue classification using depth-dependent ultrasound time series analysis: In vitro animal study**, Farhad Imani, Queen's Univ. (Canada); Mohammad I. Daoud, Mehdi Moradi, Purang Abolmaesumi, The Univ. of British Columbia (Canada); Parvin Mousavi, Queen's Univ. (Canada). . . . .[7968-43]

2:20 pm: **Computer-aided tissue characterization using ultrasound-induced thermal effects: analytical formulation and in vitro animal study**, Mohammad I. Daoud, The Univ. of British Columbia (Canada); Parvin Mousavi, Farhad Imani, Queen's Univ. (Canada); Robert N. Rohling, Purang Abolmaesumi, The Univ. of British Columbia (Canada) . . . .[7968-15]

2:40 pm: **Three-dimensional computer simulation of high-frequency ultrasound imaging of healthy and cancerous murine liver tissues**, Mohammad I. Daoud, The Univ. of Western Ontario (Canada) and The Univ. of British Columbia (Canada); James C. Lacefield, The Univ. of Western Ontario (Canada) and Robarts Research Institute (Canada) . . . .[7968-16]

Coffee Break .3:00 to 3:30 pm

Sunday · 13 February

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

Conference 7968 continued
Ultrasonic Imaging and Signal Processing
Room: Fiesta 1-3

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

Iterative and Statistical Reconstruction
Session Chairs: **Jinyi Qi**, Univ. of California, Davis; **Guang-Hong Chen**, Univ. of Wisconsin-Madison

3:30 pm: **Predictive models for observer performance in CT: applications in protocol optimization**, Samuel Richard, Duke Univ. (USA); Girijesh Yadava, GE Healthcare (USA); Xiang Li, Ehsan Samei, Duke Univ. (USA) . . . .[7961-16]

3:50 pm: **High-order noise analysis for low dose iterative image reconstruction methods: ASIR, IRIS, and MBAI**, Synho Do, Sarabjeet Singh, Mannudeep K. Kalra, Massachusetts General Hospital (USA); William C. Karl, Boston Univ. (USA); Thomas J. Brady, Homer Pien, Massachusetts General Hospital (USA) . . . . . .[7961-17]

4:10 pm: **Adaptive iterative reconstruction (AIR)**, Herbert K. Bruder, Rainer Raupach, Martin Sedlmair, Johann Sunnegardh, Karl Stierstorfer, Thomas Flohr, Siemens Healthcare (Germany). . . . .[7961-18]

4:30 pm: **Fast iterative image reconstruction using sparse matrix factorization with GPU acceleration**, Jian Zhou, Jinyi Qi, Univ. of California, Davis (USA) . . . .[7961-19]

4:50 pm: **Precision of hepatic CT image quantifications: a comparative study of conventional (FBP) and iterative reconstruction algorithms (ASiR and MBIR)**, Baiyu Chen, Ehsan Samei, Huiman Barnhart, Daniele Marin, James G. Colsher, Rendon Nelson, Duke Univ. (USA) . . . .[7961-20]

5:10 pm: **An iterative dual energy CT reconstruction method for a K-edge contrast material**, Maarten Depypere, Johan Nuyts, Nick van Gastel, Geert Carmeliet, Frederik Maes, Paul Suetens, Katholieke Univ. Leuven (Belgium) . . . .[7961-21]

> **WORKSHOP**
> **Statistical Reconstruction in CT**
> Fiesta 5 Room · Sun. 5:45 to 7:45 pm
> **Norbert J. Pelc,** Stanford Univ. (USA)
> *For details see page 8.*

SESSION 4
Room: Monterey 1-3 . . . . . . Sun. 3:30 to 5:30 pm

Image Segmentation and Registration
Session Chairs: **Jayaram K. Udupa**, The Univ. of Pennsylvania Health System; **Alexandre X. Falcão**, Univ. Estadual de Campinas (Brazil)

3:30 pm: **A novel class of machine-learning-driven real-time 2D/3D tracking methods: texture model registration (TMR)**, Philipp Steininger, Markus Neuner, Paracelsus Medizinische Privatuniversität (Austria); Karl Fritscher, Univ. für Gesundheitswissenschaften, Medizinische Informatik und Technik (Austria); Felix Sedlmayer M.D., Heinrich Deutschmann, Paracelsus Medizinische Privatuniversität (Austria). . . . . .[7964-15]

3:50 pm: **Uncertainty propagation and analysis of image-guided surgery**, Amber L. Simpson, Vanderbilt Univ. (USA); Burton Ma, York Univ. (Canada); Randy E. Ellis, James Stewart, Queen's Univ. (Canada); Michael I. Miga, Vanderbilt Univ. (USA) . . . .[7964-16]

4:10 pm: **Image-based global registration system for bronchoscopy guidance**, William E. Higgins, Rahul Khare, The Pennsylvania State Univ. (USA) . . . .[7964-17]

4:30 pm: **High-accuracy 3D image-based registration of endoscopic video to C-arm cone-beam CT for image-guided skull-base surgery**, Daniel Mirota, Ali Uneri, Sebastian Schafer, Sajendra Nithiananthan, The Johns Hopkins Univ. (USA); Douglas D. Reh M.D., The Johns Hopkins Outpatient Ctr. (USA); Gary L. Gallia M.D., Russell H. Taylor, Gregory D. Hager, Jeffrey H. Siewerdsen, The Johns Hopkins Univ. (USA) . . . .[7964-18]

4:50 pm: **A novel hybrid model for deformable image registration for abdominal procedures**, Xishi Huang, Paul Babyn, Thomas Looi, Peter C. W. Kim, Hospital for Sick Children (Canada). . . . .[7964-19]

5:10 pm: **Learning distance function for regression-based 4D pulmonary trunk model reconstruction estimated from sparse MRI data,** Dime Vitanovski, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Alexey Tsymbal, Siemens AG (Germany); Razvan Ionasec, Bogdan Georgescu, S. Kevin Zhou, Siemens Corporate Research (USA); Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Dorin Comaniciu, Siemens Corporate Research (USA). . . . .[7964-20]

> **WORKSHOP**
> **Toolkits and Research Interfaces for Image-Guidance and Visualization**
> Monterey 1-3 Room · Sun. 5:45 to 7:45 pm
> *For details see page 8.*

SESSION 4
Room: Fiesta 8-10. . . . . Sun. 3:30 to 5:30 pm

Bone and Micro-CT
Session Chair: **Robert C. Molthen**, Medical College of Wisconsin

3:30 pm: **Micro-CT characterization of human trabecular bone in osteogenesis imperfecta**, John R. Jameson, Carolyne Albert, Marquette Univ. (USA) and Orthopaedic & Rehabilitation Engineering Ctr. (USA); Peter Smith, Shriners Hospitals for Children (USA) and Orthopaedic & Rehabilitation Engineering Ctr. (USA); Robert C. Molthen, Medical College of Wisconsin (USA) and U.S. Dept. of Veterans Affairs, Zablocki VA Medical Ctr. (USA) and Marquette Univ. (USA); Gerald F. Harris, Marquette Univ. (USA) and Orthopaedic & Rehabilitation Engineering Ctr. (USA) and Shriners Hospitals for Children (USA). . .[7965-17]

3:50 pm: **3D visualization and quantification of bone and teeth mineralization for the study of osteo/dentinogenesis in mice models**, Arnaud Marchadier, Univ. d'Orléans (France); Catherine Vidal, Sylvain Ordureau, Institut Pasteur (France); Roger Ledee, Christophe Leger, Univ. d'Orléans (France); Marian Young, National Institutes of Health (USA); Michel Goldberg, Institut Pasteur (France) . . . .[7965-18]

4:10 pm: **Structure based classification of micro-CT images of human trabecular bone using local Minkowski functionals**, Roberto A. Monetti, Max-Planck-Institut für extraterrestrische Physik (Germany); Jan S. Bauer, Technische Univ. München (Germany); Irina N. Sidorenko, Max-Planck-Institut für extraterrestrische Physik (Germany); Dirk Mueller, Ernst J. Rummeny, Technische Univ. München (Germany); Maiko Matsuura, Ludwig-Maximilians-Univ. München (Germany); Felix Eckstein, Paracelsus Medizinische Privatuniversität (Austria); Eva-Maria Lochmueller, Ludwig-Maximilians-Univ. München (Germany); Philippe K. Zysset, Technische Univ. Wien (Austria); Christoph W. Raeth, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . .[7965-19]

4:30 pm: **Detecting metastasis of gastric carcinoma using high-resolution micro-CT system: in vivo small animal study**, Junting Liu, Xidian Univ. (China); Jie Tian, Sr., Institute of Automation (China); Jimin Liang, Xiangsi Li, Xidian Univ. (China); Xiang Yang, Xiaofeng Chen, Guangzhou Zhongke Kaisheng Medical Technology Co., Ltd. (China); Yi Chen, Yuanfang Zhou, Shanghai Institute of Materia Medica (China); Xiaorui Wang, Xidian Univ. (China) . . . .[7965-20]

4:50 pm: **Time-course characterization of an aqueous colloidal polydisperse contrast agent in mice using micro-computed tomography**, Sarah A. Detombe, Joy Dunmore-Buyze, Maria Drangova, Robarts Research Institute (Canada) . . . .[7965-21]

5:10 pm: **Implementation and assessment of an animal management system for small-animal micro-CT / micro-SPECT imaging,** David W. Holdsworth, Sarah A. Detombe, Robarts Research Institute (Canada); Chris Chiodo, ASI Instruments, Inc. (USA); Stanley T. Fricke, Children's National Medical Ctr. (USA); Maria Drangova, Robarts Research Institute (Canada) . . . .[7965-22]

SESSION 4
\Room: Fiesta 1-3 . . . . Sun. 3:30 to 5:30 pm

Clinical Application of Novel Ultrasound Imaging Modalities
Session Chair: **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands)

3:30 pm: **Automatic detection and estimation of biparietal diameter from fetal ultrasonography**, Pavan Annangi, Kajoli B. Krishnan, Jyotirmoy Banerjee, GE Global Research (India); Madhumita Gupta, GE Healthcare (India); Uday Patil, GE Global Research (India). . . . .[7968-17]

3:50 pm: **A two dimensional locally regularized strain estimation technique: preliminary clinical results for the assessment of benign and malignant breast lesions**, Elisabeth F. Brusseau, Valérie Detti, CREATIS-LRMN INSA (France); Agnès Coulon, Emmanuèle Maissiat, Nawèle Boublay, Yves Berthezène, Hospices Civils de Lyon (France); Jérémie Fromageau, Nigel L. Bush, Jeffrey C. Bamber, The Institute of Cancer Research (UK) . . . .[7968-18]

4:10 pm: **Preliminary comparison between real-time in vivo spectral and transverse oscillation flow estimates**, Mads M. Pedersen, Rigshospitalet (Denmark); Michael Pihl, Jens M. Hansen, Technical Univ. of Denmark (Denmark); Per Haugaard, B-K Medical (Denmark); Kristoffer Lindskov Hansen, Michael Bachmann Nielsen, Rigshospitalet (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark)[7968-19]

4:30 pm: **2D/3D image fusion of x-ray mammograms with speed of sound images: evaluation and visualization**, Torsten Hopp, Julie Bonn, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany); Mark A. Sak, Nebojsa Duric, Karmanos Cancer Institute (USA) .[7968-20]

4:50 pm: **Breast imaging with ultrasound tomography: a comparative study with MR**, Bryan J. Ranger, Peter J. Littrup, Nebojsa Duric, Cuiping Li, Steven P. Schmidt, Olsi Rama, Lisa Bey-Knight R.N., Karmanos Cancer Institute (USA) . . . .[7968-21]

5:10 pm: **Relationship between breast sound speed and mammographic percent density**, Mark A. Sak, Nebojsa Duric, Karmanos Cancer Institute (USA); Norman F. Boyd, Princess Margaret Hospital (Canada); Lukasz Myc, Muhammad Faiz, Cuiping Li, Lisa Bey-Knight R.N., Karmanos Cancer Institute (USA) .[7968-22]

> **WORKSHOP**
> **Magnetic Particle Imaging**
> Fiesta 8-10 Room · Sun. 5:45 to 7:45 pm
> **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (USA); **Thorsten M. Buzug,** Univ. zu Lübeck (Germany)
> *For details see page 8.*

Conference 7962 Posters
Image Processing

Registration

Log-Euclidean free-form deformation, Marc Modat, Gerard R. Ridgway, Pankaj Daga, Manuel J. Cardoso, David J. Hawkes, John Ashburner, Sébastien Ourselin, Univ. College London (UK) . . . . [7962-61]

Correspondence estimation from non-rigid motion information, Jonas Wulff, RWTH Aachen (Germany); Thomas F. Lotz, Univ. of Canterbury (New Zealand); Thomas Stehle, Til Aach, RWTH Aachen (Germany); J. Geoffrey Chase, Univ. of Canterbury (New Zealand). . . . . [7962-62]

Co-registration of high resolution MRI sub-volumes in non-human primates, Jérémy Lecoeur, Vanderbilt Univ. (USA); Feng Wang, Li Min Chen, Vanderbilt Univ. Institute of Imaging Science (USA); Rui Li, Malcom J. Avison, Vanderbilt Univ. Medical Ctr. (USA); Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . [7962-63]

Motion analysis for duplicate frame removal in wireless capsule endoscope, Hyun Gyu Lee, Min Kook Choi, Sang-Chul Lee, Inha Univ. (Korea, Republic of) . . . . [7962-64]

Fully automated prone-supine coregistration in computed tomographic colonography, Brynmor J. Davis, James A. Norris, Jerry Bieszczad, Creare Inc. (USA); Jorge A. Soto, Boston Univ. (USA); David B. Kynor, Creare Inc. (USA) . . . . [7962-65]

Local rigid registration for multimodal texture feature extraction from medical images, Sebastian Steger, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . . . . [7962-66]

Registration of multi-view apical 3D echocardiography images, Harriët W. Mulder, Marijn van Stralen, Univ. Medical Ctr. Utrecht (Netherlands); Heleen B. van der Zwaan M.D., Esther Leung, Johan G. Bosch, Erasmus MC (Netherlands); Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) . . . . [7962-67]

Robust linear registration of CT images using random regression forests, Ender Konukoglu, Antonio Criminisi, Microsoft Research Cambridge (UK); Sayan D. Pathak, Microsoft Corp. (USA); D. Robertson, Microsoft Research Cambridge (UK); Steve White, Khan M. Siddiqui M.D., Microsoft Corp. (USA) . . . . [7962-68]

Ridge-based retinal image registration algorithm involving OCT fundus images, Ying Li, Giovanni Gregori, Robert W. Knighton, Bascom Palmer Eye Institute (USA); Brandon J. Lujan, Univ. of California, Berkeley (USA); Philip J. Rosenfeld, Byron L. Lam, Bascom Palmer Eye Institute (USA) . . . . [7962-69]

2D to 3D ultrasound registration for robotically assisted laparoscopic radical prostatectomy, Mehdi Esteghamatian, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Stephen E. Pautler, The Univ. of Western Ontario (Canada); Charles McKenzie, Terry M. Peters, Robarts Research Institute (Canada) . . . . [7962-70]

Multimodal image registration by edge attraction and regularization using a B-spline grid, Almar Klein, Dirk-Jan Kroon, Univ. Twente (Netherlands); Yvonne Hoogeveen, Leo J. Schultze Kool, Willem K. Renema, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Cornelis H. Slump, Univ. Twente (Netherlands) . . . . [7962-71]

Nonrigid registration of multiphoton microscopy images using B-splines, Kevin S. Lorenz, Purdue Univ. (USA); Paul Salama, Indiana Univ.-Purdue Univ. Indianapolis (USA); Kenneth W. Dunn, Indiana Univ. (USA); Edward J. Delp III, Purdue Univ. (USA) . . . . [7962-72]

Efficient registration method of medical images using GPU, Tsuneya Kurihara, Kazuki Matsuzaki, Kumiko Seto, Yoshihiko Nagamine, Hitachi, Ltd. (Japan) . . [7962-73]

Evaluation of optimization methods for intensity-based 2D-3D registration in x-ray guided interventions, Martijn van der Bom, Univ. Medical Ctr. Utrecht (Netherlands); Stefan Klein, Erasmus MC (Netherlands); Marius Staring, Leids Univ. Medisch Ctr. (Netherlands); Robert Homan, Philips Healthcare (Netherlands); Wilbert Bartels, Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) . . . . [7962-74]

Atlases

Evaluation of multi atlas-based approaches for the segmentation of the thyroid gland in IMRT head-and-neck CT images, Antong Chen, Kenneth J. Niermann, Matthew A. Deeley, Benoit M. Dawant, Vanderbilt Univ. (USA). . . [7962-75]

Automatic skull-stripping of rat MRI/DTI scans and atlas building, Ipek Oguz, Joohwi Lee, The Univ. of North Carolina at Chapel Hill (USA); Francois Budin, Ashley Rumple, Matthew McMurray, The Univ. of North Carolina at Chapel Hill School of Medicine (USA); Cindy Ehlers, The Scripps Research Institute (USA); G. Allan Johnson, Duke Univ. Medical Ctr. (USA); Fulton Crews, The Univ. of North Carolina at Chapel Hill (USA); Josephine Johns, Martin A. Styner, The Univ. of North Carolina at Chapel Hill School of Medicine (USA) . . . . [7962-76]

Evaluating and improving atlas-based segmentation using spatial distance maps, Thomas R. Langerak, Uulke A. van der Heide, Alexis N. Kotte, Floris F. Berendsen, Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) [7962-77]

Group-wise automatic mesh-based analysis of cortical thickness, Clement Vachet, Heather Cody Hazlett, Marc Niethammer, Ipek Oguz, The Univ. of North Carolina at Chapel Hill (USA); Joshua Cates, Ross Whitaker, The Univ. of Utah (USA); Joseph Piven, The Univ. of North Carolina at Chapel Hill (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill School of Medicine (USA) . . . . [7962-78]

A totally deflated lung's CT image construction by means of extrapolated deformable registration, Ali Sadeghi Naini, Rajni Patel, Abbas Samani, The Univ. of Western Ontario (Canada) . . . . [7962-79]

An automated pipeline for cortical surface generation and registration of the cerebral cortex, Wen Li, Univ. of Iowa (USA); Luis Ibanez, Kitware, Inc. (USA); Arnaud J. F. Gelas, Harvard Medical School (USA); B. T. Thomas Yeo, Harvard Univ. (USA); Marc Niethammer, The Univ. of North Carolina at Chapel Hill (USA); Vincent A. Magnotta, Nancy C. Andreasen, The Univ. of Iowa Hospitals and Clinics (USA) . . . . [7962-80]

Groupwise consistent image registration: a crucial step for the construction of a standardized near infrared hyperspectral teeth database, Ziga Spiclin, Peter Usenik, Miran Bürmen, Ales Fidler, Franjo Pernuš, Boštjan Likar, Univ. of Ljubljana (Slovenia) . . . . [7962-81]

Segmentation

Model-based segmentation of the facial nerve and chorda tympani in pediatric CT, Fitsum A. Reda, Jack H. Noble, Alejandro Rivas, Robert F. Labadie, Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . [7962-82]

Estimation of sufficient signal to noise ratio for texture analysis of magnetic resonance images, Sami J. Savio, Tampere Univ. Hospital (Finland); Lara Harrison, Tampere Univ. Hospital (Finland) and Tampere Univ. of Technology (Finland); Pertti Ryymin, Prasun Dastidar, Seppo Soimakallio, Tampere Univ. Hospital (Finland); Hannu J. Eskola, Tampere Univ. Hospital (Finland) and Tampere Univ. of Technology (Finland) . . . . [7962-83]

Variational level-set segmentation and tracking of left ventricle using field prior, Mariam Afshin, The Univ. of Western Ontario (Canada); Ismail Ben Ayed, GE Healthcare (Canada); Ali Islam, St. Joseph's Health Care London (Canada); Ian D. Ross, London Health Sciences Ctr. (Canada); Terry M. Peters, Robarts Research Institute (Canada); Shuo Li, GE Healthcare (Canada) . [7962-84]

Novel segmentation method to identify left ventricular infarction in short-axis composite strain-encoded magnetic resonance images, Ahmad O. Algohary, Cairo Univ. (Egypt); Muhammad K. Metwally, Nile Univ. (Egypt); Ahmed M. El-Bialy, Ahmed H. Kandil, Cairo Univ. (Egypt); Nael F. Osman, Nile Univ. (Egypt) and The Johns Hopkins Univ. (USA) . . . . [7962-85]

Automated analysis of infarct heterogeneity on delayed enhancement magnetic resonance images, YingLi Lu, Gideon A. Paul, Kim A. Connelly, Graham A. Wright, Perry E. Radau, Sunnybrook Health Sciences Ctr. (Canada) . . . . [7962-86]

White matter lesion segmentation using machine learning and weakly labeled MR images, Yuchen Xie, Xiaodong Tao, GE Global Research (USA) . . . . [7962-87]

Fast 4D segmentation of large datasets using graph cuts, Herve J. Lombaert, Ecole Polytechnique de Montréal (Canada); Yiyong Sun, Siemens Corporate Research (USA); Farida Cheriet, Ecole Polytechnique de Montréal (Canada). . . . . [7962-88]

Segmentation of liver and liver tumor for the Liver-Workbench, Jiayin Zhou, A*STAR Institute for Infocomm Research (Singapore); Feng Ding, National Univ. of Singapore (Singapore); Wei Xiong, Weimin Huang, Qi Tian, Zhimin Wang, A*STAR Institute for Infocomm Research (Singapore); Sudhakar K. Venkatesh, National Univ. Hospital (Singapore); Wee Kheng Leow, National Univ. of Singapore (Singapore) . . . [7962-89]

Automatic detection, segmentation and characterization of retinal horizontal neurons in large-scale 3D confocal imagery, Mahmut Karakaya, The Univ. of Tennessee (USA); Ryan A. Kerekes, Shaun S. Gleason, Oak Ridge National Lab. (USA); Rodrigo A. P. Martins, Univ. Federal do Rio de Janeiro (Brazil); Michael Dyer, St. Jude Children's Research Hospital (USA) . . . . [7962-90]

3D segmentation of prostate ultrasound images using wavelet transform, Hamed Akbari, Xiaofeng Yang, Luma Halig, Baowei Fei, Emory Univ. (USA) . . . . [7962-91]

Orientation estimation of anatomical structures in medical images for object recognition, Ulas Bagci, The Univ. of Nottingham (UK); Jayaram K. Udupa, The Univ. of Pennsylvania Health System (USA); Xinjian Chen, National Institutes of Health (USA) . . . . [7962-92]

Automated detection of cone photoreceptors in high-resolution volume images of the retina, Sangyeol Lee, Omer P. Kocaoglu, Ashley E. Herde, Qiang Wang, Weihua Gao, Ravi S. Jonnal, Donald T. Miller, Indiana Univ. (USA). . . . . . . [7962-93]

Local morphologic scale: application to segmenting tumor infiltrating lymphocytes in ovarian cancer TMAs, Andrew Janowczyk, Indian Institute of Technology, Bombay (India) and Rutgers, The State Univ. of New Jersey (USA); Sharat Chandran, Indian Institute of Technology, Bombay (India); Michael D. Feldman, The Univ. of Pennsylvania Health System (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . . [7962-94]

Brain tumour segmentation and tumour tissue classification based on multiple MR protocols, Astrid Franz, Stefanie Remmele, Jochen Keupp, Philips Research (Germany) . . . . [7962-95]

Ensemble framework for GBM brain tumor segmentation, Jing Huo, Eva M. van Rikxoort, Univ. of California, Los Angeles (USA); Kazunori Okada, San Francisco State Univ. (USA); Hyun Grace Kim, Whitney B. Pope, Jonathan G. Goldin, Matthew S. Brown, Univ. of California, Los Angeles (USA) . . . . [7962-96]

Feature-driven model-based segmentation, Arish A. Qazi, Princess Margaret Hospital (Canada); John Kim, David A. Jaffray, Princess Margaret Hospital (Canada) and Univ. of Toronto (Canada); Vladimir Pekar, Philips Research North America (Canada) . . . . [7962-97]

Cell segmentation and splitting for histopathological image analysis, Hui Kong, The Ohio State Univ. (USA); Kamel Belkacem-Boussaid, Metin N. Gurcan, The Ohio State Univ. Medical Ctr. (USA) . . . . [7962-98]

Automatic ROI identification for fast liver tumor segmentation using graph-cuts, Klaus Drechsler, Michael Strosche, Cristina Oyarzun Laura, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . . . . [7962-99]

Simultaneous automatic detection of optic disc and fovea on fundus photographs, Xiayu Xu, The Univ. of Iowa (USA); Michael D. Abramoff, The Univ. of Iowa Hospitals and Clinics (USA); Joseph M. Reinhardt, Mona K. Garvin, The Univ. of Iowa (USA). . . . . [7962-100]

Supervised segmentation methods for the hippocampus in MR images, Marijn van Stralen, Mirjam I. Geerlings, Koen L. Vincken, Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands) . . . . . . [7962-101]

Integrating an adaptive region based appearance model with a landmark free statistical shape model: application to prostate MRI segmentation, Robert J. Toth, Rutgers, The State Univ. of New Jersey (USA); Julie Bulman, Amish Patel, Beth Israel Deaconess Medical Ctr. (USA); B. Nicholas Bloch, Boston Medical Ctr. (USA); Elizabeth M. Genega, Neil M. Rofsky, Robert E. Lenkinski, Beth Israel Deaconess Medical Ctr. (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . . [7962-102]

Segmenting multiple overlapping objects via an integrated region and boundary based active contour incorporating shape priors: applications to histopathology, Ali N. Sahirzeeshan, Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . . [7962-103]

Automatic three-dimensional rib centerline extraction from CT scans for enhanced visualization and anatomical context, Sowmya Ramakrishnan, Christopher V. Alvino, Leo Grady, Atilla P. Kiraly, Siemens Corporate Research (USA) . . . . [7962-104]

Segmentation of in vivo target prior to tracking, Norbert Masson, Ecole Nationale Supérieure de Physique de Strasbourg (France); Philippe Zanne, Ecole Nationale Supérieure de Physique de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France); Florent P. Nageotte, Ecole Nationale Supérieure de Physique de Strasbourg (France); Michel de Mathelin, Ecole Nationale Supérieure de Physique de Strasbourg (France) and Ctr. National de la Recherche Scientifique (France) . [7962-105]

Stability based validation of cellular segmentation algorithms, Peter O. Ajemba, Richard Scott, Michael J. Donovan, Gerardo Fernandez, Aureon Biosciences, Inc. (USA). . . . . [7962-106]

Neural stem cell segmentation in phase contrast movies, Stephane U. Rigaud, IPAL International Mixed Research Unit UMI CNRS 2955 (Singapore) and Univ. of Pierre and Marie Curie (France); Nicolas Lomenie, IPAL International Mixed research Unit UMI CNRS 2955 (Singapore) and Ctr. National de la Recherche Scientifique (France) and Univ. Paris Descartes (France) . . . . . . [7962-107]

Boundary detection by linear programming with application to lung fields segmentation, Bulat Ibragimov, Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia) . . . . [7962-108]

A liver segmentation approach in contrast-enhanced CT images with patient specific knowledge, Ahmed Afifi, Toshiya Nakaguchi, Norimichi Tsumura, Chiba Univ. (Japan) . . . . [7962-109]

Multiple weak segmentors for strong mass segmentation in mammogram, Yu Zhang, Noriko Tomuro, Jacob D. Furst, Daniela S. Raicu, DePaul Univ. (USA) . . . . [7962-110]

A framework for automated coronary artery tracking of low axial resolution multislice CT images, Jing Wu, Emma Lewis, Univ. of Surrey (UK); Gordon Ferns M.D., Keele Univ. (UK); John W. Giles M.D., Conquest Hospital (UK) . . . . [7962-111]

3D segmentation of medical volume image using hybrid level set method, Myung-Eun Lee, Wan-Hyun Cho, Sun-Worl Kim, Soo-Hyung Kim, Chonnam National Univ. (Korea, Republic of) . . . . . . [7962-112]

Brain MRI segmentation and lesion detection using generalized Gaussian and Rician modeling, Xuqiang Wu, Univ. of Houston (USA); Stephanie Bricq, Christophe Collet, LSIIT, Univ. de Strasbourg (France) . . . . [7962-113]

Robust method for extracting the pulmonary vascular trees from 3D MDCT images, William E. Higgins, Pinyo Taeprasartsit, The Pennsylvania State Univ. (USA) . . . . [7962-114]

A computerized scheme for localization of vertebral bodies on body CT scans, Tatsuro Hayashi, Huayue Chen, Kei Miyamoto, Xiangrong Zhou, Takeshi Hara, Ryujiro Yokoyama, Masayuki Kanematsu, Hiroaki Hoshi, Hiroshi Fujita, Gifu Univ. School of Medicine (Japan). . . . . [7962-115]

Unsupervised segmentation of ultrasound images by fusion of spatio-frequential textural features, Said Benameur, Frederic Lavoie M.D., Eiffel Medtech, Inc. (Canada); Max Mignotte, Univ. de Montréal (Canada) . . . . [7962-116]

Applying nonlinear band expansion and nonnegative matrix underapproximation for unsupervised segmentation of liver from multiphase CT image, Ivica Kopriva, Institut Ruder Boškovic (Croatia); Xinjian Chen, Jianhua Yao, National Institutes of Health (USA) . . . . [7962-117]

Automatic segmentation of chromatographic images for region of interest delineation, Ana M. Mendonça, Univ. do Porto (Portugal) and Instituto de Engenharia Biomédica (Portugal); António V. Sousa, Univ. do Porto (Portugal) and Instituto Superior de Engenharia do Porto (Portugal); M. Clara Sá-Miranda, Univ. do Porto (Portugal); Aurélio C. Campilho, Instituto de Engenharia Biomédica (Portugal) and Univ. do Porto (Portugal) . . . [7962-118]

A nonparametric segmentation method based on structural information using level sets, Yingxuan Zhu, Syracuse Univ. (USA); Samuel Cheng, The Univ. of Oklahoma - Tulsa (USA); Amrit L. Goel, Syracuse Univ. (USA) . . . . [7962-119]

Simultaneous image segmentation and medial structure estimation: application to 2D and 3D vessel tree extraction, Sherif Makram Ebeid, Philips France (France); Guillaume Pizaine, Philips Healthcare (France) and Telecom ParisTech (France) . . . . [7962-120]

A unified framework for concurrent detection of anatomical landmarks for medical image understanding, Mitsutaka Nemoto, Yoshitaka Masutani, The Univ. of Tokyo (Japan); Shouhei Hanaoka, The Univ. of Tokyo (Japan) and Univ. für Gesundheitswissenschaften, Medizinische Informatik und Technik (Austria); Yukihiro Nomura, Takeharu Nishikawa, Naoto Hayashi, Naoki Yoshioka, Kuni Ohtomo M.D., The Univ. of Tokyo (Japan) [7962-121]

Automatic classification for mammogram backgrounds based on bi-rads complexity definition and on a multi content analysis framework, Jie Wu, Univ. de Technologie Compiègne (France); Quentin J. A. Besnehard, Cédric Marchessoux, Barco N.V. (Belgium) . . . . [7962-122]

Foibles, follies, and fusion: assessment of statistical label fusion techniques for web-based collaborations using minimal training, Andrew J. Asman, Andrew G. Scoggins, Vanderbilt Univ. (USA); Jerry L. Prince, The Johns Hopkins Univ. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) and The Johns Hopkins Univ. (USA) . . . . [7962-123]

Automatic tissue classification for high-resolution breast CT images based on bilateral filtering, Xiaofeng Yang, Ioannis Sechopoulos, Baowei Fei, Emory Univ. (USA) . . . . [7962-124]

Automated cell analysis tool for a genome-wide RNAi screen with support vector machine based supervised learning, Steffen Remmele, Julia Ritzerfeld, Walter Nickel, Jürgen Hesser, Ruprecht-Karls-Univ. Heidelberg (Germany) [7962-125]

Automatic detection of region of interests in mammographic images, Erkang Cheng, Haibin Ling, Temple Univ. (USA); Predrag R. Bakic, Andrew D. Maidment, The Univ. of Pennsylvania Health System (USA); Vasileios Megalooikonomou, Temple Univ. (USA) . . . . [7962-126]

Plexiform neurofibroma tissue classification, Lior Weizman, Lior Hoch, The Hebrew Univ. of Jerusalem (Israel); Liat Ben Sira M.D., Tel Aviv Sourasky Medical Ctr. (Israel); Leo Joskowicz, The Hebrew Univ. of Jerusalem (Israel); Li-tal Pratt M.D., Shlomi Constantini, Dafna Ben Bashat, Tel Aviv Sourasky Medical Ctr. (Israel) . . . . [7962-127]

A novel classification method based on histogram equalization and membership function, Yaxin Peng, Shanghai Univ. (China); Chaomin Shen, Guixu Zhang, Lijia Wang, East China Normal Univ. (China) . . . . [7962-128]

Automatic 3D kidney segmentation based on shape constrained GC-OAAM, Xinjian Chen, Ronald M. Summers M.D., Jianhua Yao, National Institutes of Health (USA) . . . . [7962-129]

A new steerable pressure force for parametric deformable models, Jun Kong, Lee Cooper, Ashish Sharma, Tahsin Kurc, Daniel J. Brat, Joel H. Saltz M.D., Emory Univ. (USA) . . . . [7962-130]

Toward a parts-based approach to sub-cortical brain structure parsing, Digvijay Gagneja, Indian Institute of Technology, Kharagpur (India) and Univ. at Buffalo (USA); Caiming Xiong, Jason J. Corso, Univ. at Buffalo (USA) . . . . [7962-131]

Region based level set segmentation of the outer wall of the carotid bifurcation in CTA, Danijela V. Vukadinovic, Theo van Walsum, Rashindra Manniesing, Sietske Rozie, Aad van der Lugt, Wiro J. Niessen, Erasmus MC (Netherlands) . . . . . [7962-132]

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Phantom validation for ultrasound to statistical shape model registration of human pelvis, Sahar Ghanavati, Parvin Mousavi, Gabor Fichtinger, Queen's Univ. (Canada); Purang Abolmaesumi, Univ. of British Columbia (Canada). . . . . . [7964-103]

3D non-rigid registration using surface and local salient features for transrectal ultrasound image-guided prostate biopsy, Xiaofeng Yang, Hamed Akbari, Luma Halig, Baowei Fei, Emory Univ. (USA) . . [7964-104]

GPU accelerated registration of a statistical shape model of the lumbar spine to 3D ultrasound images, Siavash Khallaghi, Queen's Univ. (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada); Ren-Hui Gong, Elvis C. S. Chen, Sean Gill, Queen's Univ. (Canada); Jonathan Boisvert, National Research Council Canada (Canada); David Pichora, Queen's Univ. (Canada); Dan Borschneck, Kingston General Hospital (Canada); Gabor Fichtinger, Parvin Mousavi, Queen's Univ. (Canada) . . . . [7964-105]

Anatomically-correct deformable colon phantom, James A. Norris, Michael D. Barton, Brynmor J. Davis, Jerry Bieszczad, Norm L. Meunier, Nathan W. Brown, David B. Kynor, Creare Inc. (USA). . . . . [7964-106]

Elastic image registration via rigid object motion induced deformation, Xiaofen Zheng, Jayaram K. Udupa, The Univ. of Pennsylvania Health System (USA); Bruce E. Hirsch, Drexel Univ. College of Medicine (USA) . . . . [7964-107]

Correspondenceless 3D-2D registration based on expectation conditional maximization, Xin Kang, Russell H. Taylor, Armand Mehran, Yoshito Otake, The Johns Hopkins Univ. (USA); Wai-Pan Yau, P.Y.S. Cheung, Yong Hu, The Univ. of Hong Kong (Hong Kong, China) . . . . [7964-108]

Segmentation

OpenCL based machine learning labeling of biomedical datasets, Anna Puig, Sergio Escalera, Oscar Amoros, Univ. de Barcelona (Spain) . . . . [7964-109]

Advanced level set segmentation of the right atrium in MR, Siqi Chen, Rensselaer Polytechnic Institute (USA) and Siemens Corporate Research (USA); Timo Kohlberger, Klaus J. Kirchberg, Siemens Corporate Research (USA) . . . . . [7964-110]

Automatic 3D segmentation of ultrasound images using atlas registration and statistical texture prior, Xiaofeng Yang, David Schuster, Viraj Master, Peter Nieh, Emory Univ. (USA); Aaron Fenster, Robarts Research Institute (Canada); Baowei Fei, Emory Univ. (USA). . . . . [7964-111]

Visualization

Quantitative wound healing measurement and monitoring system based on an innovative 3D imaging system, Steven Yi, James Wen, Gongjie Yin, Arthur B. Yang, Technest Holdings, Inc. (USA). . . [7964-112]

A GPU based adaptive clutter filter implementation for ultrasonic color flow imaging, Mingchang Zhao, CHISON Medical Imaging Co., Ltd. (China) and Fudan Univ. (China) and Institute of Automation (China); Shanjue Mo, CHISON Medical Imaging Co., Ltd. (China). . . . . . . [7964-113]

Between developable surfaces and circular con splines: curved slices of 3D volumes, Marco Paluszny, Univ. Nacional de Colombia Sede Medellín (Colombia) . . . . [7964-114]

A unified framework for voxel classification and triangulation, John S. H. Baxter, Terry M. Peters, Elvis C. S. Chen, Robarts Research Institute (Canada) . . . . [7964-115]

An interactive ROI tool for DTI fiber tracking, Florian Weiler, Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . [7964-116]

SimITK: rapid ITK prototyping using the Simulink visual programming environment, Andrew W. L. Dickinson, Parvin Mousavi, Queen's Univ. (Canada); David G. Gobbi, Atamai, Inc. (Canada); Purang Abolmaesumi, The Univ. of British Columbia (Canada) and Queen's Univ. (Canada) . . . . [7964-117]

Multidimensional transfer functions for effective visualization of streaming ultrasound and elasticity images, David Mann, Jesus J. Caban, National Institutes of Health (USA); Philipp J. Stolka, Emad Boctor, The Johns Hopkins Outpatient Ctr. (USA); Terry S. Yoo, National Library of Medicine (USA) . . . . [7964-118]

Efficient 3D rendering for Web-based medical imaging software: a proof of concept, Diego Cantor-Rivera, Robert Bartha, Terry M. Peters, Robarts Research Institute (Canada) . . . . [7964-119]

Efficient ray casting with LF-Minmax map in CUDA, Jae Choi, Catholic Univ. of America (USA) . . . . [7964-120]

An interactive exploded view generation using block-based re-rendering method, Dongsoon Kang, Byeong-Seok Shin, Inha Univ. (Korea, Republic of) . . . . . . [7964-121]

Texture-based segmentation and analysis of emphysema depicted on CT images, Jun Tan, Xingwei Wang, Dror Lederman, Jiantao Pu, Frank C. Sciurba, David Gur, Joseph K. Leader, Univ. of Pittsburgh Medical Ctr. (USA) . . . . [7965-59]

Three-dimensional automatic computer aided evaluation of pleural effusions using chest CT images, Mark Bi, Ronald M. Summers M.D., Jianhua Yao, National Institutes of Health (USA) . . . . [7965-67]

Quantitative computed tomography of lung parenchyma in patients with emphysema: analysis of higher-density lung regions, Dror Lederman, Joseph K. Leader, Bin Zheng, Univ. of Pittsburgh (USA); Frank C. Sciurba, Univ. of Pittsburgh Medical Ctr. (USA); Jun Tan, David Gur, Univ. of Pittsburgh (USA). . . . . . [7965-68]

Ventilation-perfusion study without contrast media in dynamic chest radiography, Rie Tanaka, Shigeru Sanada, Masaki Fujimura, Masahide Yasui, Kanazawa Univ. (Japan); Norio Hayashi, Kanazawa Univ. Hospital (Japan); Hiroyuki Okamoto, Kanazawa Univ. (Japan); Shiro Tsuji, Public Central Hospital of Matto Ishikawa (Japan); Nanbu Yuko, Osamu Matsui, Kanazawa Univ. Hospital (Japan) . . . . [7965-69]

Fully automated adipose tissue measurement on abdominal CT, Jianhua Yao, Daniel L. Sussman, Ronald M. Summers M.D., National Institutes of Health (USA) . . . . [7965-70]

Cardiac motion tracking approach with multilevel B-splines and SinMod from tagged MRI, Hui Wang, Amir A. Amini, Univ. of Louisville (USA) . . . . [7965-71]

Lung registration using airway tree morphometry, Jun Tan, Jiantao Pu, Univ. of Pittsburgh Medical Ctr. (USA); Sally E. Wenzel, Univ. of Pittsburgh (USA); Joseph K. Leader, Univ. of Pittsburgh Medical Ctr. (USA)[7965-72]

Vascular landmark detection in 3D CT data, David Liu, S. Kevin Zhou, Dominik Bernhardt, Dorin Comaniciu, Siemens Corporate Research (USA) . . . . . . [7965-73]

Automated segmentation of intraretinal layers from spectral-domain macular OCT: reproducibility of layer thickness measurement, Kyungmoo Lee, The Univ. of Iowa (USA); Michael D. Abramoff, The Univ. of Iowa Hospitals and Clinics (USA); Milan Sonka, Mona K. Garvin, The Univ. of Iowa (USA) . . . . [7965-74]

A fast dynamic linked library based mixed-language programming technology for the trust region method in bioluminescence tomography, Jie Tian, Sr., Institute of Automation (China) and Northeastern Univ. (China); Bo Zhang, Northeastern Univ. (China); Xin Yang, Chenghu Qin, Dong Han, Xibo Ma, Institute of Automation (China) . . . . [7965-75]

Bone texture analysis on dental radiographic images: results with several angulated radiographs on the same region of interest, Yves Amouriq, Aurore Arlicot, Nicolas Normand, Pierre Weiss, Jean-Pierre V. Guédon, Pierre Evenou, Univ. de Nantes (France) . . . . [7965-76]

Evaluation of image quality characteristics of reduction image in high resolution liquid crystal display, Yukiyoshi Kimura, Nagoya Univ. School of Medicine (Japan); Daigo Yokoyama, Nagoya Univ. (Japan); Naotoshi Fujita, Nagoya Univ. Hospital (Japan); Yoshie Kodera, Nagoya Univ. School of Medicine (Japan) . [7965-78]

White matter alterations in temporal lobe epilepsy, Paula Rejane B. Diniz, Carlos Ernesto G. Salmon, Tonicarlo R. Velasco, João P. Leite, Americo C. Santos, Antonio C. Sakamoto, Univ. de São Paulo (Brazil) . . . . [7965-79]

fMRI analysis software tools: an evaluation framework, Valentina Pedoia, Univ. degli Studi dell'Insubria (Italy); Vittoria Colli, Sabina Strocchi, Cristina Vite, Ospedale di Circolo e Fondazione Macchi Varese (Italy); Elisabetta Binaghi, Leopoldo Conte, Univ. degli Studi dell'Insubria (Italy) . . . . [7965-80]

Prediction of fMRI time series of a single voxel using radial basis function neural network, Sutao Song, Jiacai Zhang, Li Yao, Beijing Normal Univ. (China) . . . . . [7965-81]

The impact of respiratory and cardiac effects on the phase and magnitude of resting-state fMRI data, Zikuan Chen, Qing He, Vince D. Calhoun, The Mind Research Network (USA). . . . . [7965-82]

A mean-sensitive spatial filtering (MSF) method for trial-by-trial analysis of N170 component, Changming Wang, Jiacai Zhang, Li Yao, Beijing Normal Univ. (China); Xiaoping P. Hu, Emory Univ. (USA) and Georgia Institute of Technology (USA) . . . . [7965-83]

Comparison of DSC - MRI perfusion quantification methods in the presence of delay and dispersion, Bianca Maan, Rita L. Simoes, Univ. Twente (Netherlands); Anton Meijer, Willem K. Renema, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Cornelis H. Slump, Univ. Twente (Netherlands) . . . . [7965-84]

Cine phase-contrast MRI measurement of CSF flow in the cervical spine: a pilot study in patients with spinal cord injury, Mohammadjavad Negahdar, Mostafa Shakeri, Elizabeth McDowell, John Wells, Susan Harkema, Amir A. Amini, Univ. of Louisville (USA) . . . . [7965-85]

Comparison of gray matter volume and thickness for analysis of cortical changes in Alzheimer's Disease, Jia-Chao Liu, Ziyi Li, Beijing Normal Univ. (China); Kewei Chen, Banner Alzheimer's Institute (China); Li Yao, Beijing Normal Univ. (China); ZhiQun Wang, KunChen Li, Xuanwu Hospital (China); Xiaojuan Guo, Beijing Normal Univ. (China) . . . . [7965-86]

Altered cortical anatomical networks in temporal lobe epilepsy, Bin Lv, Huiguang He, Institute of Automation (China); Jingjing Lu, Peking Union Medical College Hospital (China); Dai Dai, Wenjing Li, Meng Li, Institute of Automation (China); Zhengyu Jin, Peking Union Medical College Hospital (China) . . . . [7965-87]

Abnormalities of hippocampal-cortical connectivity in the unilateral temporal lobe epilepsy (TLE) patients with hippocampal sclerosis, Wenjing Li, Huiguang He, Institute of Automation (China); Jingjing Lu, Peking Union Medical College Hospital (China); Meng Li, Bin Lv, Institute of Automation (China); Zhengyu Jin, Peking Union Medical College Hospital (China). . . . . [7965-88]

Transmit filter design methods for magnetic particle imaging, Bo Zheng, Patrick Goodwill, Steven Conolly, Univ. of California, Berkeley (USA) . . . . . . [7965-89]

The impact of filtering direct-feedthrough on the x-space theory of magnetic particle imaging, Kuan Lu, Patrick Goodwill, Bo Zheng, Steven Conolly, Univ. of California, Berkeley (USA) . . . . . [7965-90]

Sensitivity improvement of the molecular imaging technique based on magnetic nanoparticles, Yasutoshi Ishihara, Meiji Univ. (Japan); Tsuyoshi Kuwabara, Naoki Wadamori, Nagaoka Univ. of Technology (Japan) . . . . [7965-91]

X-space MPI relaxometry: methods and initial data, Arbi Tamrazian, Patrick Goodwill, Rohit Pidaparth, Univ. of California, Berkeley (USA); R. Matthew Ferguson, Kannan M. Krishnan, Univ. of Washington (USA); Steven Conolly, Univ. of California, Berkeley (USA) . . . . [7965-92]

The x-space formulation of magnetic particle imaging including non-negligible relaxation effects, Laura R. Croft, Patrick Goodwill, Arbi Tamrazian, Steven Conolly, Univ. of California, Berkeley (USA) [7965-93]

Measuring soft tissue elasticity by monitoring surface acoustic waves using image plane digital holography, Shiguang Li, Amy L. Oldenburg, The Univ. of North Carolina at Chapel Hill (USA). . . . . [7965-94]

Imaging Ca^{2+} mechanotrandsuction through a novel engineered polymer microenvironments for probing using dorsal cell adhesion, Warren C. Ruder, Philip R. LeDuc, Carnegie Mellon Univ. (USA) [7965-95]

Skeletonization approach for characterization of benign vs. malignant single thyroid nodules using 3-D contrast enhanced ultrasound, Filippo Molinari, Alice Mantovani, Politecnico di Torino (Italy); Maurilio Deandrea, Paolo Limone, Ordine Mauriziano di Torino (Italy); Roberto Garberoglio, Fondazione Scientifica Mauriziana (Italy); Jasjit S. Suri, Eigen Inc. (USA) . . . . [7968-14]

A compounded direct pixel beamforming method for medical ultrasound imaging, Chunsheng Piao, Yuhwa Lee, Taewan Kim, Jin Ho Chang, Yangmo Yoo, Tai-Kyong Song, Sogang Univ. (Korea, Republic of) . . [7968-32]

The new efficient multi-beamforming method base on multiple-access register block on a post-fractional filtering architecture, Jeeun Kang, Sogang Univ. (Korea, Republic of); Giduck Kim, Bionet Co., Ltd. (Korea, Republic of); Changhan Yoon, Yangmo Yoo, Tai-Kyong Song, Sogang Univ. (Korea, Republic of) . . . . [7968-33]

Impedance-controlled ultrasound probe, Matthew W. Gilbertson, Brian W. Anthony, Massachusetts Institute of Technology (USA) . . . . [7968-39]

Fast algorithm for respiratory motion correction in free-breathing contrast-enhanced ultrasound imaging, Zhang Ji, Mingyue Ding, Fan Meng, Yuchi Ming, Huazhong Univ. of Science and Technology (China) . . . . [7968-40]

Xampling in ultrasound imaging, Gilad Danin, Arie Feuer, Noam Wagner, Technion-Israel Institute of Technology (Israel); Zvi Fridman, GE Healthcare (Israel). . . [7968-41]

The causal lossy impulse response of a circular piston evaluated in the time and frequency domains for power law media, Christopher T. Johnson, Robert J. McGough, Michigan State Univ. (USA) . . . . . . [7968-42]

Bedside assistance in freehand ultrasonic diagnosis by real-time visual feedback of 3D scatter diagram of pulsatile tissue-motion, Masayuki Fukuzawa, Kazumasa Kawata, Nobuyuki Nakamori, Kyoto Institute of Technology (Japan); Yoshiki Kitsunezuka, Saiseikai Hyogo-ken Hospital (Japan). [7968-44]

Interference based speckle filter, Fernando M. Cardoso, Escola Politécnica da Univ. de São Paulo (Brazil); Monica M. Matsumoto, Instituto do Coração do Hospital das Clínicas (Brazil); Sergio S. Furuie, Escola Politécnica da Univ. de São Paulo (Brazil) . . . . [7968-45]

Pad-printed thick-film transducers for high-frequency and high-power applications, Wanda W. Wolny, Rasmus Lou-Moeller, Ferroperm Piezoceramics A/S (Denmark); Franck Levassort, Marc Lethiecq, Univ. François Rabelais (France); Jeffrey A. Ketterling, Erwan Filoux, Jonathan Mamou, Riverside Research Institute (USA); Ronald H. Silverman, Columbia Univ. Medical Ctr. (USA) . . . . [7968-46]

Ultrasound elastography using regularized phase-zero cost function initialized with dynamic programming, Shahin Sefati, Hassan Rivaz, Emad Boctor, Gregory D. Hager, The Johns Hopkins Univ. (USA) . . . . [7968-47]

Improved detectability of hypoechoic regions with short-lag spatial coherence imaging: experimental validation, Marko Jakovljevic, Jeremy J. Dahl, Gregg E. Trahey, Duke Univ. (USA) . . . . . . [7968-48]

Needle detection in 3D ultrasound, Guillaume Houël, Christian Wachinger, Nassir Navab, Technische Univ. München (Germany) . . . . [7968-49]
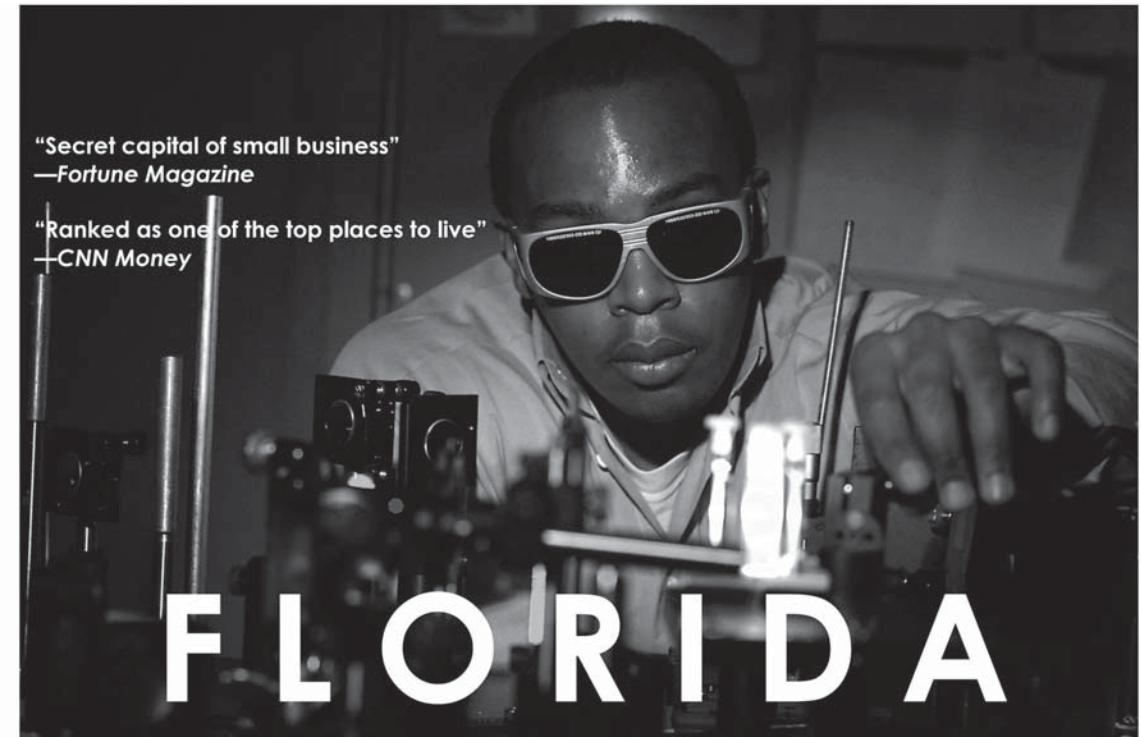
A user-friendly system for ultrasound carotid intima-media thickness image interpretation, Xiangjun Zhu, Arizona State Univ. (USA); Christopher Kendall, Robert Hurst, Mayo Clinic Scottsdale (USA); Jianming Liang, Arizona State Univ. (USA) . . . [7968-50]

Some observations on the optimal design of breast ultrasound tomography systems, Peter E. Huthwaite, Francesco Simonetti, Imperial College London (UK) . . . . . . [7968-51]

Multi-frequency super-resolution ultrasound imaging, Lianjie Huang, Los Alamos National Lab. (USA); Francesco Simonetti, Imperial College London (UK) . . . . [7968-52]

Navigation with local sensors in handheld 3D ultrasound: initial in-vivo experience, Philipp J. Stolka, Emad Boctor, The Johns Hopkins Outpatient Ctr. (USA) . . . [7968-53]

Is it possible to measure thermal expansion in real-time?, Hassan Rivaz, Philipp J. Stolka, Emad Boctor, The Johns Hopkins Outpatient Ctr. (USA) . . . [7968-55]

Conference 7961 continued	Conference 7962 continued	Conference 7964 continued	Conference 7965 continued	Conference 7968 continued
Physics of Medical Imaging	**Image Processing**	**Visualization, Image-guided Procedures and Modeling**	**Biomedical Applications in Molecular, Structural, and Functional Imaging**	**Ultrasonic Imaging and Signal Processing**
Room: Fiesta 5	Room: Fiesta 6	Room: Monterey 1-3	Room: Fiesta 8-10	Room: Fiesta 1-3

Conference 7961 — Physics of Medical Imaging

SESSION 5

Room: Fiesta 5 . . . . Mon. 8:00 to 9:40 am

Detectors I

Session Chairs: **John Yorkston,** Carestream Health Technology and Innovation Ctr.; **John A. Rowlands,** Thunder Bay Regional Health Sciences Ctr. (Canada)

8:00 am: **Novel synthesis of large area ZnTe:O films for high resolution imaging applications,** Vivek V. Nagarkar, Bipin Singh, Valeriy B. Gaysinskiy, Stuart R. Miller, Vladimir Gelfandbein, Harish Bhandari, Radiation Monitoring Devices, Inc. (USA) . . . . [7961-22]

8:20 am: **12-inch-wafer-scale CMOS active-pixel sensor for digital mammography,** Sung Kyn Heo, Jari Kosonen, Sung Ha Hwang, Tae Woo Kim, Vatech Humanray Co., Ltd. (Korea, Republic of); Seungman Yun, Pusan National Univ. (Korea, Republic of); Ho Kyung Kim, Vatech Humanray Co., Ltd. (Korea, Republic of) . . . . [7961-23]

8:40 am: **Noise performance limits of advanced x-ray imagers employing poly-Si-based active pixel circuit architectures,** Martin Koniczek, Youcef El-Mohri, Larry E. Antonuk, Qihua Zhao, Hao Jiang, Albert Liang, Univ. of Michigan (USA) . . . [7961-24]

9:00 am: **Characterization and comparison of lateral amorphous semiconductors with embedded Frisch grid detectors on 0.18μm CMOS processed substrate for medical imaging applications,** Christos Hristovski, Amir H. Goldan, Shaikh H. Majid, Kai Wang, Umar Shafique, Karim S. Karim, Univ. of Waterloo (Canada) . . . [7961-25]

9:20 am: **Low noise TFT arrays for digital x-ray imaging detectors,** Denny L. Lee, Directxray Digital Imaging Technology (USA) . . . . [7961-26]

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

Conference 7962 — Image Processing

SESSION 1

Room: Fiesta 6 . . . . Mon. 8:00 to 9:40 am

Keynote and Segmentation I

Session Chair: **Mona K. Garvine,** The Univ. of Iowa (USA)

8:00 am: **Medical image analysis: today's expectations and tomorrow's challenges** *(Keynote Presentation),* Milan Sonka, The Univ. of Iowa (USA) . . . . [7962-01]

9:00 am: **Comparison of fuzzy connectedness and graph cut segmentation algorithms,** Krzysztof C. Ciesielski, West Virginia Univ. (USA) and The Univ. of Pennsylvania (USA); Jayaram K. Udupa, The Univ. of Pennsylvania (USA); Alexandre X. Falcão, Paulo A. V. Miranda, Univ. Estadual de Campinas (Brazil) . . . . [7962-02]

9:20 am: **Automated multimodality concurrent classification for segmenting vessels in 3D spectral OCT and color fundus images,** Zhihong Hu, The Univ. of Iowa (USA); Michael D. Abramoff, Meindert Niemeijer, The Univ. of Iowa Hospitals and Clinics (USA); Mona K. Garvin, The Univ. of Iowa (USA) . . . . [7962-03]

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

Conference 7964 — Visualization, Image-guided Procedures and Modeling

SESSION 5

Room: Monterey 1-3 . . . .Mon. 8:00 to 9:40 am

Lung

Session Chairs: **Jay B. West,** Accuray, Inc.; **Steven L. Hartmann,** Medtronic Navigation

8:00 am: **Real-time method for bronchoscope motion measurement and tracking,** William E. Higgins, Duane C. Cornish, The Pennsylvania State Univ. (USA) . . . . [7964-21]

8:20 am: **Visualization of 3D lung airway compliance and reactance using fractal 3D lung airways and impulse oscillometry measurements,** Anand P. Santhanam, Akash P. Bhargava, Rebecca Mitchell, Nicolene Papp, Bari H. Ruddy, CREOL, The College of Optics and Photonics, Univ. of Central Florida (USA); Sanford Meeks, M.D. Anderson Cancer Ctr. Orlando (USA) . . . . [7964-22]

8:40 am: **Surface modeling and segmentation of the 3D airway wall in MSCT,** Margarete Ortner, Catalin Fetita, TELECOM SudParis, Institut TELECOM (France); Pierre-Yves Brillet, Avicenne Hospital (France); Françoise Prêteux, TELECOM & Management SudParis (France); Philippe A. Grenier, Pitié-Salpêtrière Hospital (France) . . . . . [7964-23]

9:00 am: **Evaluation of electromagnetically tracked transbronchial needle aspiration in a ventilated porcine lung,** Ingmar Gergel, Tetzlaff Ralf, Hans-Peter Meinzer, Ingmar Wegner, Deutsches Krebsforschungszentrum (Germany) . . . . [7964-24]

9:20 am: **On scale invariant features and sequential Monte Carlo sampling for bronchoscope tracking,** Xióngbiao Luó, Nagoya Univ. (Japan); Marco Feuerstein, Technische Univ. München (Germany); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kensaku Mori, Nagoya Univ. (Japan) . . . . [7964-25]

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

Conference 7965 — Biomedical Applications in Molecular, Structural, and Functional Imaging

SESSION 5

Room: Fiesta 8-10 . . . . . .Mon. 8:00 to 9:40 am

Brain Imaging II: Image Based Analysis

Session Chair: **Armando Manduca,** Mayo Clinic College of Medicine

8:00 am: **Effect of registration on corpus callosum population differences found with DBM analysis,** Zhaoying Han, Tricia A. Thornton-Wells, John C. Gore, Benoit M. Dawant, Vanderbilt Univ. (USA). . . [7965-23]

8:20 am: **Automated segmentation of ventricles from serial brain MRI for the quantification of volumetric changes associated with communicating hydrocephalus in patients with brain tumor,** John A. Pura, John A. Butman, Marius George Linguraru, National Institutes of Health (USA) . . . . [7965-24]

8:40 am: **Assessment of variability in cerebral vasculature for neuro-anatomical surgery planning in rodent brain,** Janaki Raman Rangarajan, Kris van Kuyck, Uwe Himmelreich, Bart Nuttin, Frederik Maes, Paul Suetens, Katholieke Univ. Leuven (Belgium) . . . . [7965-25]

9:00 am: **Using tensor-based morphometry to detect structural brain abnormalities in rats with intermittent alcohol exposure,** Beatriz Paniagua, The Univ. of North Carolina at Chapel Hill (USA); Cindy Ehlers, The Scripps Research Institute (USA); Fulton Crews, Francois Budin, Garrett Larson, The Univ. of North Carolina at Chapel Hill (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill School of Medicine (USA); Ipek Oguz, The Univ. of North Carolina at Chapel Hill (USA)[7965-26]

9:20 am: **Functional connectivity comparison of the default mode network in non-depressed Parkinson disease and depressed Parkinson disease,** Yuan Han, Rui Li, Li Yao, Xia Wu, Beijing Normal Univ. (China) . . . . [7965-27]

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

Conference 7968 — Ultrasonic Imaging and Signal Processing

SESSION 5

Room: Fiesta 1-3 . . . . . .Mon. 8:00 to 9:40 am

Modeling for Ultrasound System Design

Session Chair: **Jan D'hooge,** Katholieke Univ. Leuven (Belgium)

8:00 am: **Finite element model of transducer array systems for 3D ultrasound computer tomography,** Benedikt Kohout, Georg Göbel, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany) . . . . [7968-23]

8:20 am: **Comparison of simulated and measured nonlinear ultrasound fields,** Yigang Du, Technical Univ. of Denmark (Denmark) and B-K Medical (Denmark); Henrik Jensen, B-K Medical (Denmark); Jørgen A. Jensen, Technical Univ. of Denmark (Denmark). . . . . [7968-24]

8:40 am: **Fast k-space based evaluation of imaging properties of ultrasound apertures,** Michael Zapf, Robin Dapp, Marcus Hardt, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany) [7968-25]

9:00 am: **Transmit beamforming techniques for suppressing grating lobes in large pitch ultrasonic phased arrays,** Zahra Torbatian, Robert B. A. Adamson, Manohar Bance, Jeremy A. Brown, Dalhousie Univ. (Canada) . . . . . . [7968-26]

9:20 am: **A practical, robust approach to high resolution ultrasonic breast tomography,** Peter E. Huthwaite, Francesco Simonetti, Imperial College London (UK) . . . . [7968-27]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 6
Room: Fiesta 5 . . Mon. 10:10 am to 12:10 pm

Detectors II

Session Chairs: **Karim S. Karim,** Univ. of Waterloo (Canada); **Mats Danielsson,** Royal Institute of Technology (Sweden)

10:10 am: Performance characterization of a silicon strip detector for spectral computed tomography utilizing a laser testing system, Cheng Xu, Mats Danielsson, Staffan Karlsson, Hans Bornefalk, Royal Institute of Technology (Sweden) . . . [7961-27]

10:30 am: Quantum-counting CT in the regime of count-rate paralysis: introduction of the pile-up trigger method, Steffen G. Kappler, Susanne Hoelzer, Edgar Kraft, Karl Stierstorfer, Thomas Flohr, Siemens Healthcare (Germany) . . . [7961-28]

10:50 am: 6-Li enriched Cs₂LiYCl₆:Ce based thermal neutron detector coupled with CMOS solid-state photomultipliers for a portable detector unit, Chad Whitney, Christopher J. Stapels, Erik B. Johnson, Eric C. Chapman, Guy Alberghini, Jarek Glodo, Kanai Shah, James F. Christian, Radiation Monitoring Devices, Inc. (USA) . . . . [7961-29]

11:10 am: Integration of an amorphous silicon passive pixel sensor array with a lateral amorphous selenium detector for indirect conversion x-ray imaging applications, Kai Wang, Univ. of Waterloo (Canada) and Thunder Bay Regional Research Institute (Canada); Mohammad Y. Yazdandoost, Kyung-Wook Shin, Feng Chen, Shaikh H. Majid, Shiva Abbaszadeh, Rasoul Keshavarzi, Michael Mayer, Karim S. Karim, Univ. of Waterloo (Canada) [7961-30]

11:30 am: Simulation of one-dimensionally polarized X-ray semiconductor detectors, Klaus Jürgen Engel, Christoph Herrmann, Philips Research (Germany) . . . . [7961-31]

11:50 am: Electrical interface characteristics (i-v), optical time of flight measurements, and the x-ray (20 kev) signal response of amorphous-selenium/crystalline-silicon heterojunction structures, David M. Hunter, Sunnybrook Health Sciences Ctr. (Canada); Chu An Ho, Univ. of Toronto (Canada); George Belev, Canadian Light Source (Canada); Giovanni De Crescenzo, Thunder Bay Research Institute (Canada); Martin J. Yaffe, Sunnybrook Health Sciences Ctr. (Canada) . . . . [7961-32]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 2
Room: Fiesta 6 . . Mon. 10:10 am to 12:10 pm

Cardiac Applications:

Session Chair: **Wiro J. Niessen,** Erasmus MC (Netherlands)

10:10 am: Simultaneous detection of landmarks and key-frames in Cardiac perfusion MRI using a joint spatial-temporal model, Xiaoguang Lu, Hui Xue, Marie-Pierre Jolly, Christoph Guetter, Siemens Corporate Research (USA); Peter Kellman, Li-Yueh Hsu, Andrew E. Arai M.D., National Institutes of Health (USA); Sven Zuehlsdorff, Siemens Corporation (USA); Arne Littmann, Siemens AG (Germany); Bogdan Georgescu, Jens Guehring, Siemens Corporate Research (USA) . . . . [7962-04]

10:30 am: Statistical fusion of continuous labels: identification of cardiac landmarks, Fangxu Xing, Sahar Soleimanifard, Jerry L. Prince, The Johns Hopkins Univ. (USA); Bennett A. Landman, Vanderbilt Univ. (USA) . . . . [7962-05]

10:50 am: Automated planning of ablation targets in atrial fibrillation treatment, Johannes Keustermans, Stijn De Buck, Hein Heidbüchel, Paul Suetens, Katholieke Univ. Leuven (Belgium) . . . . [7962-06]

11:10 am: Groupwise registration of cardiac perfusion MRI sequences using normalized mutual information in high dimension, Sameh Hamrouni, Nicolas F. Rougon, TELECOM & Management SudParis (France); Françoise Prêteux, Mines ParisTech (France). . . . . [7962-07]

11:30 am: A comparison of cost functions for data-driven motion estimation in myocardial perfusion SPECT imaging, Joyeeta M. Mukherjee, Univ. of Massachusetts Medical School (USA); Brian F. Hutton, Univ. College Hospital (UK); Michael A. King, Univ. of Massachusetts Medical School (USA) . . . . [7962-08]

11:50 am: Automatic evaluation of the Valsalva sinuses from cine-MRI, Cédric Blanchard, Tadeusz Sliwa, Alain Lalande, Pauliah Mohan, Olivier Bouchot, Yvon Voisin, Univ. de Bourgogne (France). . . . . . . [7962-09]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

SESSION 6
Room: Monterey 1-3 . . . . . . .Mon. 10:10 am to 12:10 pm

Keynote and Ultrasound Guided Intervention

Session Chairs: **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ.; **Jan D'hooge,** Katholieke Univ. Leuven (Belgium)

Joint Session with Conference 7968: Ultrasonic Imaging, Tomography, and Therapy

10:10 am: Ultrasound guidance of cardiac interventions *(Keynote Presentation)*, Terry M. Peters, Gerard M. Guiraudon, Robarts Research Institute (Canada); Doug L. Jones, The Univ. of Western Ontario (Canada); Cristian A. Linte, Robarts Research Institute (Canada) . . . . [7968-28]

10:50 am: Quantification of prostate deformation due to needle insertion during TRUS-guided biopsy: comparison of hand-held and mechanically stabilized systems, Tharindu S. De Silva, Jeffrey S. Bax, Aaron Fenster, Robarts Research Institute (Canada); Jagath K. Samarabandu, The Univ. of Western Ontario (Canada); Aaron D. Ward, Robarts Research Institute (Canada) . . . . [7968-29]

11:10 am: A hybrid surface/image based approach to facilitate ultrasound/CT registration, Seth Billings, The Johns Hopkins Univ. (USA) and National Institutes of Health (USA); Ankur Kapoor, Bradford J. Wood, National Institutes of Health (USA); Emad Boctor, The Johns Hopkins Univ. (USA) . . . . [7968-30]

11:30 am: Calibration of a 3D ultrasound system to an electromagnetic tracking system, Andrew Lang, The Johns Hopkins Univ. (USA); Vijay Parthasarathy, Ameet Jain, Philips Research North America (USA) . . . . [7968-31]

11:50 am: Section-thickness profiling for brachytherapy ultrasound guidance, Mohammad Peikari, Thomas K. Chen, Queen's Univ. (Canada); Everette C. Burdette, Acoustic MedSystems, Inc. (USA); Gabor Fichtinger, Queen's Univ. (Canada) . . . . [7964-26]

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

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

SESSION 6
Room: Fiesta 8-10 Mon. 10:10 am to 12:10 pm

Magnetic Particle Imaging

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

10:10 am: Novel hardware developments in magnetic particle imaging, Thorsten M. Buzug, Timo F. Sattel, Marlitt Erbe, Sven Biederer, Dominique Finas, Klaus Diedrich, Florian Vogt, Jörg Barkhausen, Kerstin Lüdtke-Buzug, Tobias Knopp, Univ. zu Lübeck (Germany) . . . . [7965-28]

10:30 am: Experimental demonstration of x-space magnetic particle imaging, Patrick Goodwill, Steven Conolly, Univ. of California, Berkeley (USA) . . . . [7965-29]

10:50 am: Quantifying receptor density in vivo, using a dual probe approach with fluorescence molecular imaging, K. M. Tichauer, Dartmouth College (USA); K. S. Samkoe, Dartmouth College (USA) and Dartmouth Medical School (USA); K. J. Sexton, S. Davis, Dartmouth College (USA); B. W. Pogue, Dartmouth College (USA) and Dartmouth Medical School (USA) . . . . [7965 96]

11:10 am: Biocompatible magnetite (Fe₃O₄) nanoparticles optimized for MPI spatial resolution, R. Matthew Ferguson, Amit P. Khandhar, Kannan M. Krishnan, Univ. of Washington (USA) . . . . [7965-31]

11:30 am: Development of a field free line magnet for projection MPI, Justin Konkle, Patrick Goodwill, Steven Conolly, Univ. of California, Berkeley (USA) . . . . [7965-32]

11:50 am: MSB estimation chemical binding affinity, John B. Weaver, Dartmouth Hitchcock Medical Ctr. (USA); Adam M. Rauwerdink, Dartmouth College (USA) . . . . [7965-33]

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

Conference 7968 continued
Ultrasonic Imaging and Signal Processing
Room: Monterey 1-3

SESSION 6
Room: Monterey 1-3 . . . . . . .Mon. 10:10 am to 12:10 pm

Keynote and Ultrasound Guided Intervention

Session Chairs: **Kenneth H. Wong,** Virginia Polytechnic Institute and State Univ.; **Jan D'hooge,** Katholieke Univ. Leuven (Belgium)

Joint Session with Conference 7964: Visualization, Image-guided Procedures and Modeling

10:10 am: Ultrasound guidance of cardiac interventions *(Keynote Presentation),* Terry M. Peters, Gerard M. Guiraudon, Robarts Research Institute (Canada); Doug L. Jones, The Univ. of Western Ontario (Canada); Cristian A. Linte, Robarts Research Institute (Canada) . . . . [7968-28]

10:50 am: Quantification of prostate deformation due to needle insertion during TRUS-guided biopsy: comparison of hand-held and mechanically stabilized systems, Tharindu S. De Silva, Jeffrey S. Bax, Aaron Fenster, Robarts Research Institute (Canada); Jagath K. Samarabandu, The Univ. of Western Ontario (Canada); Aaron D. Ward, Robarts Research Institute (Canada) . . . . [7968-29]

11:10 am: A hybrid surface/image based approach to facilitate ultrasound/CT registration, Seth Billings, The Johns Hopkins Univ. (USA) and National Institutes of Health (USA); Ankur Kapoor, Bradford J. Wood, National Institutes of Health (USA); Emad Boctor, The Johns Hopkins Univ. (USA) . . . . [7968-30]

11:30 am: Calibration of a 3D ultrasound system to an electromagnetic tracking system, Andrew Lang, The Johns Hopkins Univ. (USA); Vijay Parthasarathy, Ameet Jain, Philips Research North America (USA) . . . . [7968-31]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

Conference 7962 continued
Image Processing
Room: Fiesta 6

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

Conference 7968 continued
Ultrasonic Imaging and Signal Processing
Room: Fiesta 1-3

SESSION 7
Room: Fiesta 5 . . . . . . .Mon. 1:20 to 3:40 pm

Breast Imaging
Session Chairs: **Anders Tingberg,** Skåne Univ. Hospital, Malmö (Sweden); **Stephen J. Glick,** Univ. of Massachusetts Medical School

1:20 pm: **Photoacoustic imaging of the breast**, Robert A. Kruger, Richard B. Lam, Daniel R. Reinecke, Stephen P. Del Rio, OptoSonics, Inc. (USA) . . . . [7961-33]

1:40 pm: **Comparison of 3D and 2D breast density estimation from synthetic ultrasound tomography images and digital mammograms of anthropomorphic software breast phantoms**, Predrag R. Bakic, The Univ. of Pennsylvania Health System (USA); Cuiping Li, Erik West, Mark A. Sak, Karmanos Cancer Institute (USA); Sara Gavenonis, The Univ. of Pennsylvania Health System (USA); Nebojsa Duric, Karmanos Cancer Institute (USA); Andrew D. Maidment, The Univ. of Pennsylvania Health System (USA). . . . . [7961-34]

2:00 pm: **The effect of characteristic x-rays on the spatial and spectral resolution of a CZT based detector for breast CT**, Stephen J. Glick, Univ. of Massachusetts Medical School (USA); Clay S. Didier, Massachusetts Institute of Technology (USA) . . . . [7961-35]

2:20 pm: **Analysis of multilayer and single layer x-ray detectors for contrast-enhanced mammography using imaging task**, Nicholas Allec, Shiva Abbaszadeh, Karim S. Karim, Univ. of Waterloo (Canada) . . [7961-36]

2:40 pm: **Optimization of mammography with respect to anatomical noise**, Erik Fredenberg, Björn Cederström, Royal Institute of Technology (Sweden); Björn Svensson, Sectra Mamea AB (Sweden); Mats Danielsson, Royal Institute of Technology (Sweden) . . . . [7961-37]

3:00 pm: **Issues in characterizing anatomic structure in digital breast tomosynthesis**, Beverly A. Lau, Ingrid S. Reiser, Robert M. Nishikawa, The Univ. of Chicago (USA). . . . . [7961-38]

SESSION 3
Room: Fiesta 6 . . . . . . .Mon. 1:20 to 3:40 pm

Skeletal and Orthopedic Applications
Session Chair: **Punam K. Saha,** The Univ. of Iowa

1:20 pm: **A variational approach to bone segmentation in CT images**, Jeffrey W. Calder, Queen's Univ. (Canada); Amir M. Tahmasebi, The Rotman Research Institute (Canada); Abdol-Reza Mansouri, Queen's Univ. (Canada) . . . . [7962-10]

1:40 pm: **Fully automatic detection of the vertebrae in 2D CT images**, Franz Graf, Hans-Peter Kriegel, Matthias Schubert, Michael Strukelj, Ludwig-Maximilians-Univ. München (Germany); Alexander Cavallaro, Universitätsklinikum Erlangen (Germany) . . . . [7962-11]

2:00 pm: **Segmentation of vertebral bodies in MR and CT images based on a 3D deterministic model**, Darko Štern, Tomaž Vrtovec, Boštjan Likar, Franjo Pernuš, Univ. of Ljubljana (Slovenia) . . . . [7962-12]

2:20 pm: **Manifold learning for automatically predicting articular cartilage morphology in the knee with data from the osteoarthritis initiative (OAI)**, Claire R. Donoghue, Imperial College London (UK); Anil Rao, GlaxoSmithKline (UK); Anthony M. J. Bull, Daniel Rueckert, Imperial College London (UK) . . . . [7962-13]

2:40 pm: **Determination of vertebral pose in 3D by minimization of vertebral asymmetry**, Tomaž Vrtovec, Franjo Pernuš, Boštjan Likar, Univ. of Ljubljana (Slovenia). . . . . [7962-14]

3:00 pm: **Femur specific polyaffine model to regularize the log-domain demons registration**, Christof Seiler, Univ. Bern (Switzerland); Xavier Pennec, INRIA Sophia Antipolis - Méditerranée (France); Lucas Ritacco, Hospital Italiano de Buenos Aires (Argentina); Mauricio Reyes, Univ. Bern (Switzerland) . . . . [7962-15]

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

Neuro
Session Chairs: **Guy Shechter,** Philips Medical Systems; **Terry M. Peters,** Robarts Research Institute (Canada)

1:20 pm: **Momentum-based morphometric analysis with application to Parkinson's disease**, Jingyun Chen, Ali R. Khan, Simon Fraser Univ. (Canada); Martin J. McKeown, The Univ. of British Columbia (Canada); Mirza F. Beg, Simon Fraser Univ. (Canada) . . . . [7964-27]

1:40 pm: **Potential predictors for the amount of intra-operative brain shift during deep brain stimulation surgery**, Ryan D. Datteri, Srivatsan Pallavaram, Peter Konrad, Joseph Neimat, Pierre-François D'Haese, Benoit M. Dawant, Vanderbilt Univ. (USA) . . . . [7964-28]

2:00 pm: **Simulation of brain tumor resection in image-guided neurosurgery**, Xiaoyao Fan, Songbai Ji, Kathryn Fontaine, Dartmouth College (USA); Alex Hartov, David W. Roberts, Keith D. Paulsen, Dartmouth College (USA) and Dartmouth Hitchcock Medical Ctr. (USA) . . . . [7964-29]

2:20 pm: **Optimizing nonrigid registration performance between volumetric true 3D ultrasound images in image-guided neurosurgery**, Songbai Ji, Xiaoyao Fan, Dartmouth College (USA); David W. Roberts, Dartmouth Hitchcock Medical Ctr. (USA); Alex Hartov, Keith D. Paulsen, Dartmouth College (USA) . . . . [7964-30]

2:40 pm: **Improved geometric factors for predicting disturbed flow at the normal carotid bifurcation**, Payam B. Bijari, Univ. of Toronto (Canada); Luca Antiga, Orobix Srl (Italy); David A. Steinman, Univ. of Toronto (Canada) . . . . [7964-31]

3:00 pm: **Clinical study of model-based blood flow quantification on cerebrovascular data**, Alexandra Groth, Irina Waechter-Stehle, Philips Research (Germany); Olivier Brina, Fabienne Perren, Daniel Ruefenacht, Univ. Hospital of Geneva (Switzerland); Tom Bruijns, Philips Medical Systems International B.V. (Netherlands); Matthias Bertram, Jürgen Weese, Philips Research (Germany) . . . . [7964-32]

SESSION 7
Room: Fiesta 8-10. . . . .Mon. 1:20 to 3:40 pm

Keynote and Nanoparticle Imaging
Session Chairs: **John B. Weaver,** Dartmouth Hitchcock Medical Ctr.; **Robert C. Molthen,** Medical College of Wisconsin

1:20 pm: **MPI cell tracking: What can we learn from MRI?** *(Keynote Presentation)*, Jeff W. Bulte, The Johns Hopkins Univ. (USA) . . . . [7965-34]

2:20 pm: **First phantom and in vivo images for an extended field of view from MPI**, Ingo Schmale, Juergen Kanzenbach, Joachim D. Schmidt, Juergen Rahmer, Claas Bontus, Bernhard Gleich, Philips Technologie GmbH (Germany); Oliver Woywode, Philips Medizin Systeme GmbH (Germany); Joern Borgert, Philips Technologie GmbH (Germany) . . . [7965-35]

2:40 pm: **Multi-modality PET-CT imaging of breast cancer in an animal model using nanoparticle x-ray contrast agent and 18F-FDG**, Cristian T. Badea, Ctr. for In Vivo Microscopy (USA) . . . . [7965-36]

3:00 pm: **Preliminary clinical results: an analyzing tool for 2D optical imaging in detection of active inflammation in rheumatoid arthritis**, Radin Adi Aizudin Bin Radin Nasirudin, Reinhard Meier, Carmen Ahari, Matti Sievert, Technische Univ. München (Germany); Martin Fiebich, Fachhochschule Giessen-Friedberg (Germany); Ernst J. Rummeny, Peter B. Noel, Technische Univ. München (Germany) . . . . [7965-37]

3:20 pm: **An image analysis system for near-infrared (NIR) fluorescence lymph imaging**, Jingdan Zhang, S. Kevin Zhou, Xiaoyan Xiang, Siemens Corporate Research (USA); John C. Rasmussen, Eva M. Sevick-Muraca, The Univ. of Texas Health Science Ctr. at Houston (USA) . . . . [7965-38]

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

SESSION 7
Room: Fiesta 1-3. . . . . .Mon. 1:20 to 3:20 pm

Vascular Imaging and Ultrasound Beam Forming
Session Chair: **Marvin M. Doyley,** | Univ. of Rochester

1:20 pm: **Experimental observation of super-resolution imaging in highly attenuative materials**, Francesco Simonetti, Tim Hutt, Imperial College London (UK) . . . . [7968-34]

1:40 pm: **An object-oriented multi-threaded software beam formation toolbox**, Jens M. Hansen, Jørgen A. Jensen, Technical Univ. of Denmark (Denmark) . . . . [7968-35]

2:00 pm: **Feasibility of a combined B-mode (ARFI) colorflow Doppler system for real-time, volumetric scanning**, Douglas M. Dumont, Seung Yun Lee, Joshua R. Doherty, Gregg E. Trahey, Duke Univ. (USA) . . . . [7968-36]

2:20 pm: **Turbulence intensity in a region of interest 2cm distal to the carotid bifurcation in a family of seven anthropomorphic flow phantoms**, Janet L. Powell, Tamie L. Poepping, The Univ. of Western Ontario (Canada) . . . . . . [7968-37]

2:40 pm: **Left ventricular 2D flow pattern estimation by combining speckle tracking with Navier-Stokes based regularization in an iterative way**, Hang Gao, Florence Kremer, Hon Fai Choi, Jens-Uwe Voigt, Piet Claus, Jan D'hooge, Katholieke Univ. Leuven (Belgium) . . . . [7968-38]

3:00 pm: **In-vivo breast imaging with ultrasound tomography: results at the Karmanos Cancer Institute,** Erik West, Nebojsa Duric, Peter J. Littrup, Cuiping Li, Karmanos Cancer Institute (USA) . [7968-54]

Poster Award Announcements
Room: Fiesta 1-3 . . . . Mon. 3:20 to 3:25 pm

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

Conference 7961 continued
Physics of Medical Imaging

Room: Fiesta 5

SESSION 7 continued
Room: Fiesta 5 . . . . Mon. 1:20 to 3:40 pm

3:20 pm: **Evaluation of photon-counting spectral breast tomosynthesis**, Nils Dahlman, Erik Fredenberg, Royal Institute of Technology (Sweden); Magnus Åslund, Björn Svensson, Sectra Mamea AB (Sweden); Felix Diekmann, Charité Universitätsmedizin Berlin (Germany); Mats Danielsson, Royal Institute of Technology (Sweden) . . . . [7961-39]

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

Conference 7962 continued
Image Processing

Room: Fiesta 6

SESSION 3 continued
Room: Fiesta 6 . . . . Mon. 1:20 to 3:40 pm

3:20 pm: **Segmentation of knee joints in x-ray images using decomposition-based sweeping and graph search**, Jian Mu, Xiaomin Liu, Univ. of Notre Dame (USA); Shuang Luan, Philip H. Heintz, Gary W. Mlady, The Univ. of New Mexico (USA); Danny Z. Chen, Univ. of Notre Dame (USA) . . . . [7962-16]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling

Room: Monterey 1-3

SESSION 7 continued
Room: Monterey 1-3 . . . .Mon. 1:20 to 3:40 pm

3:20 pm: **Estimating blood flow velocity in angiographic image data**, Clemens M. Hentschke, Steffen Serowy, Gábor Janiga, Georg Rose, Klaus D. Toennies, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . [7964-33]

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

Best Student Paper Award, SPIE Fellows Award, and Plenary Presentation

Monday 14 February · 4:00 to 5:00 pm · Coronado H. Ballroom

Symposium Chairs: **Maryellen L. Giger,** The Univ. of Chicago; **Joseph M. Reinhardt,** The Univ. of Iowa

Student Paper Award

SPIE Fellows Award

Plenary Presentation: **The Expanding Role of Physics and Engineering in Medical Imaging**

Dr. William Hendee, Medical College of Wisconsin

See page 2 for details.

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 8
Room: Fiesta 5 . . . . Tues. 8:00 to 9:40 am

Tomosynthesis I: Reconstruction

Session Chairs: **John M. Sabol**, GE Healthcare; **Michael Grass**, Philips Technologie GmbH (Germany)

8:00 am: **Tomosynthesis imaging with 2D scanning trajectories**, Kedar B. Khare, Bernhard E. Claus, Jeffrey W. Eberhard, GE Global Research (USA) . . . . [7961-40]

8:20 am: **Dynamic reconstruction and rendering of 3D tomosynthesis images**, Susan Ng, Peter A. Ringer, Real-Time Tomography, LLC (USA); Andrew D. Maidment, Predrag R. Bakic, The Univ. of Pennsylvania Health System (USA); Johnny Kuo, Steven G. Fallows, Real-Time Tomography, LLC (USA) . . . . [7961-41]

8:40 am: **Adaptive diffusion regularization for enhancement of microcalcifications in digital breast tomosynthesis (DBT) reconstruction**, Yao Lu, Heang-Ping Chan, Jeffrey A. Fessler, Lubomir M. Hadjiiski, Jun Wei, Mitchell M. Goodsitt, Univ. of Michigan (USA) . . . . [7961-42]

9:00 am: **Comparison of model-observer and human-observer performance for breast tomosynthesis: effect of reconstruction and acquisition parameters**, Mini Das, Howard C. Gifford, Univ. of Massachusetts Medical School (USA) . . . . [7961-43]

9:20 am: **A second pass correction method for calcification artifacts in digital breast tomosynthesis**, Klaus Erhard, Michael Grass, Tim Nielsen, Philips Research (Germany) . . . . [7961-44]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 4
Room: Fiesta 6 . . . . Tues. 8:00 to 9:40 am

Session Chair: **Murray H. Loew**, The George Washington Univ.

8:00 am: **Integrated segmentation of cellular structures**, Peter O. Ajemba, Yousef Al-Kofahi, Richard Scott, Michael J. Donovan, Gerardo Fernandez M.D., Aureon Biosciences, Inc. (USA) . . . . [7962-17]

8:20 am: **Identification and classification of cells in multispectral microscopy images of lymph nodes**, Xiaomin Liu, Univ. of Notre Dame (USA); Alvernia F. Setiadi, Stanford Univ. (USA); Mark S. Alber, Univ. of Notre Dame (USA); Peter Lee, Stanford Univ. (USA); Danny Z. Chen, Univ. of Notre Dame (USA). . . . . [7962-18]

8:40 am: **Development of a stained cell nuclei counting system**, Niranjan Timilsina, Christopher Moffatt, Kazunori Okada, San Francisco State Univ. (USA) . . . . . . [7962-19]

9:00 am: **Texture analysis of clinical radiographs using radon transform on a local scale for differentiation between post-menopausal women with and without hip fracture**, Holger F. Boehm M.D., Markus Koerner M.D., Bernhard Baumert M.D., Ulrich Linsenmaier M.D., Maximilian Reiser M.D., Ludwig-Maximilians-Univ. München (Germany) . . . . [7962-20]

9:20 am: **Detection of rheumatoid arthritis using infrared thermal imaging,** Monique Frize, Cynthia Adea, Abiola Ogungbemile, Carleton Univ. (Canada); Gina Di Primio M.D., Univ. of Ottawa (Canada) and The Ottawa Hospital (Canada); Pierre Payeur, Univ. of Ottawa (Canada); Jacob Karsh, The Ottawa Hospital (Canada) . . . .[7962-21]]

Poster Award Announcements
Room: Fiesta 6 . . . . . Tues. 9:40 to 9:45 am

The Image Processing conference poster award recipients will be recognized and certificates distributed.

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 1
Room: Fiesta 1-3. . . . . Tues. 8:00 to 9:40 am

Keynote and Bone CAD

Session Chairs: **Ronald M. Summers**, National Institutes of Health; **Bram van Ginneken**, Univ. Medical Ctr. Utrecht (Netherlands)

8:00 am: **CAD: past, present, and future** *(Keynote Presentation),* Heang-Ping Chan, Univ. of Michigan Health System (USA) . . . . [7963-01]

9:00 am: **Automatic lumbar vertebra segmentation from clinical CT for wedge compression fracture diagnosis**, Subarna Ghosh, Raja S. Alomari, Vipin Chaudhary, Univ. at Buffalo (USA); Gurmeet S. Dhillon, Proscan Imaging, LLC (USA). . . . . [7963-02]

9:20 am: **Lumbar spinal stenosis CAD from clinical MRM and MRI based on inter- and intra-context features with a two-level classifier**, Jaehan Koh, Raja S. Alomari, Vipin Chaudhary, Univ. at Buffalo (USA); Gurmeet S. Dhillon, Proscan Imaging, LLC (USA) . . . . [7963-03]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

SESSION 8
Room: Monterey 1-3. . . Tues. 8:00 to 9:40 am

Cardiac Applications

Session Chairs: **Frank Sauer**, Siemens Corporate Research; **Robert J. Webster III**, Vanderbilt Univ.

8:00 am: **Automatic detection of contrast injection on fluoroscopy and angiography for image-guided trans-catheter aortic valve implantations (TAVI)**, Rui Liao, Wei You, Michelle Yan, Siemens Corporate Research (USA) . . . . [7964-34]

8:20 am: **A patient-specific visualization tool for comprehensive analysis of coronary CTA and perfusion MRI data**, Hortense A. Kirisli, Erasmus MC (Netherlands); Vikas Gupta, Leids Univ. Medisch Ctr. (Netherlands); Sharon Kirschbaum, Lisan Neefjes, Robert-Jan van Geuns, Nico Mollet, Erasmus MC (Netherlands); Boudewijn P. F. Lelieveldt, Johan Reiber, Leids Univ. Medisch Ctr. (Netherlands); Theo van Walsum, Wiro Niessen, Erasmus MC "(Netherlands) . . . . [7964-35]

8:40 am: **Modeling the catheter tip as a Gaussian point cloud for improved registration of preoperative surface models**, Maryam E. Rettmann, David R. Holmes III, Douglas Packer, Richard Robb, Mayo Clinic (USA) . . . . [7964-36]

9:00 am: **Patient specific optimal catheter selection for right coronary artery**, Sami U. Rahman, Stefan Wesarg, Technische Univ. Darmstadt (Germany) . . . . . [7964-37]

9:20 am: **Data fusion for catheter tracking using Kalman filtering: applications in robot-assisted catheter insertion,** Mahdi Azizian, Rajni Patel, The Univ. of Western Ontario (Canada) and Canadian Surgical Technologies and Advanced Robotics (CSTAR) (Canada) . . . . [7964-38]

Poster Award Announcements
Room: Monterey 1-3. Tues. 9:40 to 9:45 am

The Visualization, Image-guided Procedures and Modeling conference poster award recipients will be recognized and certificates distributed.

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

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

SESSION 8
Room: Fiesta 8-10. . . . Tues. 8:00 to 9:40 am

Brain Imaging III: Function

Session Chairs: **Armando Manduca**, Mayo Clinic College of Medicine; **Thorsten M. Buzug**, Univ. zu Lübeck (Germany)

8:00 am: **A new methodology for detecting source number in MEG magnetic source imaging**, Tianhu Lei, Timothy P. L. Roberts, The Children's Hospital of Philadelphia (USA) . . . [7965-39]

8:20 am: **A retrospective study of white matter integrity in mild cognitive impairment**, Thomas van Bruggen, Bram Stieltjes, Hans-Peter Meinzer, Klaus H. Fritzsche, Deutsches Krebsforschungszentrum (Germany) . . . . [7965-40]

8:40 am: **Rebuilding the injured brain: use of MRS in clinical regenerative medicine**, Alina Zare, Univ. of Missouri-Columbia (USA); Michael Weiss, Paul Gader, Univ. of Florida (USA) . . . . [7965-41]

9:00 am: **Sparse brain network using penalized linear regression**, Hyekyoung Lee, Dong Soo Lee, Hyejin Kang, Seoul National Univ. College of Medicine (Korea, Republic of) and Seoul National Univ. (Korea, Republic of); Boong-Nyun Kim, Seoul National Univ. College of Medicine (Korea, Republic of); Moo K. Chung, Seoul National Univ. (Korea, Republic of) and Univ. of Wisconsin-Madison (USA) . . . . . [7965-42]

9:20 am: **MAP-based denoising of dynamic PET data for quantitative receptor imaging**, Naoki Hoshino, Hidekata Hontani, Nagoya Institute of Technology (Japan); Kazuya Sakaguchi, Kitasato Univ. (Japan); Muneyuki Sakata, Kiichi Ishiwata, Tokyo Metropolitan Institute of Gerontology (Japan); Yuichi Kimura, National Institute of Radiological Science (Japan) . . . . .[7965-43

Poster Award Announcements
Room: Fiesta 8-10 . . . . Tues. 9:40 to 9:45 am

The Biomedical Applications in Molecular, Structural, and Functional Imaging conference poster award recipients will be recognized and certificates distributed.

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

Conference 7961 continued	Conference 7962 continued	Conference 7963 continued	Conference 7964 continued	Conference 7965 continued
Physics of Medical Imaging	**Image Processing**	**Computer-Aided Diagnosis**	**Visualization, Image-guided Procedures and Modeling**	**Biomedical Applications in Molecular, Structural, and Functional Imaging**
Room: Fiesta 5	Room: Fiesta 6	Room: Fiesta 1-3	Room: Monterey 1-3	Room: Fiesta 8-10

Conference 7961

SESSION 9
Room: Fiesta 5 . . Tues. 10:10 am to 12:10 pm

Tomosynthesis II

Session Chairs: **Despina Kontos,** The Univ. of Pennsylvania Health System; **Anders Tingberg,** Skåne Univ. Hospital, Malmö (Sweden)

10:10 am: **3D task-based performance assessment metrics for optimization of performance and dose in breast tomosynthesis**, Samuel Richard, Ehsan Samei, Duke Univ. (USA). . . . . [7961-45]

10:30 am: **Dose and diagnostic image quality in digital tomosynthesis imaging of facial bones in pediatrics**, Jenna King, CancerCare Manitoba (Canada); Susannah Hickling, The Univ. of Western Ontario (Canada) and CancerCare Manitoba (Canada); Idris A. Elbakri, CancerCare Manitoba (Canada) and Univ. of Manitoba (Canada); Martin H. Reed M.D., Jens Wrogemann, The Children's Hospital of Winnipeg (Canada) . . . . [7961-46]

10:50 am: **A 3D linear system model for the optimization of dual energy contrast enhanced digital breast tomosynthesis**, Yue-Houng Hu, Wei Zhao, Stony Brook Univ. (USA) . . . . [7961-47]

11:10 am: **Effects of image lag and scatter for dual-energy contrast-enhanced digital breast tomosynthesis using a CsI flat-panel based system**, Ann-Katherine Carton, Sylvie Puong, Razvan Iordache, Serge Muller, GE Healthcare France (France) . . . . [7961-48]

11:30 am: **Investigation of the effect of tube motion in breast tomosynthesis: Continuous or step and shoot?**, Eman Shaheen, Nicholas W. Marshall, Hilde Bosmans, Katholieke Univ. Leuven (Belgium) . . . . [7961-49]

11:50 am: **Real-time scanning beam digital x-ray image guidance system for transbronchial needle biopsy**, Sungwon Yoon, Stanford Univ. School of Medicine (USA); Brian P. Wilfley, Triple Ring Technologies, Inc. (USA); Keith Jasperson, superDimension, Inc. (USA); Ganesh Krishna, Palo Alto Medical Foundation (USA); Rebecca Fahrig, Stanford Univ. School of Medicine (USA) . . . . [7961-50]

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

Conference 7962

SESSION 5
Room: Fiesta 6 . . Tues. 10:10 am to 12:10 pm

Brain Structure and DTI

Session Chair: **Vincent A. Magnotta,** The Univ. of Iowa Hospitals and Clinics

10:10 am: **Identifying intrasulcal medial surfaces for anatomically consistent reconstruction of the cerebral cortex**, Sergey Osechinskiy, Frithjof Kruggel, Univ. of California, Irvine (USA) . . . . [7962-22]

10:30 am: **Detection and mapping of delays in early cortical folding derived from in utero MRI**, Piotr A. Habas, Vidya Rajagopalan, Julia A. Scott, Kio Kim, Univ. of California, San Francisco (USA); Ahmad Roosta, Univ. of California, Berkeley (USA); Francois Rousseau, Univ. de Strasbourg (France); A. James Barkovich, Orit A. Glenn, Colin Studholme, Univ. of California, San Francisco (USA) . . . . [7962-23]

10:50 am: **Topologically correct cortical segmentation using Khalimsky's cubic complex framework**, Manuel J. Cardoso, Matthew J. Clarkson, Gerard R. Ridgway, Marc Modat, Univ. College London (UK); Hugues Talbot, Michel Couprie, Groupe ESIEE (France); Sébastien Ourselin, Univ. College London (UK) . . . . [7962-24]

11:10 am: **A novel Riemannian metric for analyzing HARDI data**, Sentibaleng Ncube, Anuj Srivastava, The Florida State Univ. (USA) . . . . [7962-25]

11:30 am: **Resolving complex fibre configurations using two-tensor random-walk stochastic algorithms**, Nagulan Ratnarajah, Univ. of Kent (UK); Andy Simmons, King's College London (UK); Alan Colchester, Ali Hojjatoleslami, Univ. of Kent (UK) [7962-26]

11:50 am: **Efficient, graph-based white matter connectivity from orientation distribution functions via multi-directional graph propagation**, Alexis Boucharin, Ipek Oguz, The Univ. of North Carolina at Chapel Hill School of Medicine (USA); Clement Vachet, The Univ. of North Carolina at Chapel Hill (USA); Yundi Shi, The Univ. of North Carolina at Chapel Hill School of Medicine (USA); Mar Sanchez, Emory Univ. (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill School of Medicine (USA) . . . . [7962-27]

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

Conference 7963

SESSION 2
Room: Fiesta 1-3. Tues. 10:10 am to 12:10 pm

Breast Imaging I

Session Chair: **Georgia D. Tourassi,** Duke Univ.

10:10 am: **Spectral embedding based active contour (SEAC): application to breast lesion segmentation on DCE-MRI**, Shannon C. Agner, Jun Xu, Rutgers, The State Univ. of New Jersey (USA); Mark A. Rosen, The Univ. of Pennsylvania Health System (USA); Sudha Karthigeyan, Rutgers, The State Univ. of New Jersey (USA); Sarah Englander, The Univ. of Pennsylvania Health System (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . .[7963-04]

10:30 am: **Estimating corresponding locations in ipsilateral breast tomosynthesis views**, Guido van Schie, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Christine Tanner, ETH Zurich (Switzerland); Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . [7963-05]

10:50 am: **Automatic breast density segmentation: an integration of different approaches**, Michiel G. Kallenberg, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Mariëtte A. J. M. Lokate, Carla H. van Gils, Univ. Medical Ctr. Utrecht (Netherlands); Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . .[7963-06]

11:10 am: **Detection of architectural distortion in prior mammograms using measures of angular distribution**, Rangaraj M. Rangayyan, Shantanu Banik, Joseph Edward L. Desautels, Univ. of Calgary (Canada). . . . . [7963-07]

11:30 am: **Fully automated segmentation of the pectoralis muscle boundary in breast MR images**, Lei Wang, Fraunhofer MEVIS (Germany); Konstantinos Filippatos, MeVis Medical Solutions AG (Germany); Ola Friman, Horst K. Hahn, Fraunhofer MEVIS (Germany) . . . . [7963-08]

11:50 am: **Multi-view information fusion for automatic BI-RADS description of mammographic masses**, Fabián R. Narvaez, Gloria M. Díaz, Eduardo Romero Castro M.D., Univ. Nacional de Colombia (Colombia) . . . . [7963-09]

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

Conference 7964

SESSION 9
Room: Monterey 1-3 Tues. 10:10 am to 12:10 pm

Endoscopy and Laparoscopy

Session Chairs: **William E. Higgins,** The Pennsylvania State Univ.; **Lena Maier-Hein,** Deutsches Krebsforschungszentrum (Germany)

10:10 am: **Real-time surface reconstruction from stereo endoscopic images for intraoperative registration**, Sebastian Röhl, Stefanie Speidel, Sebastian Bodenstedt, Stefan Suwelack, Karlsruher Institut für Technologie (Germany); Hannes Kenngott, Ruprecht-Karls-Univ. Heidelberg (Germany); Beat-Peter Mueller-Stich, Heidelberg School of Medicine (Germany); Rüdiger Dillmann, Karlsruher Institut für Technologie (Germany) . . . . [7964-39]

10:30 am: **3D surface reconstruction for laparoscopic computer-assisted interventions: comparison of state-of-the-art methods**, Anja Groch, Deutsches Krebsforschungszentrum (Germany); Sarah Hempel, Kurt Höller, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Stefanie Speidel, Karlsruher Institut für Technologie (Germany); Rainer Engelbrecht, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Jochen Penne, PMDTechnologies GmbH (Germany); Alexander Seitel, Deutsches Krebsforschungszentrum (Germany); Sebastian Röhl, Karlsruher Institut für Technologie (Germany); Sven Mersmann, Deutsches Krebsforschungszentrum (Germany); Sebastian Bodenstedt, Karlsruher Institut für Technologie (Germany); Felix Pflaum, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Kwong Yung, Deutsches Krebsforschungszentrum (Germany); Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Hans-Peter Meinzer, Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany). . . . . [7964-40]

10:50 am: **A real-time online video overlay navigation system for minimally invasive laparoscopic tumor resection**, Matthias Keil, Matthias Noll, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany) . . . . [7964-41]

11:10 am: **Constructing spherical panoramas of a bladder phantom from endoscopic video using bundle adjustment**, Timothy D. Soper, John E. Chandler, Michael P. Porter, Eric J. Seibel, Univ. of Washington (USA) . . . . . . [7964-42]

11:30 am: **Comparison of two navigation system designs for flexible endoscopes using abdominal 3D ultrasound**, Johann B. Hummel, Marcus Kaar, Rainer Hoffmann, Christoph Bloch, Wolfgang Birkfellner, Michael Figl, Medizinische Univ. Wien (Austria) . . . . [7964-43]

Conference 7965

SESSION 9
Room: Fiesta 8-10. . . . . Tues. 10:10 am to 12:10 pm

Optical Imaging II

Session Chairs: **Yu Chen,** Univ. of Maryland, College Park; **Andreas H. Hielscher,** Columbia Univ.

10:10 am: **Seeing the focus of epilepsy through a hyperspectral camera during neurosurgery**, Herke Jan Noordmans, Rowland de Roode, Cyrille Ferrier M.D., Frans Leijten M.D., Peter C. van Rijen M.D., Peter Gosselaar M.D., Univ. Medical Ctr. Utrecht (Netherlands); Rudolf M. Verdaasdonk, Vrije Univ. Medical Ctr. (Netherlands) . . . . [7965-44]

10:30 am: **A unified approach for high throughput analysis of real-time biomolecular interactions in surface plasmon resonance and fluorescence imaging**, Catalin Fetita, Nicolas François, Françoise J. Prêteux, TELECOM & Management SudParis (France); Delacroix Hervé, Univ. Paris-Sud 11 (France) [7965-45]

10:50 am: **Preparation of near-infrared-labeled targeted contrast agents for clinical translation**, D. Michael Olive, LI-COR Biosciences (USA) . . . . [7965-46]

11:10 am: **A fast reconstruction method for fluorescence molecular tomography based on improved iterated shrinkage**, Dong Han, Jie Tian, Chenghu Qin, Institute of Automation (China); Bo Zhang, Northeastern Univ. (China); Kai Liu, Xibo Ma, Institute of Automation (China) . . . [7965-47]

11:30 am: **A novel method for eliminating autofluorescence of small animals in fluorescence molecular imaging**, Zhenwen Xue, Jie Tian, Sr., Dong Han, Xibo Ma, Institute of Automation (China) . . . [7965-48]

11:50 am: **Quantitative analysis of tumor matrix patterns through statistical and topological texture features**, Mahesh B. Nagarajan, Xiaoxing Han, Markus B. Huber, Thomas H. Foster, Edward B. Brown, Axel Wismueller, Univ. of Rochester Medical Ctr. (USA) . . . . [7965-49]

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

11:50 am: **Evaluation of electronic biopsy for clinical diagnosis in virtual colonoscopy,** Joseph Marino, Wei Du, Matthew Barish, Ellen Li, Wei Zhu, Arie Kaufman, Stony Brook Univ. (USA) [7964-44]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 10
Room: Fiesta 5 . . . . Tues. 1:20 to 3:00 pm

X-ray Imaging: Phase Contrast, Diffraction

Session Chairs: **Jeffrey H. Siewerdsen,** The Johns Hopkins Univ.; **Taly Gilat Schmidt,** Marquette Univ.

1:20 pm: **Towards differential x-ray phase contrast imaging on a compact setup,** Thomas Thuering, Paul Scherrer Institut (Switzerland) and ETH Zurich (Switzerland); Peter Modregger, Bernd Pinzer, Paul Scherrer Institut (Switzerland); Simon Rutishauser, Paul Scherrer Institut (Switzerland) and ETH Zurich (Switzerland); Christian David, Paul Scherrer Institut (Switzerland); Thomas Grund, Johannes Kenntner, Karlsruher Institut für Technologie (Germany); Marco Stampanoni, Paul Scherrer Institut (Switzerland) and ETH Zurich (Switzerland). . . . . [7961-51]

1:40 pm: **Beam hardening in x-ray differential phase contrast computed tomography,** Nicholas B. Bevins, Joseph N. Zambelli, Ke Li, Zhihua Qi, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA). . . . . [7961-52]

2:00 pm: **Field of view doubling in differential phase contrast computed tomography,** Zhihua Qi, Joseph N. Zambelli, Nicholas B. Bevins, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA). . . . . [7961-53]

2:20 pm: **Spectroscopic measurements concerning grating-based x-ray phase-contrast imaging,** Thomas Weber, Peter Bartl, Florian L. Bayer, Jürgen Durst, Wilhelm Haas, Thilo Michel, Georg Pelzer, André Ritter, Gisela Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany). [7961-54]

2:40 pm: **3D diffraction tomography for visualization of contrast media,** Vinay M. Pai, Ashley Stein, Ashvin George, Rael Kopace, Eric Bennett, Julie Auxier, Han Wen, NHLBI, National Institutes of Health (USA). . . . . [7961-55]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 6
Room: Fiesta 6 . . . . . . Tues. 1:20 to 3:00 pm

Registration I

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

1:20 pm: **Landmark-driven parameter optimization for non-linear image registration,** Alexander Schmidt-Richberg, René Werner, Jan Ehrhardt, Jan-Christoph Wolf, Heinz Handels, Univ. zu Lübeck (Germany) . . . . [7962-28]

1:40 pm: **Temporal subtraction of chest radiographs compensating pose differences,** Jens von Berg, Philips Research (Germany); Jalda Dworzak, Konrad-Zuse-Zentrum für Informationstechnik Berlin (Germany); Tobias Klinder, Philips Research (Germany); Dirk Manke, Philips Healthcare (Germany); Hans Lamecker, Stefan Zachow, Konrad-Zuse-Zentrum für Informationstechnik Berlin (Germany); Cristian Lorenz, Philips Research (Germany) . . . . [7962-29]

2:00 pm: **An accurate 3D shape context based non-rigid registration method for mouse whole-body skeleton registration,** Di Xiao, Commonwealth Scientific and Industrial Research Organisation (Australia); David Zahra, Australian Nuclear Science and Technology Organisation (Australia); Pierrick T. Bourgeat, Commonwealth Scientific and Industrial Research Organisation (Australia); Paula Berghofer, Australian Nuclear Science and Technology Organisation (Australia); Oscar Acosta Tamayo, Univ. de Rennes 1 (France); Marie Gregoire, Australian Nuclear Science and Technology Organisation (Australia); Olivier Salvado, Commonwealth Scientific and Industrial Research Organisation (Australia). . . . . [7962-30]

2:20 pm: **Iterative closest point algorithm with anisotropic weighting and its application to fine surface registration,** Lena Maier-Hein, Thiago R. dos Santos, Alfred Franz, Hans-Peter Meinzer, German Cancer Research Ctr. (Germany); J. Michael Fitzpatrick, Vanderbilt Univ. (USA) [7962-31]

2:40 pm: **Incorporating hard constraints into non-rigid registration via nonlinear programming,** Duy V. N. Luong, Daniel Rueckert, Berc Rustem, Imperial College London (UK) . . . . [7962-32]

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 3
Room: Fiesta 1-3. . . . . Tues. 1:20 to 3:00 pm

Lung Nodules

Session Chair: **Susan Astley,** The Univ. of Manchester (UK)

1:20 pm: **A CAD system for automatic detection and identification of solitary pulmonary nodules on follow-up CT scans based on local intensity structure analysis and non-rigid image registration,** Bin Chen, Hideto Naito, Yoshihiko Nakamura, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Hirotoshi Honma, Sapporo Medical Univ. (Japan); Hirotsugu Takabatake, Minami Sanjo Hospital (Japan); Masaki Mori, Sapporo Kosei Hospital (Japan); Hiroshi Natori, Keiwakai Nishioka Hospital (Japan); Daniel Rueckert, Imperial College London (UK); Kensaku Mori, Nagoya Univ. (Japan) . . . . [7963-10]

1:40 pm: **Improved computerized detection of lung nodules in chest radiographs by means of 'virtual dual-energy' radiography,** Sheng Chen, Kenji Suzuki, Heber MacMahon, The Univ. of Chicago Medical Ctr. (USA) . . . . . [7963-11]

2:00 pm: **Evaluation of 1D, 2D and 3D nodule size estimation by radiologists for spherical and nonspherical nodules through CT thoracic phantom imaging,** Nicholas A. Petrick, U.S. Food and Drug Administration (USA); Hyun Grace Kim, Univ. of California, Los Angeles (USA); David A. Clunie, Kristin Borradaile, RadPharm, Inc. (USA); Robert R. Ford, Princeton Radiology Associates (USA); Rongping Zeng, Marios A. Gavrielides, U.S. Food and Drug Administration (USA); Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA); Charles P. Fenimore, John Lu, National Institute of Standards and Technology (USA); Binsheng Zhao, Columbia Univ. Medical Ctr. (USA); Andrew J. Buckler, Buckler Biomedical LLC (USA) . . . . [7963-12]

2:20 pm: **Automatic lung nodule detection in thick slice CT: a comparative study of different gating schemes in CAD,** Pandu R. Devarakota, Dinesh M. Siddu, Pragnya Maduskar, Siddharth Vikal, Laks Raghupathi, Siemens Information Systems Ltd. (India); Marcos Salganicoff, Siemens Medical Solutions USA, Inc. (USA) . . . . [7963-13]

2:40 pm: **Temporal subtraction of 'virtual dual-energy' chest radiographs for improved conspicuity of growing cancers and other pathologic changes,** Kenji Suzuki, Samuel G. Armato III, Roger M. Engelmann, Philip Caligiuri, Heber MacMahon, The Univ. of Chicago (USA) . . . . [7963-14]

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

Conference 7964 continued
Visualization, Image-guided Procedures and Modeling
Room: Monterey 1-3

SESSION 10
Room: Monterey 1-3. . . Tues. 1:20 to 3:00 pm

Orthopedic and Cranial Procedures

Session Chairs: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada); **Ziv R. Yaniv,** Georgetown Univ.

1:20 pm: **Closed-form inverse kinematics for intra-operative mobile C-arm positioning with six degrees of freedom,** Lejing Wang, Technische Univ. München (Germany); Ekkehard Euler, Ludwig-Maximilians-Univ. München (Germany); Darius Burschka, Nassir Navab, Technische Univ. München (Germany). . . . . . . [7964-45]

1:40 pm: **Spectral-based 2D/3D x-ray to CT image rigid registration,** Moti Freiman, Ofir Pele, Aviv Hurvitz, Michael Werman, Leo Joskowicz, The Hebrew Univ. of Jerusalem (Israel). . . . . [7964-46]

2:00 pm: **Intra-temporal facial nerve centerline segmentation for navigated temporal bone surgery,** Eduard H. Voormolen, Marijn van Stralen, Peter Woerdeman, Josien P. W. Pluim, Herke J. Noordmans, Jan W. Berkelbach van der Sprenkel, Luca Regli, Max Viergever, Univ. Medical Ctr. Utrecht (Netherlands) [7964-47]

2:20 pm: **Optimization of multi-image pose recovery of fluoroscope tracking (FTRAC) fiducial in an image-guided femoroplasty system,** Wen P. Liu, Armand Mehran, Yoshito Otake, Russell H. Taylor, The Johns Hopkins Univ. (USA) . . [7964-78]

2:40 pm: **Insertion of electrode array using percutaneous cochlear implantation technique: a cadaveric study,** Ramya Balachandran, Vanderbilt Univ. Medical Ctr. (USA); Jason E. Mitchell, Jack H. Noble, Daniel Schurzig, Grégoire Blachon, Vanderbilt Univ. (USA); Theodore R. McRackan, Vanderbilt Univ. Medical Ctr. (USA); Robert J. Webster III, Benoit M. Dawant, J. Michael Fitzpatrick, Vanderbilt Univ. (USA); Robert F. Labadie, Vanderbilt Univ. Medical Ctr. (USA) . . . . [7964-49]

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

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

SESSION 10
Room: Fiesta 8-10. . . . . Tues. 1:20 to 3:00 pm

Vascular Imaging

Session Chair: **Juan R. Cebral,** George Mason Univ.

1:20 pm: **Time evolution and hemodynamics of cerebral aneurysms,** Daniel Sforza, George Mason Univ. (USA); Christopher M. Putman, Inova Fairfax Hospital (USA); Satoshi Tateshima, Fernando Vinuela, The Ronald Reagan UCLA Medical Ctr. (USA); Juan R. Cebral, George Mason Univ. (USA) . . . . . . [7965-50]

1:40 pm: **Study of stent deployment mechanics using a high-resolution x-ray imaging detector,** Weiyuan Wang, Ciprian N. Ionita, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) . . . . [7965-51]

2:00 pm: **Angiographic imaging evaluation of patient-specific bifurcation-aneurysm phantom treatment with pre-shaped, self-expanding, flow-diverting stents: feasibility study,** Ciprian N. Ionita, Himansu Suri, Sabareesh Nataranjian, Adnan Siddiqui, Elad Levy, L. Nelson Hopkins M.D., Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (USA) . . . . [7965-52]

2:20 pm: **Comparison of models and acquisition techniques for estimation of myocardial blood flow from CT,** Adam M. Alessio, Kelley R. Branch, James H. Caldwell, Univ. of Washington Medical Ctr. (USA); James B. Bassingthwaighte M.D., Univ. of Washington (USA) . . . . . [7965-53]

2:40 pm: **Developing a tool for the validation of quantitative DCE-MRI,** Karin Bol, Joost C. Haeck, Lejla Alic, Monique Bernsen, Marion de Jong, Wiro J. Niessen, Jifke F. Veenland, Erasmus MC (Netherlands) . . . . [7965-54]

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

Conference 7961 continued **Physics of Medical Imaging** Room: Fiesta 5	Conference 7962 continued **Image Processing** Room: Fiesta 6	Conference 7963 continued **Computer-Aided Diagnosis** Room: Fiesta 1-3	Conference 7964 continued **Visualization, Image-guided Procedures and Modeling** Room: Monterey 1-3	Conference 7965 continued **Biomedical Applications in Molecular, Structural, and Functional Imaging** Room: Fiesta 8-10

SESSION 11 (7961)

Room: Fiesta 5 . . . . . . Tues. 3:30 to 5:30 pm

Image Reconstruction

Session Chairs: **Bruce R. Whiting,** Washington Univ. in St. Louis; **Katsuyuki Taguchi,** The Johns Hopkins Outpatient Ctr.

3:30 pm: **Penalized-likelihood reconstruction for sparse data acquisitions with unregistered prior images and compressed sensing penalties**, Joseph W. Stayman, Wojtek Zbijewski, Yoshito Otake, Sebastian Schafer, Junghoon Lee, Jerry L. Prince, Jeffrey H. Siewerdsen, The Johns Hopkins Univ. (USA) . . . . [7961-56]

3:50 pm: **Quantification of temporal resolution and its reliability in the context of TRI-PICCS and dual source CT**, Clemens Maass, Marc Kachelriess, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . [7961-57]

4:10 pm: **Evaluation of a novel CT image reconstruction algorithm with enhanced temporal resolution**, Harald Schoendube, Thomas Allmendinger, Karl Stierstorfer, Herbert K. Bruder, Thomas Flohr, Siemens AG (Germany) . . . . [7961-58]

4:30 pm: **A Compton imaging algorithm for on-line monitoring in hadron therapy**, John E. Gillam, Carlos Lacasta, Cristian Candela Juan, Gabriela Llosa, John Barrio, Magdalena Rafecas, Instituto de Física Corpuscular, Univ. de València (Spain) . . . . [7961-59]

4:50 pm: **Method for reducing windmill artifacts in multislice CT images**, Kevin M. Brown, Stanislav Zabic, Philips Healthcare (USA) . . . . [7961-60]

5:10 pm: **Helical x-ray differential phase contrast computed tomography**, Zhihua Qi, Pascal Theriault Lauzier, Nicholas B. Bevins, Joseph N. Zambelli, Ke Li, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . [7961-61]

SESSION 7 (7962)

Room: Fiesta 6 . . . . . . Tues. 3:30 to 5:30 pm

Shape Methods and Applications

Session Chair: **Sébastien Ourselin,** Univ. College London (UK)

3:30 pm: **Mapping the distance between brain and endocast and their asymmetries**, Marc Fournier, Benoît Combès, Sylvain Prima, IRISA / INRIA Rennes (France). . . . . [7962-33]

3:50 pm: **Mandible shape modeling using the second eigenfunction of the Laplace-Beltrami operator**, Seongho Seo, Seoul National Univ. Hospital (Korea, Republic of); Moo K. Chung, Univ. of Wisconsin-Madison (USA) and Seoul National Univ. Hospital (Korea, Republic of); Houri K. Vorperian, Univ. of Wisconsin-Madison (USA) [7962-34]

4:10 pm: **Manifold learning for image-based breathing gating in MRI**, Mehmet Yigitsoy, Christian Wachinger, Nassir Navab, Technische Univ. München (Germany) . . . . [7962-35]

4:30 pm: **Active shape models unleashed**, Matthias Kirschner, Stefan Wesarg, Technische Univ. Darmstadt (Germany) . . . . [7962-36]

4:50 pm: **Automatic shape based deformable registration of multiphase contrast enhanced liver CT volumes**, Marius Erdt, Fraunhofer-Institut für Graphische Datenverarbeitung (Germany); Georgios Sakas, Technische Univ. Darmstadt (Germany); Matthias Hammon, Universitätsklinikum Erlangen (Germany); Stefano De Beni, Esaote S.p.A (Italy); Luigi Solbiati, General Hospital of Busto Arsizio (Italy); Alexander Cavallaro, Universitätsklinikum Erlangen (Germany) . . . . [7962-37]

5:10 pm: **Real-time cardiac surface tracking from sparse samples using subspace clustering and maximum-likelihood linear regressors,** Vimal Singh, Ahmed H. Tewfik, Univ. of Texas, Austin (USA) . . . . [7962-38]

SESSION 4 (7963)

Room: Fiesta 1-3. . . . . Tues. 3:30 to 5:30 pm

Vascular and Cardiac

Session Chair: **Carol L. Novak,** Siemens Corporate Research

3:30 pm: **Segmentation of the lumen and media-adventitia boundaries of the common carotid artery from 3D ultrasound images**, Eranga Ukwatta, Joseph Awad, Aaron D. Ward, Robarts Research Institute (Canada); Jagath K. Samarabandu, The Univ. of Western Ontario (Canada); Adam Krasinski, Grace Parraga, Aaron Fenster, Robarts Research Institute (Canada) . . . . [7963-15]

3:50 pm: **Feature extraction and wall motion classification of 2D stress echocardiography with support vector machines**, Kiryl Chykeyuk, David A. Clifton, J. Alison Noble, Univ. of Oxford (UK) . . . . [7963-16]

4:10 pm: **Automated method for the identification and analysis of vascular tree structures in retinal vessel network**, Vinayak S. Joshi, Mona K. Garvin, Joseph M. Reinhardt, Michael D. Abramoff, The Univ. of Iowa (USA) . . . . [7963-17]

4:30 pm: **Robust and fast abdominal aortic aneurysm centerline detection for rupture risk prediction**, Hong Zhang, Ender A. Finol, Carnegie Mellon Univ. (USA) . . . . [7963-18]

4:50 pm: **Machine learning based automatic detection of pulmonary trunk**, Hong Wu, Kun Deng, Jianming Liang, Arizona State Univ. (USA) . . . . . . [7963-19]

5:10 pm: **Computerized detection of pulmonary embolism in computed tomographic pulmonary angiography (CTPA): improvement of vessel segmentation**, Chuan Zhou, Heang-Ping Chan, Jean W. Kuriakose, Aamer Chughtai, Lubomir M. Hadjiiski, Jun Wei, Smita Patel, Ella A. Kazerooni, Univ. of Michigan Health System (USA) . . . .[7963-20]]

SESSION 11 (7964)

Room: Monterey 1-3. . . Tues. 3:30 to 5:30 pm

Image Guided Therapy II

Session Chairs: **Wolfgang Birkfellner,** Medizinische Univ. Wien (Austria); **Michael I. Miga,** Vanderbilt Univ.

3:30 pm: **Single camera closed-form real-time needle trajectory tracking for ultrasound**, Mohammad Najafi, Robert N. Rohling, The Univ. of British Columbia (Canada) . . . . [7964-50]

3:50 pm: **Feature-based US to CT registration of the aortic root**, Pencilla Lang, The Univ. of Western Ontario (Canada); Elvis C. S. Chen, Gerard M. Guiraudon, Robarts Research Institute (Canada); Doug L. Jones, Daniel Bainbridge, London Health Sciences Ctr. (Canada); Maria Drangova, Robarts Research Institute (Canada); Michael W. Chu, The Univ. of Western Ontario (Canada); Noby Hata, Brigham and Women's Hospital (USA); Ameet Jain, Philips Research North America (USA); Terry Peters, Robarts Research Institute (Canada) . . . . [7964-51]

4:10 pm: **Improved validation platform for ultrasound-based monitoring of thermal ablation**, Hamed Peikari, Andras Lasso, Gabor Fichtinger, Queen's Univ. (Canada) . . . . [7964-52]

4:30 pm: **Toward robotic needle steering in lung biopsy: a tendon-actuated approach**, Louis B. Kratchman, Mohammed M. Rahman, Justin R. Saunders, James T. Steier, Robert J. Webster III, Vanderbilt Univ. (USA) . . . . [7964-53]

4:50 pm: **Visualization of motion fields and critical point estimation: determining condence metrics for 4D PET registration**, Rhushabh Bhandari, Girish Gopalakrishnan, GE Global Research (India); Kris Thielemans, Hammersmith Imanet Ltd. (UK); Arunabha Roy, GE Global Research (India). . . . . [7964-54]

SESSION 11 (7965)

Room: Fiesta 8-10. . . . . Tues. 3:30 to 5:30 pm

Chest: Lung and Cardiac

Session Chairs: **Anne Clough,** Marquette Univ.; **Amir A. Amini,** Univ. of Louisville

3:30 pm: **The effect of PSF spatial-variance and nonlinear transducer geometry on motion estimation from echocardiography**, Vahid Tavakoli, Amir A. Amini, Univ. of Louisville (USA) . . . . [7965-55]

3:50 pm: **Carbon nanotube based respiratory gated micro-CT imaging of a murine model of lung tumors with optical imaging correlation**, Laurel M. Burk, Samuel Heathcote, The Univ. of North Carolina at Chapel Hill (USA); Ko-Han Wang, Yueh Z. Lee, The Univ. of North Carolina School of Medicine (USA); William Y. Kim, Otto Zhou, The Univ. of North Carolina at Chapel Hill (USA) . . . . [7965-56]

4:10 pm: **A fully automated method for segmenting lung airway wall area measurements from bronchoscopic Optical Coherence Tomography images**, Mohammadreza Heydarian, Stephen Choy, Andrew Wheatley, Robarts Research Institute (Canada); Stephen Lam M.D., The Univ. of British Colombia (Canada); Harvey Coxson, Vancouver General Hospital (Canada); David G. McCormack M.D., The Univ. of Western Ontario (Canada); Grace Parraga, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada). . . . . . . [7965-57]

4:30 pm: **Imaging of myocardial infarction using carbon nanotube micro-computed tomography and delayed contrast enhancement**, Laurel M. Burk, The Univ. of North Carolina at Chapel Hill (USA); Ko-Han Wang, Eunice Kang, Mauricio Rojas, Monte Willis M.D., The Univ. of North Carolina School of Medicine (USA); Otto Zhou, The Univ. of North Carolina at Charlotte (USA); Yueh Z. Lee, The Univ. of North Carolina School of Medicine (USA) . . . . [7965-58]

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5:10 pm: **Implementation of an interactive liver surgery planning system**, Luyao Wang, Jingjing Liu, Rong Yuan, Shuguo Gu, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China); Long Yu, Zhitao Li, Yanzhao Li, Zhen Li, Huazhong Univ. of Science and Technology (China); Qingguo Xie, Wuhan National Lab. for Optoelectronics (China) and Huazhong Univ. of Science and Technology (China); Daoyu Hu, Huazhong Univ. of Science and Technology (China) . . . . [7964-55]

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4:50 pm: **Automated pulmonary ventilation imaging (APVI) for children using Xe-133 scintigraphy**, Xinhua Cao, S. Ted Treves, Children's Hospital Boston (USA) . . . . [7965-66]

5:10 pm: **Human pulmonary acinar airspace segmentation from three-dimensional synchrotron radiation micro CT images of the secondary pulmonary lobule**, Yoshiki Kawata, Takuya Hosokawa, Noboru Niki, Univ. of Tokushima (Japan); Keiji Umetani, Japan Synchrotron Radiation Research Institute (Japan); Yasutaka Nakano, Shiga Univ. of Medical Science (Japan); Hironobu Ohmatsu, Noriyuki Moriyama M.D., National Cancer Ctr. Hospital East (Japan); Harumi Itoh, Univ. of Fukui (Japan) . . . . [7965-60]

WORKSHOP
Academic-Industrial Collaborations: What works, what doesn't work?
Fiesta 6 Room
Tues. 5:45 to 7:45 pm
David R. Haynor,
Univ. of Washington
For details see page 9.

DEMO WORKSHOP
CAD Demonstrations
Veracruz C Room
Tues. 5:45 to 7:45 pm
Stephen Aylward, Kitware, Inc. (USA)
Heang-Ping Chan,
Univ. of Michigan Health System (USA)
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WORKSHOP
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Monterey 1-3 Room
Tues. 5:30 to 7:45 pm
Claudia R. Mello-Thoms,
Univ. of Pittsburgh Cancer Institute (USA)
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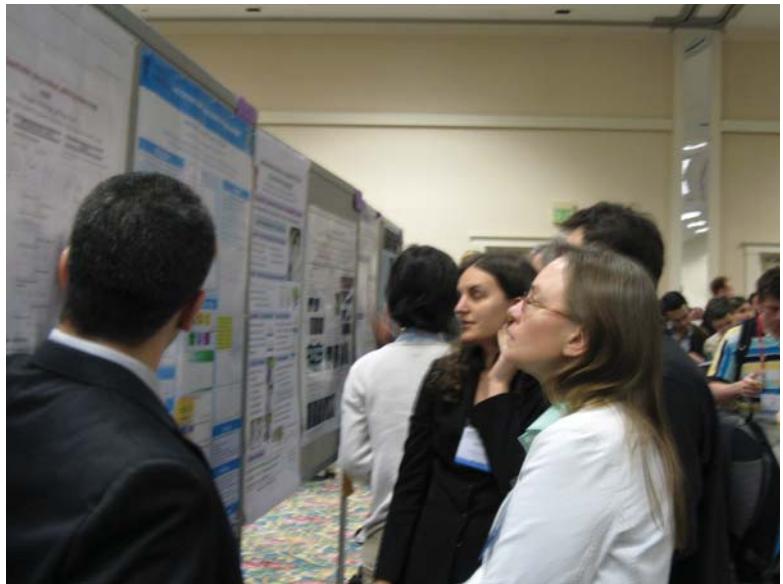
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Conference 7961 Posters
Physics of Medical Imaging

CT

Iterative CT reconstruction integrating SART and conjugate gradient, Yongsheng Pan, Ross Whitaker, The Univ. of Utah (USA) . . . . [7961-93]

Iterative helical cone-beam CT reconstruction using graphics hardware: a simulation study, Yongsheng Pan, Ross Whitaker, The Univ. of Utah (USA) [7961-94]

Iterative image reconstruction for helical cone-beam x-ray CT using a stored system matrix approach, Jingyan Xu, Benjamin M. Tsui, The Johns Hopkins Univ. (USA) . . . . [7961-95]

Accelerate multidimensional CT scanner simulation with GPU, Yingjie Han, Jiangtao Gao, Hitachi (China) Research & Development Corp. (China); Osamu Miyazaki, Hitachi Medical Corp. (Japan). . . . . [7961-96]

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Ring artifact corrections in flat-panel-detector based cone beam CT, Soo Yeol Lee, Jae Gon Kim, Kyung Hee Univ. (Korea, Republic of); Md. Kamrul Hasan, Bangladesh Univ. of Engineering and Technology (Bangladesh) and Kyung Hee Univ. (Korea, Republic of) . . . . [7961-99]

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A contrast adaptive total p-norm variation minimization approach to CT reconstruction for artifact reduction of reduced view perfusion CT imaging, Chang-Won Kim, Jong-Hyo Kim, Seoul National Univ. Hospital (Korea, Republic of) . . . . [7961-103]

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A study on regularization parameter choice for interior tomography based on truncated Hilbert transform, Junfeng Wu, Xuanqin Mou, Shaojie Tang, Xi'an Jiaotong Univ. (China) . . . . [7961-107]

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Low-dose dual-energy cone-beam CT using a total-variation minimization algorithm, Jonghwan Min, KAIST (Korea, Republic of) and Nano Focus Ray Inc. (Korea, Republic of); Kyong-Woo Kim, Nano Focus Ray Inc. (Korea, Republic of); Gyuseong Cho, Seungryong Cho, KAIST (Korea, Republic of). . . . . [7961-110]

Refinement of motion correction strategies for lower-cost CT for the developing world, Jered R. Wells, W. Paul Segars, Christopher J. Kigongo, James T. Dobbins III, Duke Univ. (USA) . . . [7961-111]

Accelerating statistical image reconstruction algorithms for fan-beam x-ray CT using cloud computing, Somesh Srivastava, Vadim Sheinin, IBM Thomas J. Watson Research Ctr. (USA) . . . . [7961-112]

Quantitative evaluation method of noise texture for iteratively reconstructed x-ray CT images, Pascal Theriault Lauzier, Jie Tang, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA). . . . . [7961-113]

An efficient scatter correction method based on pre-reconstructed images of contrast enhancement and sparse-viewed Monte Carlo simulation, Hao Yan, Xuanqin Mou, Xi'an Jiaotong Univ. (China) . . . . [7961-114]

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Data-driven pose correction for cone-beam CT with analytic and iterative reconstruction methods, Yongsheng Pan, Joshua Cates, Ross Whitaker, The Univ. of Utah (USA). . . . . [7961-117]

A simple image based method for obtaining electron density and atomic number in dual energy CT, Timothy P. Szczykutowicz, Zhihua Qi, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . [7961-118]

A scatter artifact reduction technique in dual-energy computed tomography systems, Jiahua Fan, Naveen Chandra, Jiang Hsieh, GE Healthcare (USA)[7961-119]

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Dosimetric quality control of Eclipse treatment planning system using pelvic and thoracic digital test objects, Yassine Y. Ben Hdech, QualiFormeD SARL (France) and IRCCyN (France); Stéphane S. Beaumont, QualiFormeD SARL (France); Jean-Pierre V. Guédon, IRCCyN (France) and Univ. de Nantes (France); Sylvain S. Crespin, Ctr. Hospitalier Départemental (France) . . . . [7961-123]

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Segmentation of knee injuries swelling on infrared images, John Puentes, Helene Langet, TELECOM Bretagne (France); Christophe L. Herry, Hôpital Rivière-des-Prairies (Canada); Monique Frize, Carleton Univ. (Canada). . . . . [7963-128]

Oncology

computer-aided tumor detection stemmed from the fuzzification of the Dempster-Shafer theory, Obioma Udobata, Chantal Muller, Carole Lartizien, Institut National des Sciences Appliquées de Lyon (France) . . . . [7963-129]

Analysis of transient thermal images to distinguish melanoma from dysplastic nevi, Muge Pirtini Cetingul, Hasan E. Cetingul, Cila Herman, The Johns Hopkins Univ. (USA) . . . . [7963-130]

BCC skin cancer diagnosis based on texture analysis techniques, Shao-Hui Chuang, Xiaoyan Sun, Old Dominion Univ. (USA); Wen-Yu Chang, Gwo-Shing Chen, Kaohsiung Medical Univ. (Taiwan); Adam Huang, National Central Univ. (Taiwan); Jiang Li, Frederic McKenzie, Old Dominion Univ. (USA) . . . . [7963-131]

Computer-aided diagnosis for prostate cancer detection in the peripheral zone via multisequence MRI, Emilie Niaf, Institut National des Sciences Appliquées de Lyon (France); Olivier Rouviere, INSERM (France); Carole Lartizien, Institut National des Sciences Appliquées de Lyon (France) . . . . [7963-132]

A CAD system based on multi-parametric analysis for cancer prostate detection on DCE-MRI, Simone Mazzetti, Massimo De Luca, Christian Bracco, Anna Vignati, Valentina Giannini, Michele Stasi, Filippo Russo, Enrico Armando, Institute for Cancer Research and Treatment (Italy); Silvano Agliozzo, iM3D S.p.A. Medical Imaging Lab. (Italy); Daniele Regge, Institute for Cancer Research and Treatment (Italy) . . [7963-133]

Retina

Modeling photo-bleaching kinetics to map local variations in rod rhodopsin density, Martin Ehler, National Institutes of Health (USA); Julia Dobrosotskaya, Univ. of Maryland, College Park (USA); Emily J. King, National Institutes of Health (USA); Wojciech Czaja, Univ. of Maryland, College Park (USA); Robert F. Bonner, National Institutes of Health (USA) . . . . [7963-134]

Identifying glaucoma with multi-fractal features from optical coherence tomography, Pinakin Gunvant, Southern College of Optometry (USA); Paul Y. Kim, Khan M. Iftekharuddin, The Univ. of Memphis (USA); Edward A. Essock, Univ. of Louisville (USA) . . . . [7963-135]

Feature-based glaucomatous progression prediction using scanning laser polarimetry data, Paul Y. Kim, Khan M. Iftekharuddin, The Univ. of Memphis (USA); Pinakin Gunvant, Southern College of Optometry (USA); M. Tóth, A. Garas, G. Holló, Semmelweis Univ. (Hungary); Edward A. Essock, Univ. of Louisville (USA) . . . . [7963-136]

An ensembling approach for optic cup detection based on spatial heuristic analysis in retinal fundus images, Damon W. K. Wong, Jiang Liu, Ngan-Meng Tan, Fengshou Yin, Beng Hai Lee, Jun Cheng, A*STAR Institute for Infocomm Research (Singapore); Tien Yin Wong, Singapore Eye Research Institute (Singapore) . . [7963-137]

Automatic arteriovenous crossing phenomenon detection on retinal fundus images, Yuji Hatanaka, Univ. of Shiga Prefecture (Japan); Chisako Muramatsu, Takeshi Hara, Hiroshi Fujita, Gifu Univ. (Japan) . . . . [7963-138]

Optic disk detection using vessel centerline detection on a directional match filter surface, Atif Mughees, Muhammad A. Anjum, National Univ. of Science and Technology (Pakistan) . . . . [7963-139]

Dual angle scan protocol with Doppler optical coherence tomography for retinal blood flow measurement, Ou Tan, Yimin Wang, David Huang, Doheny Eye Institute (USA) . . . . [7963-141]

Other

Continuous measurements of mandibular cortical width on dental panoramic radiographs for computer-aided diagnosis of osteoporosis, M. S. Kavitha, Akira Asano, Hiroshima Univ. (Japan); Akira Taguchi, Matsumoto Dental Univ. (Japan) . . . . [7963-143]

Automated classification and visualization of healthy and pathological dental tissues based on near-infrared hyperspectral imaging, Peter Usenik, Miran Bürmen, Tomaž Vrtovec, Ales Fidler, Franjo Pernuš, Boštjan Likar, Univ. of Ljubljana (Slovenia) . . . . [7963-145]

A two-view ultrasound CAD system for spina bifida detection using Zernike features, Umut Konur, Fikret Gürgen, Bogaziçi Üniv. (Turkey); Füsun Varol, Trakya Üniv. (Turkey) . . . . [7963-146]

Automatic measurement of early gestational sac diameters from one scan session, Ling Zhang, Zhejiang Univ. (China); Siping Chen, Shenzhen Univ. (China) . . . . [7963-147]

Conference 7966 Posters

Image Perception, Observer Performance, and Technology Assessment

Assessment of a CAD scheme in selecting the optimal focused microscopic scanning images of the metaphase chromosomes, Xingwei Wang, Jun Tan, Univ. of Pittsburgh Medical Ctr. (USA); Yuchen Qiu, Yuhua Li, Hong Liu, The Univ. of Oklahoma (USA); Shibo Li, The Univ. of Oklahoma Health Sciences Ctr. (USA); Bin Zheng, Univ. of Pittsburgh Medical Ctr. (USA) . . . . [7966-43]

Quantitative evaluation of six graph based semi-automatic liver tumor segmentation techniques using multiple sets of reference segmentation, Zihua Su, Xiang Deng, Siemens Ltd. (China); Christophe Chefd'hotel, Leo Grady, Siemens Corporate Research (USA); Jun Fei, Dong Zheng, Ning Chen, 306 Hospital of PLA (China); Xiaodong Xu, Siemens Ltd. (China) . . . . [7966-45]

Applying resonance-frequency based electrical impedance spectroscopy to assess the risk of developing thyroid cancer, Mitchell E. Tublin, Bin Zheng, Dror Lederman, Amy H. Klym, Erica D. Brown, David Gur, Univ. of Pittsburgh (USA) . . . . [7966-46]

Evaluation of agreement in corneal thickness measurements obtained using optical coherence tomography and ultrasound technique and determination of its specificity in keratoconus screening, Pinakin Gunvant, Southern College of Optometry (USA) and Univ. of Memphis (USA); Regan Darner, Southern College of Optometry (USA) . . . . [7966-47]

Fusion of classifiers for REIS-based detection of suspicious breast lesions, Dror Lederman, Xingwei Wang, Bin Zheng, Univ. of Pittsburgh Medical Ctr. (USA); Jules H. Sumkin M.D., Univ. of Pittsburgh (USA); Mitchell E. Tublin, David Gur, Univ. of Pittsburgh Medical Ctr. (USA) . . . . [7966-48]

A software tool to compare contrast-detail detection in uniform and in real mammographic backgrounds, Gabriel Prieto, Margarita Chevalier, Eduardo Guibelalde, Univ. Complutense de Madrid (Spain) . . . . [7966-49]

Comparison of the detection rates in reduced image by difference of interpolation method, Akiko Horii, Chihiro Kataoka, Daigo Yokoyama, Nagoya Univ. (Japan); Naotoshi Fujita, Nagoya Univ. School of Medicine (Japan); Naruomi Yasuda, Akihiro Sugiura, Gifu Univ. of Medical Science (Japan); Yoshie Kodera, Nagoya Univ. School of Medicine (Japan) . . . . [7966-50]

FBP and NBC: a comparison of lesion detection performance in head CT imaging, Sameer Tipnis, Diana J. Vincent, Zoran Rumboldt, Walter Huda, Medical Univ. of South Carolina (USA) . . . . [7966-51]

The effects of anatomical information and observer expertise on abnormality detection task, Lu Zhang, Christine Cavaro-Ménard, Ctr. Hospitalier Univ. de Angers (France); Patrick Le Callet, Univ. de Nantes (France); L. Cooper, Univ. of Angers (France) . . . . [7966-52]

Application of artificial neural network in simulating subjective evaluation of tumor segmentation, Dongjiao Lv, Xiang Deng, Siemens Ltd. (China) . . . . [7966-53]

Optimisation of hepatic lesion detection with computed tomography (CT): Is randomisation of lesion location necessary?, Karen L. Dobeli, The Univ. of Sydney (Australia) and Royal Brisbane and Women's Hospital (Australia); Sarah Lewis, Steven Meikle, The Univ. of Sydney (Australia); David Thiele, Queensland Health (Australia); Patrick C. Brennan, The Univ. of Sydney (Australia) . . . . [7966-54]

Impact of hybrid SPECT/CT imaging on the detection of single parathyroid adenoma, Antony Morrison, Peter L. Kench, Patrick C. Brennan, Warren Reed, Mariusz W. Pietrzyk, The Univ. of Sydney (Australia); Geoff Schembri, Elizabeth Bailey, Paul Roach, Royal North Shore Hospital (Australia); Michael Evanoff, The American Board of Radiology (USA) . . . . [7966-55]

Role of expertise and contralateral symmetry in the diagnosis of pneumoconiosis: an experimental study, Varun Jampani, International Institute of Information Technology (India); Vivek P. Vaidya, GE Global Research (India); Jayanthi Sivaswamy, International Institute of Information Technology (India); Kishore Tourani, Care Hospitals (India) . . . [7966-56]

Analysis of ARIOL's imaging conditions: contrast, brightness and resolution, Bin Dong, Beijing Univ. of Chinese Medicine (China); Wen-jian Chen, Xi'an Institute of Applied Optics (China); Wei Dong, Xi'an Technological Univ. (China) . . . . . . [7966-57]

Analysis of the number of distinct findings obtained by multiple readers in an MRMC study: When do findings obtained from the addition of new readers become redundant, or otherwise negligible?, Sophie Paquerault, Berkman Sahiner, Anna Kettermann, U.S. Food and Drug Administration (USA); Laura M. Yarusso, Consultant (USA); Lubomir M. Hadjiiski, Heang-Ping Chan, Univ. of Michigan Health System (USA) . . . [7966-58]

Analysis of the correlation between the ROIs of transrectal near infrared and transrectal ultrasound images of the prostate cancer using an observer model-based approach, Yuhao Jiang, Univ. of Central Oklahoma (USA); Daqing Piao, Oklahoma State Univ. (USA) [7966-59]

Reproducibility of an imaging based prostate cancer prognostic assay, Faisal M. Khan, Douglas Powell, Valentina Bayer-Zubek, Rui Soares, Allison Mott, Gerardo Fernandez M.D., Ricardo Mesa-Tejada, Michael J. Donovan, Aureon Biosciences, Inc. (USA). . . . . [7966-60]

Assessment of updated CAD without a new reader study: effect of calibration of computer output on the computer-aided reader performance in CADx, Weijie Chen, Nicholas A. Petrick, Berkman Sahiner, U.S. Food and Drug Administration (USA) . . . . [7966-61]

Streak artefact quantification for abdominal CT, Michael Figl, Romana Fragner, Medizinische Univ. Wien (Austria); Patrick Heimel, Fachhochschule Technikum Wien (Austria); Christian Loewe M.D., Medizinische Univ. Wien (Austria) . [7966-62]

High luminance monochrome vs color displays: impact on performance and search, Elizabeth A. Krupinski, Hans Roehrig, The Univ. of Arizona (USA); Takashi Matsui, Eizo Nanao Corp. (Japan). [7966-63]

Study of signal-to-noise ratios considered human visual characteristics, Yui Hayashi, Maki Yamada, Nagoya Univ. (Japan); Naotoshi Fujita, Nagoya Univ. Hospital (Japan); Yoshie Kodera, Nagoya Univ. School of Health Sciences (Japan). . . . . [7966-64]

Radiation dose reduction in digital radiography using wavelet-based image processing methods, Haruyuki Watanabe, Du-Yih Tsai, Yongbum Lee, Eri Matsuyama, Niigata Univ. (Japan); Katsuyuki Kojima, Hamamatsu Univ. (Japan) . . . . [7966-65]

Conference 7967 Posters

Advanced PACS-based Imaging Informatics and Therapeutic Applications

Improvement of MS (multiple sclerosis) CAD (computer aided diagnosis) performance using C/C++ and computing engine in the graphical processing unit (GPU), Joohyung Suh, Niloofar Eliyahoo, Kevin C. Ma, Anh H. Le, Brent J. Liu, The Univ. of Southern California (USA) [7967-30]

Content-based image retrieval with semantic navigation for medical images with multifocal diseases in integrated RIS/PACS system, Yanjie Zhu, Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . [7967-31]

DICOM structured report to track patient's radiation dose to organs from abdominal CT exams, Craig A. Morioka, VA Greater Los Angeles Healthcare System (USA); Adam C. Turner, Michael F. Mcnitt-Gray, Univ. of California, Los Angeles (USA); Maria A. Zankl, Helmholtz Zentrum München GmbH (Germany); Frank Meng, Suzie El-Saden M.D., VA Greater Los Angeles Healthcare System (USA) . . . . [7967-32]

Visualization index for image-enabled medical records, Wenjie Dong, Jianyong Sun, Weilin Zheng, Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . [7967-33]

Development of a user-centered radiology teaching file system, Marcelo dos Santos, Asa Fujino, Univ. de São Paulo (Brazil) . . . . [7967-34]

A solution for archiving and retrieving preclinical molecular imaging data in PACS using a DICOM gateway, Jasper Lee, Bihui Liu, Brent J. Liu, The Univ. of Southern California (USA) . . . . [7967-35]

Teleradiology network system and computer-aided diagnosis workstation using the web medical image conference system with a new information security solution, Hitoshi Satoh, Tokyo Health Care Univ. (Japan) . . . . [7967-36]

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 12
Room: Fiesta 5 . . . . . . .Wed. 8:00 to 9:40 am

CT III: Multi-energy

Session Chairs: **Thomas G. Flohr,** Siemens Medical Solutions GmbH (Germany); **John M. Sabol,** GE Healthcare

8:00 am: Synthetic CT: simulating arbitrary low dose single and dual energy protocols, Adam S. Wang, Norbert J. Pelc, Stanford Univ. (USA) . . . . [7961-62]

8:20 am: A tabletop clinical x-ray CT scanner with energy-resolving photon counting detectors, Jochen Cammin, Somesh Srivastava, The Johns Hopkins Univ. School of Medicine (USA); William C. Barber, Jan S. Iwanczyk, Neal E. Hartsough, DxRay Inc. (USA); Katsuyuki Taguchi, The Johns Hopkins Univ. School of Medicine (USA) . . . . [7961-63]

8:40 am: Investigating possible improvements in image quality with energy weighting photon counting breast CT, Stephen J. Glick, Kesava Kalluri, Univ. of Massachusetts Medical School (USA) . . . . [7961-64]

9:00 am: Temporal and spectral reconstruction algorithms for x-ray CT, Samuel M. Johnston, Cristian T. Badea, Duke Univ. (USA) . . . . [7961-65]

9:20 am: Material separation in x-ray CT with energy resolved photon-counting detectors, Xiaolan Wang, The Johns Hopkins Univ. (USA); Dirk Meier, Gamma Medica-Ideas, Inc. (Norway); Katsuyuki Taguchi, The Johns Hopkins Univ. (USA); Douglas J. Wagenaar, Bradley E. Patt, Gamma Medica-Ideas, Inc. (USA); Eric C. Frey, The Johns Hopkins Univ. (USA) . . . . [7961-66]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 8
Room: Fiesta 6 . . . . . . .Wed. 8:00 to 9:40 am

Segmentation II

Session Chair: **Aaron Fenster,** Robarts Research Institute (Canada)

8:00 am: A novel adaptive scoring system for segmentation validation with multiple reference masks, Jan H. Moltz, Jan Rühaak, Horst K. Hahn, Heinz-Otto Peitgen, Fraunhofer MEVIS (Germany) . . . . [7962-39]

8:20 am: Automatic model-based 3D segmentation of the breast in MRI, Cristina Gallego, Anne L. Martel, Sunnybrook Health Sciences Ctr. (Canada) and Univ. of Toronto (Canada) . . . [7962-40]

8:40 am: Fully automatic segmentation of complex organ systems: example of trachea, esophagus and heart segmentation in CT images, Carsten Meyer, Jochen Peters, Jürgen Weese, Philips Research (Germany) . . . . . [7962-41]

9:00 am: Automatic identification of cochlear implant electrode arrays for post-operative assessment, Jack H. Noble, Vanderbilt Univ. (USA); Theodore A. Schuman, Vanderbilt Univ. Medical Ctr. (USA); Charles G. Wright, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Robert F. Labadie, Benoit M. Dawant, Vanderbilt Univ. Medical Ctr. (USA)[7962-42]

9:20 am: Prostate segmentation with local binary patterns guided active appearance models, Soumya Ghose, Univ. de Bourgogne (France) and Univ. de Girona (Spain); Arnau Oliver, Robert Marti, Xavier Llado, Jordi Freixenet, Univ. de Girona (Spain); Joan C. Vilanova, Clínica Girona (Spain); Fabrice Meriaudeau, Univ. de Bourgogne (France) . . . . [7962-43]

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 5
Room: Fiesta 1-3. . . . . .Wed. 8:00 to 9:40 am

CBIR

Session Chair: **Hayit Greenspan,** Tel Aviv Univ. (Israel)

8:00 am: System for pathology categorization and retrieval in chest radiographs, Uri Avni, Hayit Greenspan, Tel Aviv Univ. (Israel); Eli Konen, Michal Sharon, Sheba Medical Ctr. (Israel); Jacob Goldberger, Bar-Ilan Univ. (Israel) . [7963-21]

8:20 am: Search for the best matching ultrasound frame based on spatial and temporal saliencies, Shaolei Feng, Xiaoyan Xiang, S. Kevin Zhou, Siemens Corporate Research (USA) . . . . [7963-22]

8:40 am: Optimized pathological and visual content-based neuroimaging retrieval, Sidong Liu, Weidong Cai, The Univ. of Sydney (Australia); Lingfeng Wen, Royal Prince Alfred Hospital (Australia); Stefan Eberl, The Univ. of Sydney (Australia); Michael Fulham, Royal Prince Alfred Hospital (Australia); Dagan Feng, The Univ. of Sydney (Australia) . . . . . . [7963-23]

9:00 am: Bone age assessment by content-based image retrieval and case-based reasoning, Benedikt Fischer, Petra Welter, RWTH Aachen (Germany); Christoph Grouls, Rolf W. Günther, Univ. Hospital Aachen (Germany); Thomas M. Deserno, RWTH Aachen (Germany) . . . . [7963-24]

9:20 am: Integrating user profile in medical CBIR systems to answer perceptual similarity queries, Pedro H. Bugatti, Univ. de São Paulo (Brazil); Daniel S. Kaster, Univ. Estadual de Londrina (Brazil); Marcelo Ponciano-Silva, Agma J. M. Traina, Caetano Traina, Jr., Univ. de São Paulo (Brazil) . . . . [7963-25]

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

Conference 7965 continued
Biomedical Applications in Molecular, Structural, and Functional Imaging
Room: Fiesta 8-10

SESSION 12
Room: Fiesta 8-10. . . . . .Wed. 8:00 to 9:40 am

Brain Imaging IV: fMRI

Session Chairs: **Axel Wismueller,** Univ. of Rochester Medical Ctr.; **Juan R. Cebral,** George Mason Univ.

8:00 am: Differential spatial activity patterns of acupuncture by a machine learning based analysis, Youbo You, Lijun Bai, Institute of Automation (China); Xue Ting, Xidian Univ. (China); Chongguang Zhong, Zhenyu Liu, Institute of Automation (China); Jie Tian, Institute of Automation (China) and Xidian Univ. (China) . . [7965-61]

8:20 am: The distributed neural system for top-down letter processing: an fMRI study, Jiangang Liu, Beijing Jiaotong Univ. (China); Lu Zi Feng M.D., Institute of Automation (China); Ling Li, Beijing Jiaotong Univ. (China); Jie Tian, Sr., Institute of Automation (China) . . . . [7965-62]

8:40 am: Real-time fMRI data analysis using region of interest selection based on fast ICA, Baoquan Xie, Xiaojie Zhao, Beijing Normal Univ. (China) . . . . . [7965-63]

9:00 am: The application of independent component analysis with projection method to two-task fMRI data over multiple subjects, Rui Li, Mingqi Hui, Li Yao, Beijing Normal Univ. (China); Kewei Chen, Banner Alzheimer's Institute (USA); Zhiying Long, Beijing Normal Univ. (China) . . . . [7965-64]

9:20 am: The functional alterations associated with motor imagery training: a comparison between motor execution and motor imagery of sequential finger tapping, Hang Zhang, Li Yao, Zhiying Long, Beijing Normal Univ. (China) . . . . . [7965-65]

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

SESSION 1
Room: Monterey 1-3 . . . .Wed. 8:00 to 9:40 am

Perception in Screening Exams:

Session Chair: **Darrin C. Edwards,** The Univ. of Chicago

8:00 am: Optimizing presentation of breast tomosynthesis image volumes using eye tracking combined with a free response human observer study., Kristina Lång, Sophia Zackrisson, Kenneth Holmqvist, Lund Univ. (Sweden); Ingvar Andersson, Daniel Förnvik, Anders Tingberg, Pontus A. S. Timberg, Skåne Univ. Hospital Malmö (Sweden) . . [7966-01]

8:20 am: Assessment of breast density: reader performance using synthetic mammographic images, Janine Makaronidis, Michael A. Berks, The Univ. of Manchester (UK); Julie Morris, Caroline R. Boggis, Mary Wilson, Nicky Barr, Univ. Hospital of South Manchester (UK); Susan M. Astley, The Univ. of Manchester (UK) . . . . [7966-02]

8:40 am: Health professionals' agreement on density judgements and successful abnormality identification within the UK Breast Screening Programme, Iain T. Darker, Yan Chen, Alastair G. Gale, Loughborough Univ. (UK) . . . . . . [7966-03]

9:00 am: The time course of cancer detection performance, Sian Taylor-Phillips, The Univ. of Warwick (UK); Alison Duncan, Univ. Hospitals Coventry (UK); Matthew G. Wallis, Addenbrooke's Hospital (UK); Alastair G. Gale, Loughborough Univ. (UK) . . . . [7966-04]

9:20 am: Can horizontally oriented breast tomosynthesis image volumes or the use of a systematic search strategy improve interpretation? An eye tracking and free response human observer study., Kristina Lång, Sophia Zackrisson, Kenneth Holmqvist, Lund Univ. (Sweden); Ingvar Andersson, Daniel Förnvik, Anders Tingberg, Pontus A. S. Timberg, Skåne Univ. Hospital Malmö (Sweden) . . [7966-05]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 13
Room: Fiesta 5 . . Wed. 10:10 am to 12:10 pm

Novel Systems

Session Chairs: **Mats Danielsson,** Royal Institute of Technology (Sweden); **Taly Gilat Schmidt,** Marquette Univ.

10:10 am: **An inverse geometry CT system with stationary source arrays**, Scott S. Hsieh, Norbert J. Pelc, Stanford Univ. (USA) . . . . [7961-67]

10:30 am: **Dual energy micro-CT imaging for differentiation of iodine and gold-based nanoparticles**, Cristian T. Badea, Samuel M. Johnston, Yi Qi, Duke Univ. Medical Ctr. (USA); Ketankumar Ghaghada, The Univ. of Texas Health Sciences Ctr. at Houston (USA); G. Allan Johnson, Duke Univ. Medical Ctr. (USA) . . . . [7961-68]

10:50 am: **Design and development of MR-Compatible SPECT systems for simultaneous SPECT-MR imaging of small animals**, Benjamin M. Tsui, The Johns Hopkins Outpatient Ctr. (USA); James W. Hugg, Gamma Medica-Ideas, Inc. (USA); Si Chen, Jingyan Xu, The Johns Hopkins Outpatient Ctr. (USA); Dirk Meier, Gamma Medica-Ideas, Inc. (USA); William Edelstein, Abdel-Monem El-Sharkawy, The Johns Hopkins Outpatient Ctr. (USA); Douglas J. Wagenaar, Bradley E. Patt, Gamma Medica-Ideas, Inc. (USA) . . . . [7961-69]

11:10 am: **Freehand SPECT in low uptake situations**, Tobias Lasser, Sibylle I. Ziegler, Nassir Navab, Technische Univ. München (Germany) . . . . [7961-70]

11:30 am: **Forward model of Cerenkov luminescence tomography with the third-order simplified spherical harmonics approximation**, Jianghong Zhong, Jie Tian, Sr., Xin Yang, Chenghu Qin, Institute of Automation (China) . . . . [7961-71]

11:50 am: **A preclinical SPECT camera with depth-of-interaction compensation using a focused-cut scintillator**, Vivek V. Nagarkar, Radiation Monitoring Devices, Inc. (USA); Fares Alhassen, Univ. of California, San Francisco (USA); Haris Kudrolli, Samta C. Thacker, Bipin Singh, Sangtaek Kim, Radiation Monitoring Devices, Inc. (USA); Youngho Seo, Robert G. Gould, Univ. of California, San Francisco (USA) . . . [7961-72]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 9
Room: Fiesta 6 . . Wed. 10:10 am to 12:10 pm

Registration II

Session Chair: **Bernd Fischer,** Univ. zu Lübeck (Germany)

10:10 am: **Probabilistic framework for subject-specific and population analysis of longitudinal changes and disease progression in brain MR images**, Annemie Ribbens, Jeroen Hermans, Frederik Maes, Dirk Vandermeulen, Paul Suetens, Katholieke Univ. Leuven (Belgium) [7962-44]

10:30 am: **A novel local-phase method of automatic atlas construction in fetal ultrasound**, Sana F. Fathima, Sylvia Rueda, Aris Papageorghiou, J. Alison Noble, Univ. of Oxford (UK) . . . . [7962-45]

10:50 am: **Atlas selection strategy in multi-atlas segmentation propagation with locally weighted voting using diversity-based MMR reranking**, Kaikai Shen, Australian e-Health Research Ctr. (Australia) and Univ. de Bourgogne (France); Pierrick T. Bourgeat, Australian e-Health Research Ctr. (Australia); Fabrice Meriaudeau, Univ. de Bourgogne (Australia); Olivier Salvado, Australian e-Health Research Ctr. (Australia) . . . . [7962-46]

11:10 am: **Multi-modal surface comparison and its application to intra-operatively acquired range data**, Thiago R. dos Santos, Alexander Seitel, Thomas Kilgus, Tobias Heimann, Hans-Peter Meinzer, Lena Maier-Hein, Deutsches Krebsforschungszentrum (Germany) . . . . [7962-47]

11:30 am: **Distance transforms in multichannel MR image registration**, Min Chen, Aaron Carass, John Bogovic, Pierre-Louis Bazin, Jerry L. Prince, The Johns Hopkins Univ. (USA) . . . . [7962-48]

11:50 am: **Validation of histology image registration**, Rushin Shojaii, Tigran Karavaryan, Sunnybrook Health Sciences Ctr. (Canada); Martin J. Yaffe, Sunnybrook Health Sciences Ctr. (Canada) and Sunnybrook Health Sciences Ctr. (Canada); Anne L. Martel, Sunnybrook Health Sciences Ctr. (Canada) and Univ. of Toronto (Canada) . . . . [7962-49]

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 6
Room: Fiesta 1-3. Wed. 10:10 am to 12:10 pm

Liver and Prostate

Session Chair: **Kensaku Mori,** Nagoya Univ. (Japan)

10:10 am: **A method for mass candidate detection and an application to liver lesion detection**, Maria J. Costa, Alexey Tsymbal, Siemens AG (Germany); Michael Suehling, S. Kevin Zhou, Dorin Comaniciu, Siemens Corporate Research (USA) . . . . . . [7963-26]

10:30 am: **Computer-aided detection of hepatocellular carcinoma in multiphase contrast-enhanced hepatic CT: a preliminary study**, Jianwu Xu, Kenji Suzuki, The Univ. of Chicago Medical Ctr. (USA); Masatoshi Hori, Osaka Univ. (Japan); Aytekin Oto, Richard Baron, The Univ. of Chicago Medical Ctr. (USA) . . . . . [7963-27]

10:50 am: **Automatic computer aided detection of abnormalities in multi-parametric prostate MRI**, Geert Litjens, Pieter Vos, Jelle Barentsz, Nico Karssemeijer, Henkjan Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . [7963-28]

11:10 am: **Enhanced multi-protocol analysis via intelligent supervised embedding (EMPrAvISE): detecting prostate cancer on multi-parametric MRI**, Satish E. Viswanath, Jonathan C. Chappelow, Pratik Patel, Rutgers, The State Univ. of New Jersey (USA); B. Nicholas Bloch, Boston Medical Ctr. (USA); Neil M. Rofsky, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Robert E. Lenkinski, Elizabeth M. Genega, Beth Israel Deaconess Medical Ctr. (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . . [7963-29]

11:30 am: **Empirical evaluation of bias field correction algorithms for computer-aided detection of prostate cancer on T2w MRI**, Satish E. Viswanath, Daniel Palumbo, Jonathan C. Chappelow, Pratik Patel, Rutgers, The State Univ. of New Jersey (USA); B. Nicholas Bloch, Boston Medical Ctr. (USA); Neil M. Rofsky, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA); Robert E. Lenkinski, Elizabeth M. Genega, Beth Israel Deaconess Medical Ctr. (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA). . [7963-30]

11:50 am: **Automated determination of arterial input function for DCE-MRI of the prostate**, Yingxuan Zhu, Syracuse Univ. (USA); Ming-Ching Chang, Sandeep Gupta, GE Global Research (USA) . . . . . . [7963-31]

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

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

SESSION 2
Room: Monterey 1-3 . . . . . . Wed. 10:10 am to 12:10 pm

Human Performance

Session Chair: **Elizabeth A. Krupinski,** The Univ. of Arizona

10:10 am: **Modeling error in assessment of mammographic image features for improved computer-aided mammography training: initial experience**, Maciej A. Mazurowski, Georgia D. Tourassi, Duke Univ. (USA) . . . . [7966-06]

10:30 am: **Does the time of day affect radiologists' performance in digital mammography reporting?**, Muhammad Al-s'adi, Patrick C. Brennan, Warren Reed, Mark F. McEntee, Elaine Ryan, The Univ. of Sydney (Australia) . . . . [7966-07]

10:50 am: **Effect of learning with feedback on the detectability of pulmonary nodules in chest tomosynthesis**, Sara Asplund, Göteborg Univ. (Sweden) and Sahlgrenska Univ. Hospital (Sweden); Åse A. Johnsson, Jenny Vikgren M.D., Sahlgrenska Univ. Hospital (Sweden) and Göteborg Univ. (Sweden); Angelica Svalkvist, Göteborg Univ. (Sweden) and Sahlgrenska Univ. Hospital (Sweden); Marianne Boijsen M.D., Valeria Fisichella, Agneta Flinck M.D., Åsa Wiksell, Sahlgrenska Univ. Hospital (Sweden) and Göteborg Univ. (Sweden); Jonas Ivarsson, Hans Rystedt, Göteborg Univ. (Sweden); Lars Gunnar Månsson, Göteborg Univ. (Sweden) and Sahlgrenska Univ. Hospital (Sweden); Susanne Kheddache M.D., Sahlgrenska Univ. Hospital (Sweden) and Göteborg Univ. (Sweden); Magnus Båth, Göteborg Univ. (Sweden) and Sahlgrenska Univ. Hospital (Sweden) . . . . [7966-08]

11:10 am: **Classification of radiological errors in chest radiographs using a support vector machine on the spatial frequency features of false-negative and false-positive regions**, Mariusz W. Pietrzyk, The Univ. of Sydney (Australia); Tim Donovan, Lancaster Univ. (UK); Patrick C. Brennan, The Univ. of Sydney (Australia); Alan Dix, David J. Manning, Lancaster Univ. (UK) . . . . [7966-09]

11:30 am: **A novel platform to simplify human observer performance experiments in clinical reading environments**, Jurgen Jacobs, Federica Zanca, Hilde Bosmans, Univ. Ziekenhuizen Leuven (Belgium) . . . . [7966-10]

11:50 am: **Analysis of physiological impact while reading stereoscopic radiographs**, Yasuko Y. Unno, Takashi Tajima, Takao Kuwabara, FUJIFILM Corp. (Japan); Akira Hasegawa, FUJIFILM Medical Systems USA, Inc. (USA); Nobutaka Natsui, Kazuo Ishikawa, Tokyo Polytechnic Univ. (Japan); Toyohiko Hatada, Tokyo Optometric College (Japan) . . . . [7966-11]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 14
Room: Fiesta 5 . . . . Wed. 1:20 to 3:00 pm

CT IV: Cone Beam

Session Chairs: **Maria Drangova,** Robarts Research Institute (Canada); **Marc Kachelriess,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

1:20 pm: **Evaluation of an Erbium Modulator in X-ray Scatter Correction Using Primary Modulation**, Hewei Gao, GE Global Research (USA); Lei Zhu, Georgia Institute of Technology (USA); Rebecca Fahrig, Stanford Univ. (USA) . . . . . [7961-73]

1:40 pm: **Analysis of vertical and horizontal circular C-arm trajectories**, Andreas K. Maier, Jang-Hwang Choi, Andreas Keil, Stanford Univ. (USA); Christine Niebler, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Marily Sarmiento, Siemens AG (Germany); Andreas Fieselmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Garry Gold, Scott Delp, Rebecca Fahrig, Stanford Univ. (USA) . . . . [7961-74]

2:00 pm: **Functional phase-correlated micro-CT imaging of small rodents with low dose**, Stefan Sawall, Andreas Hess, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Robert M. Lapp, Markus Mronz, CT Imaging GmbH (Germany); Marek Karolczak, Frank Bergner, Marc Kachelriess, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . [7961-75]

2:20 pm: **Scatter correction for cone-beam computed tomography using moving blocker strips**, Jing Wang, Weihua Mao, Timothy D. Solberg, The Univ. of Texas Southwestern Medical Ctr. at Dallas (USA) . . . . [7961-76]

2:40 pm: **Single-scan scatter correction for cone-beam CT using a stationary beam blocker: theory and preliminary study**, Tianye Niu, Lei Zhu, Georgia Institute of Technology (USA) . . . . [7961-77]

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

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 10
Room: Fiesta 6 . . . . Wed. 1:20 to 3:00 pm

Image Enhancement/ Classification

Session Chair: **Tianhu Lei,** The Children's Hospital of Philadelphia

1:20 pm: **Intensity inhomogeneity correction of magnetic resonance images using patches**, Snehashis Roy, Aaron Carass, Pierre-Louis Bazin, Jerry L. Prince, The Johns Hopkins Univ. (USA) . . [7962-50]

1:40 pm: **Initial evaluation of virtual un-enhanced imaging derived from fast kVp-switching dual energy contrast enhanced CT for the abdomen**, Mukta C. Joshi, GE Healthcare (USA); Paulo R. S. Mendonca, GE Global Research (USA); Darin R. Okerlund, Peter Lamb, GE Healthcare (USA); Naveen Kulkarni, Dushyant V. Sahani, Massachusetts General Hospital (USA); Rahul Bhotika, GE Global Research (USA) . . . . [7962-51]

2:00 pm: **A neural network learned information theoretic measure for heart motion abnormality detection**, Mohammad Saleh Nambakhsh, Kumaradevan Punithakumara, Ismail Ben Ayed, The Univ. of Western Ontario (Canada); Terry Peters, Robarts Research Institute (Canada); Shuo Li, Lawson Health Research Institute (Canada) . . . . . [7962-52]

2:20 pm: **Content-based image retrieval utilizing shape modeling and manifold learning**, Rachel E. Sparks, Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA) . . . . [7962-53]

2:40 pm: **Amplitude remapping as a step towards standardizing the analysis of MR-images**, Mona S. Frommert, Univ. of Geneva (Switzerland) and Max-Planck-Institut für Astrophysik (Germany); Irina N. Sidorenko, Max-Planck-Institut für extraterrestrische Physik (Germany); Jan S. Bauer, Dirk Mueller, Ernst J. Rummeny, Technische Univ. München (Germany); Felix Eckstein, Paracelsus Medizinische Privatuniversität (Austria); Roberto A. Monetti, Christoph W. Raeth, Max-Planck-Institut für extraterrestrische Physik (Germany) . . . . [7962-170]

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 7
Room: Fiesta 1-3. . . . . . Wed. 1:20 to 3:00 pm

Breast Imaging II

Session Chair: **Nicholas A. Petrick,** U.S. Food and Drug Administration

1:20 pm: **Classification of breast lesions in automated 3D breast ultrasound**, Tao Tan, Henkjan Huisman, Bram Platel, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Andre R. Grivegnee, Institut Jules Bordet (Belgium); Roel Mus, Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands). . . . . . [7963-32]

1:40 pm: **Exploring deep parametric embeddings for breast CADx**, Andrew R. Jamieson, The Univ. of Chicago (USA); Rabi Alam, Bard College at Simon's Rock (USA); Maryellen L. Giger, The Univ. of Chicago (USA) . . . . [7963-33]

2:00 pm: **The impact of motion correction on lesion characterization in DCE breast MR images**, Martin Bergtholdt, Sven Kabus, Rafael Wiemker, Thomas Buelow, Philips Research (Germany) . . . . . [7963-34]

2:20 pm: **Incorporating domain knowledge for tubule detection in breast histopathology using O'Callaghan neighborhoods**, Ajay N. Basavanhally, Elaine Yu, Rutgers, The State Univ. of New Jersey (USA); Shridar Ganesan, Univ. of Medicine & Dentistry of New Jersey (USA); Michael D. Feldman, John E. Tomaszewski, The Univ. of Pennsylvania Health System (USA); Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA). . [7963-35]

2:40 pm: **Computer-aided detection of breast masses in digital breast tomosynthesis (DBT): improvement of false positive reduction by optimization of object segmentation**, Jun Wei, Heang-Ping Chan, Berkman Sahiner, Mark A. Helvie, Lubomir M. Hadjiiski, Chuan Zhou, Yao Lu, Univ. of Michigan Health System (USA) . . . . [7963-36]

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

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

SESSION 3
Room: Monterey 1-3. . . . Wed. 1:20 to 3:00 pm

Model Observers

Session Chair: **Anthony J. Maeder,** Univ. of Western Sydney (Australia)

1:20 pm: **Incorporating holistic search into a SPECT myocardial perfusion imaging numerical observer**, J. Michael O'Connor, Howard C. Gifford, Univ. of Massachusetts Medical School (USA); Jovan G. Brankov, Illinois Institute of Technology (USA); Petrus H. Pretorius, Univ. of Massachusetts Medical School (USA) . . . . [7966-12]

1:40 pm: **Channelized relevance vector machine as a numerical observer for cardiac perfusion defect detection task**, Mahdi M. Kalayeh, Illinois Institute of Technology (USA); Petrus H. Pretorius, Univ. of Massachusetts Medical School (USA); Miles N. Wernick, Yongyi Yang, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . [7966-13]

2:00 pm: **Development of model observers applied to 3D breast tomosynthesis microcalcifications and masses**, Ivan Diaz, Ctr. Hospitalier Univ. Vaudois (Switzerland); Pontus A. S. Timberg, Skåne Univ. Hospital Malmö (Sweden); Sheng Zhang, Craig K. Abbey, Univ. of California, Santa Barbara (USA); Francis R. Verdun, François Bochud, Ctr. Hospitalier Univ. Vaudois (Switzerland) . . . . [7966-14]

2:20 pm: **Numerical observer for cardiac motion assessment using machine learning**, Thibault Marin, Mahdi M. Kalayeh, Illinois Institute of Technology (USA); Petrus H. Pretorius, Univ. of Massachusetts Medical School (USA); Miles N. Wernick, Yongyi Yang, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . [7966-15]

2:40 pm: **Accounting for anatomical noise in SPECT with a visual-search human-model observer**, Howard C. Gifford, Michael A. King, Mark S. Smyczynski, Univ. of Massachusetts Medical School (USA) . . . . [7966-16]

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

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications
Room: Fiesta 8-10

SESSION 1
Room: Fiesta 8-10. . . . . Wed. 1:20 to 3:00 pm

Keynote and Database and Data Mining I

Session Chair: **John B. Strauss,** Microscoft Corp.

1:20 pm: **Brain-behavior correlates of neurorehabilitation: challenges and opportunities for transformational interdisciplinary collaborations** *(Keynote Presentation),* Carolee J. Winstein, The Univ. of Southern California (USA) . . . . [7967-01]

2:00 pm: **Combined semantic and similarity search in medical image databases**, Sascha Seifert, Siemens AG (Germany); Marisa Thoma, Ludwig-Maximilians-Univ. München (Germany); Florian Stegmaier, Univ. of Passau (Germany); Matthias Hammon, Universitätsklinikum Erlangen (Germany); Mario Doeller, Univ. of Passau (Germany); Hans-Peter Kriegel, Ludwig-Maximilians-Univ. München (Germany); Alexander Cavallaro, Universitätsklinikum Erlangen (Germany); Dorin Comaniciu, Siemens Corporate Research (Germany). . . [7967-02]

2:20 pm: **Automatic semantic annotation and validation of anatomy in DICOM CT images**, Sayan D. Pathak, Microsoft Corp. (USA); Antonio Criminisi, Microsoft Research Cambridge (UK); Steve White, Microsoft Corp. (USA); Indeera Munasinghe, Microsoft Research Cambridge (UK); Bobbi Sparks, Microsoft Corp. (USA); D. Robertson, Microsoft Research Cambridge (UK); Khan M. Siddiqui M.D., Microsoft Corp. (USA) . . . . [7967-03]

2:40 pm: **The utility of rapid database searching for quality assurance: 'detective work' in uncovering radiology coding and billing errors**, Steven C. Horii, Woojin Kim, William Boonn, Christopher Iyoob, Keith Maston, Beverly Coleman, The Univ. of Pennsylvania Health System (USA) . . . . [7967-04]

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 15
Room: Fiesta 5 . . . . Wed. 3:30 to 5:30 pm

Dose

Session Chairs: **Iacovos S. Kyprianou**, U.S. Food and Drug Administration; **Hee-Joung Kim**, Yonsei Univ. (Korea, Republic of)

3:30 pm: **Verification of the performance accuracy of a real-time skin-dose tracking system for interventional fluoroscopic procedures**, Daniel R. Bednarek, Jeffery Barbarits, Vijay K. Rana, Srikanta P. Nagaraja, Madhur S. Josan, Stephen Rudin, Univ. at Buffalo (USA) . . . . [7961-78]

3:50 pm: **Energy deposition in the breast during CT scanning: quantification and implications for dose reduction**, Franco Rupcich, Taly G. Schmidt, Marquette Univ. (USA) . . . . [7961-79]

4:10 pm: **Uncertainties of organ absorbed doses to patients from 18F-cholin**, Weibo Li, Tilman Janzen, Augusto Giussani, Maria A. Zankl, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany) . . . . [7961-80]

4:30 pm: **The feasibility of universal DLP-to-risk conversion coefficients for body CT protocols**, Xiang Li, Ehsan Samei, W. Paul Segars, Erik K. Paulson, Donald P. Frush M.D., Duke Univ. (USA) . . . . [7961-81]

4:50 pm: **X-ray dose reduction by adaptive source equalization and electronic region-of-interest control**, Tobias Funk, Steve Burion, Kate L. Bechtel, Triple Ring Technologies, Inc. (USA); Edward G. Solomon, NovaRay Medical, Inc. (USA) . . . . [7961-82]

5:10 pm: **Effect of contrast magnitude on noise-resolution tradeoffs in x-ray CT imaging: a comparison of penalized alternating minimization and filtered backprojection algorithms**, Joshua D. Evans, Virginia Commonwealth Univ. (USA); David G. Politte, Bruce R. Whiting, Joseph A. O'Sullivan, Washington Univ. in St. Louis (USA); Jeffrey F. Williamson, Virginia Commonwealth Univ. (USA) . . . . . [7961-83]

Conference 7962 continued
Image Processing
Room: Fiesta 6

SESSION 11
Room: Fiesta 6 . . . . .Wed. 3:30 to 5:30 pm

Segmentation of Vascular Images

Session Chair: **Boudewijn P. F. Lelieveldt**, Leids Univ. Medisch Ctr. (Netherlands)

3:30 pm: **Machine learning based vesselness measurement for coronary artery segmentation in cardiac CT volumes**, Yefeng Zheng, Maciej Loziczonek, Bogdan Georgescu, S. Kevin Zhou, Siemens Corporate Research (USA); Fernando Vega-Higuera, Siemens Medical Solutions GmbH (Germany); Dorin Comaniciu, Siemens Corporate Research (USA) . . . . [7962-55]

3:50 pm: **Automated vasculature extraction from placenta images**, Nizar Almoussa, Brittany Dutra, Univ. of California, Los Angeles (USA); Bryce Lampe, Harvey Mudd College (USA); Pascal T. Getreuer, Todd Wittman, Univ. of California, Los Angeles (USA); Carolyn M. Salafia, Placental Analytics, LLC (USA); Luminita A. Vese, Univ. of California, Los Angeles (USA). . . . . [7962-56]

4:10 pm: **Level set based vessel segmentation accelerated with periodic monotonic speed function**, Chunliang Wang, Ctr. for Medical Image Science and Visualization (Sweden); Hans Frimmel, Uppsala Univ. (Sweden); Örjan Smedby, Ctr. for Medical Image Science and Visualization (Sweden). . . . . [7962-57]

4:30 pm: **Multispectral MRI centerline tracking in carotid arteries**, Hui Tang, Technische Univ. Delft (Netherlands) and Erasmus MC (Netherlands); Theo van Walsum, Robbert S. van Onkelen, Stefan Klein, Erasmus MC (Netherlands); Reinhard Hameeteman M.D., Univ. Medisch Ctr. Rotterdam (Netherlands); Michiel Schaap, Quirijn J. A. van den Bouwhuijsen, Jacqueline C. M. Witteman, Erasmus MC (Netherlands); Aad van der Lugt, Univ. Medisch Ctr. Rotterdam (Netherlands); Lucas J. van Vliet, Technische Univ. Delft (Netherlands); Wiro J. Niessen, Erasmus MC (Netherlands) and Technische Univ. Delft (Netherlands) [7962-58]

4:50 pm: **CARES—completely automated robust edge snapper for carotid ultrasound IMT measurement on a multi-institutional database of 300 images: a two stage system combining An intensity-based feature approach with first order absolute moments**, Filippo Molinari, Politecnico di Torino (Italy); Rajendra U. Acharya, Ngee Ann Polytechnic (Singapore); Guang Zeng, Mayo Clinic (USA); Jasjit S. Suri, Biomedical Technologies, Inc. (USA) and Idaho State Univ. (USA). . . . . [7962-59]

5:10 pm: **Gradient-based 3D-2D registration of cerebral angiograms**, Uroš Mitrović, Primož Markelj, Boštjan Likar, Zoran Milošević M.D., Franjo Pernuš, Univ. of Ljubljana (Slovenia) . . . . [7962-60]

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 8
Room: Fiesta 1-3. . . . . . .Wed. 3:30 to 5:30 pm

Novel Applications and Retina

Session Chair: **Janne J. Nappi**, Massachusetts General Hospital

3:30 pm: **Analysis of adipose tissue distribution using whole-body magnetic resonance imaging**, Diana Wald, Tobias Schwarz, Julien Dinkel, Stefan Delorme, Birgit Teucher, Rudolf Kaaks, Hans-Peter Meinzer, Tobias Heimann, German Cancer Research Ctr. (Germany). . . . . . . [7963-37]

3:50 pm: **Computer-aided abdominal lymph node detection using contrast-enhanced CT images**, Jiamin Liu, Jianhua Yao, Jacob M. White, Ronald M. Summers, National Institutes of Health (USA) [7963-38]

4:10 pm: **Novel approach for building linked statistical shape models for multimodal prostate radiotherapy planning**, Najeeb Chowdhury, Jonathan C. Chappelow, Robert J. Toth, Anant Madabhushi, Rutgers, The State Univ. of New Jersey (USA); Sung Kim, Robert Wood Johnson Univ. Hospital (USA) . . . . [7963-39]

4:30 pm: **Sampling-based ensemble segmentation against inter-operator variability**, Jing Huo, Univ. of California, Los Angeles (USA); Kazunori Okada, San Francisco State Univ. (USA); Whitney B. Pope, Matthew S. Brown, Univ. of California, Los Angeles (USA) . . . . [7963-40]

4:50 pm: **Toward comprehensive detection of sight threatening retinal disease using a multiscale AM-FM methodology**, Carla P. Agurto Rios, Simon Barriga, VisionQuest Biomedical, LLC (USA); Victor M. Murray, The Univ. of New Mexico (USA); Sergio Murillo, VisionQuest Biomedical, LLC (USA); Marios Pattichis, The Univ. of New Mexico (USA); Gilberto Zamora, VisionQuest Biomedical, LLC (USA); Wendall C. Bauman, Retina Institute of South Texas (USA); Peter Soliz, VisionQuest Biomedical, LLC (USA) . . . . [7963-41]

5:10 pm: **Fast localization of optic disc and fovea in retinal images for eye disease screening**, Honggang Yu, The Univ. of New Mexico (USA); Simon Barriga, VisionQuest Biomedical, LLC (USA); Carla P. Agurto Rios, The Univ. of New Mexico (USA); Sebastian Echegaray, VisionQuest Biomedical, LLC (USA); Marios Pattichis, The Univ. of New Mexico (USA); Gilberto Zamora, VisionQuest Biomedical, LLC (USA); Wendall C. Bauman, Retina Institute of South Texas (USA); Peter Soliz, VisionQuest Biomedical, LLC (USA) . . . . [7963-42]

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

SESSION 4
Room: Monterey 1-3. . . .Wed. 3:30 to 5:30 pm

ROC and Decision Metrics

Session Chair: **Matthew A. Kupinski**, College of Optical Sciences, The Univ. of Arizona

3:30 pm: **Support of the decision variable densities of the three-class ideal observer for bivariate trinormal data**, Darrin C. Edwards, The Univ. of Chicago (USA) . . . . [7966-17]

3:50 pm: **Agreement between two versions of a CADx system: a simulation study**, Berkman Sahiner, Nicholas A. Petrick, Sophie Paquerault, Weijie Chen, Tien Nguyen, U.S. Food and Drug Administration (USA). . . . . [7966-18]

4:10 pm: **Reader characteristics linked to detection of pulmonary nodules on radiographs: ROC vs JAFROC analyses of performance.**, Akshay Kohli, John W. Robinson, John Ryan, Mark F. McEntee, Patrick C. Brennan, The Univ. of Sydney (Australia). . . . . [7966-19]

4:30 pm: **Estimating parameters of a model of visual search from ROC data: an alternate method for fitting proper ROC curves**, Dev P. Chakraborty, Univ. of Pittsburgh (USA); Tony M. F. Svahn, Skåne Univ. Hospital Malmö (Sweden) . . [7966-20]

4:50 pm: **Characterizing and optimizing rater performance for internet-based collaborative labeling**, Joshua A. Stein, Andrew J. Asman, Bennett A. Landman, Vanderbilt Univ. (USA). . . . . [7966-21]

5:10 pm: **ROC analysis as a normative practice**, Xin He, Unaffiliated (USA) . . . . [7966-22]

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications
Room: Fiesta 8-10

SESSION 2
Room: Fiesta 8-10. . . . . .Wed. 3:30 to 5:30 pm

Database and Data Mining II

Session Chair: **Stefan L. Zimmerman**, Hospital of the Univ. of Pennsylvania

3:30 pm: **Multiscale salient point-based retrieval of fracture cases**, Xin Zhou, Richard Stern, Univ. Hospital of Geneva (Switzerland); Henning Müller, HES-SO Valais (Switzerland) . . . . [7967-05]

3:50 pm: **Using relevant regions in image search and query refinement for medical CBIR**, Edward Kim, Lehigh Univ. (USA); Sameer K. Antani, National Library of Medicine (USA); Xiaolei Huang, Lehigh Univ. (USA); L. Rodney Long, Dina Demner-Fushman, National Library of Medicine (USA) . . . . [7967-06]

4:10 pm: **Is there a need for biomedical CBIR systems in clinical practice?: outcomes from a usability study**, Sameer K. Antani, Zhiyun Xue, L. Rodney Long, Deborah Bennett, Sarah Ward, George R. Thoma, National Library of Medicine (USA) . . . . [7967-07]

4:30 pm: **Development of a data mining and imaging informatics display tool for a multiple sclerosis e-folder system**, Margaret Liu, Jerry Loo, Kevin C. Ma, Brent J. Liu, The Univ. of Southern California (USA) . . . . [7967-08]

4:50 pm: **Development of automated detection of radiology reports citing incidental adrenal findings**, Jason Zopf, Jessica Langer, Univ. of Pennsylvania (USA); William Boonn, Woojin Kim, The Univ. of Pennsylvania Health System (USA); Hanna Zafar, Univ. of Pennsylvania (USA) . . [7967-09]

5:10 pm: **Automated BI-RADS 3 follow-up application: improving patient care and compliance**, Praveena Kandula M.D., Tessa S. Cook, William Boonn, Woojin Kim, The Univ. of Pennsylvania Health System (USA) . . . . [7967-10]

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

SESSION 16
Room: Fiesta 5 . . . . Thurs. 8:00 to 9:40 am

Special Session I: Dose
Session Chairs: **Ehsan Samei**, Duke Univ.; **Dianna D. Cody**, The Univ. of Texas M.D. Anderson Cancer Ctr

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See Special Events on page 11 for Additional Details

8:00 am: **Definitions and outlook** *(Invited Paper)*, Dieter Regulla, Helmholtz Zentrum München GmbH (Germany) . . . . [7961-84]

8:20 am: **Biological effects of low-level of radiation: cancer** *(Invited Paper)*, Charles Land, National Cancer Institute, NIH (USA) . . . . [7961-85]

8:40 am: **How do we measure dose and estimate risk?** *(Invited Paper)*, Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany) . . . . [7961-86]

9:00 am: **The accuracy of estimated organ doses from Monte Carlo CT simulations using cylindrical regions of interest within organs**, Maryam Khatonabadi, Jesse Sandberg, Univ. of California, Los Angeles (USA); Naghmehossadat Eshghi, Heinrich-Heine-Univ. Düsseldorf (Germany); John J. DeMarco, Univ. of California, Los Angeles (USA); Erin Angel, Toshiba America Medical Systems, Inc. (USA); Adam C. Turner, Di Zhang, Christopher H. Cagnon, Michael F. McNitt-Gray, Univ. of California, Los Angeles (USA) . . . . [7961-87]

9:20 am: **An algorithm for intelligent sorting of CT-related dose parameters**, Tessa S. Cook, The Univ. of Pennsylvania Health System (USA); Stefan L. Zimmerman M.D., The Johns Hopkins Univ. (USA); Scott Steingal, William Boonn, Woojin Kim, The Univ. of Pennsylvania Health System (USA). . . . . [7961-88]

Poster Award Announcements
Room: Fiesta 5 . . . . Thurs. 9:40 to 9:45 am

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

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

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

SESSION 9
Room: Fiesta 1-3. . . . . . . Thurs. 8:00 to 9:40 am

Machine Learning
Session Chair: **Marleen de Bruijne**, Erasmus MC (Netherlands)

8:00 am: **Texture feature selection with relevance learning to classify interstitial lung disease patterns**, Markus B. Huber, Univ. of Rochester (USA); Kerstin Bunte, Univ. of Groningen (Netherlands); Mahesh B. Nagarajan, Univ. of Rochester (USA); Michael Biehl, Univ. of Groningen (Netherlands); Lawrence A. Ray, Carestream Health, Inc. (USA); Axel Wismueller, Univ. of Rochester (USA) . . . . [7963-43]

8:20 am: **A robust independent component analysis (ICA) model for functional magnetic resonance imaging (fMRI) data**, Jingqi Ao, Sunanda D. Mitra, Brian S. Nutter, Texas Tech Univ. (USA). . . . . [7963-44]

8:40 am: **Manifold learning for dimensionality reduction and clustering of skin spectroscopy data**, Asad Safi, Victor Castañeda, Tobias Lasser, Diana Mateus, Nassir Navab, Technische Univ. München (Germany) . . . . [7963-45]

9:00 am: **A cost constrained boosting algorithm for fast lesion detection and segmentation**, Arne Militzer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Christian Tietjen, Siemens Medical Solutions GmbH (Germany); Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)[7963-46]

9:20 am: **Balancing the training dataset using convex skin**, Balathasan Giritharan, Xiaohui Yuan, Univ. of North Texas (USA). . . . . [7963-47]

Poster Award Announcements
Room: Fiesta 1-3 . . . . Thurs. 9:40 to 9:45 am

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

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

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

SESSION 5
Room: Monterey 1-3 . . . . . Thurs. 8:00 to 9:40 am

Keynote and Assessment in Pathology
Session Chair: **Berkman Sahiner**, Univ. of Michigan Health System

8:00 am: **Imaging in health economics** *(Keynote Presentation)*, Stephen M. Hewitt, National Institutes of Health (USA). . . . . . . [7966-23]

9:00 am: **Changes in visual search patterns of pathology residents as they gain experience**, Elizabeth A. Krupinski, Ronald S. Weinstein, The Univ. of Arizona (USA) . . . . [7966-24]

9:20 am: **Characterizing virtual slide exploration through use of 'search maps'**, Claudia R. Mello-Thoms, Univ. of Pittsburgh Cancer Institute (USA); Carlos A. Mello, Univ. Federal de Pernambuco (Brazil); Olga Medvedeva, Eugene Tseytlin, Rebecca Crowley, Univ. of Pittsburgh (USA). . . . . [7966-25]

Poster Award Announcements
Room: Monterey 1-3 . . . . Thurs. 9:40 to 9:45 am

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

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

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications
Room: Fiesta 8-10

SESSION 3
Room: Fiesta 8-10. . . . . . Thurs. 8:00 to 9:40 am

System Integration and Visualization: Translational Research
Session Chair: **Woojin Kim**, The Univ. of Pennsylvania Health System

8:00 am: **Towards building high performance medical image management system for clinical trials**, Fusheng Wang, Emory Univ. (USA); Rubao Lee, Xiaodong Zhang, The Ohio State Univ. (USA); Joel H. Saltz M.D., Emory Univ. (USA) . . . . [7967-11]

8:20 am: **Transforming medical imaging applications into collaborative PACS-based telemedical systems**, Rouzbeh Maani, Sergio Camorlinga, Neil Arnason, Univ. of Manitoba (Canada) . . . . [7967-12]

8:40 am: **Integrating medical imaging analyses through a high-throughput bundled resource imaging system**, Kelsie Covington, E. Brian Welch, Ha-Kyu Jeong, Bennett A. Landman, Vanderbilt Univ. (USA) . . . . [7967-13]

9:00 am: **Viability of sharing MEG data using minimum-norm imaging**, Syed Ashrafulla, Dimitrios Pantazis, The Univ. of Southern California (USA); John C. Mosher, The Cleveland Clinic (USA); Matti Hamalainen, Massachusetts General Hospital (USA); Brent J. Liu, Richard M. Leahy, The Univ. of Southern California (USA) . . . . [7967-14]

9:20 am: **Mobile medical image retrieval,** Samuel Duc, Adrien Depeursinge, Ivan Eggel, Henning Müller, HES-SO Valais (Switzerland) . . . . [7967-15]

Poster Award Announcements
Room: Fiesta 8-10 . . . . Thurs. 9:40 to 9:45 am

The Advanced PACS-based Imaging Informatics and Therapeutic Applications conference poster award recipients will be recognized and certificates distributed.

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

Conference 7961 continued
Physics of Medical Imaging
Room: Fiesta 5

Conference 7963 continued
Computer-Aided Diagnosis
Room: Fiesta 1-3

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment
Room: Monterey 1-3

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications
Room: Fiesta 8-10

SESSION 17
Room: Fiesta 5 . . . . Thurs. 10:10 to 11:30 am

Special Session II: Dose
Session Chairs: **Christoph Hoeschen**, Helmholtz Zentrum München GmbH (Germany); **Michael F. McNitt-Gray**, Univ. of California, Los Angeles

10:10 am: **Evidence-based optimization of image quality/dose in CT** *(Invited Paper)*, Ehsan Samei, Duke Univ. (USA) . . . . [7961-89]

10:30 am: **Clinical optimization of protocols** *(Invited Paper)*, Dianna D. Cody, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA) . . . . [7961-90]

10:50 am: **Dose reduction using prior image constrained compressed sensing (DR-PICCS)**, Jie Tang, Guang-Hong Chen, Univ. of Wisconsin-Madison (USA) . . . . [7961-91]

11:10 am: **A clinical comparison study of a novel statistical iterative- and filtered-backprojection reconstruction**, Peter B. Noel, Alexander A. Fingerle, Bernhard C. Renger, Technische Univ. München (Germany); Liran Goshen, Philips Medical Systems Technologies Ltd. (Israel); Dirk K. Müller, Philips GmbH (Germany); Ernst J. Rummeny, Martin Dobritz, Technische Univ. München (Germany) . . . . . . [7961-92]

> **Panel Discussion**
> **Room: Fiesta 5 . . . . Thurs. 11:30 am to 12:10 pm**
>
> #### Special Session III: Dose
> *Panel Moderator*: **Ehsan Samei**, Duke Univ.
>
> Where do we stand, What are the unresolved scientific gaps, and Interactions of science and public perception.

SESSION 10
Room: Fiesta 1-3. . . Thurs. 10:10 am to 12:10 pm

Colon and Other Gastrointestinal CAD
Session Chair: **Kenji Suzuki**, The Univ. of Chicago Medical Ctr.

10:10 am: **Probabilistic method for context-sensitive detection of polyps in CT colonography**, Janne J. Näppi, Massachusetts General Hospital (USA); Daniele Regge, Institute for Cancer Research and Treatment (Italy); Hiroyuki Yoshida, Massachusetts General Hospital (USA) . . . . [7963-48]

10:30 am: **Detection of longitudinal ulcer using roughness value for computer aided diagnosis of Crohn's disease**, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazuhiro Furukawa, Osamu Watanabe, Takafumi Ando, Hidemi Goto, Nagoya Univ. School of Medicine (Japan); Kensaku Mori, Nagoya Univ. (Japan) . . . . [7963-49]

10:50 am: **3D supine and prone colon registration for computed tomographic colonography scans based on graph matching**, Shijun Wang, National Institutes of Health (USA); Nicholas A. Petrick, U.S. Food and Drug Administration (USA); Robert L. Van Uitert, Senthil Periaswamy, iCAD, Inc. (USA); Ronald M. Summers, National Institutes of Health (USA) . . . . [7963-50]

11:10 am: **Computer-aided teniae coli detection using height maps from computed tomographic colonography images**, Zhuoshi Wei, Jianhua Yao, Shijun Wang, Ronald M. Summers, National Institutes of Health (USA) . . . . [7963-51]

11:30 am: **Temporal volume flow: an approach to tracking failure recovery**, Jianfei Liu, Kalpathi R. Subramanian, The Univ. of North Carolina at Charlotte (USA); Terry S. Yoo, National Institutes of Health (USA) . . . . [7963-52]

11:50 am: **On-the-fly detection of images with gastritis aspects in magnetically-guided capsule endoscopy**, Philip W. Mewes, Siemens Medical Solutions GmbH (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Dominik Neumann, Aleksandar L. Juloski, Siemens Medical Solutions GmbH (Germany); Elli Angelopoulou, Joachim Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) . . . . [7963-53]

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

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SESSION 6
Room: Monterey 1-3 .Thurs. 10:10 am to 12:10 pm

Image Display and Presentation
Session Chair: **Claudia R. Mello-Thoms**, Univ. of Pittsburgh Cancer Institute

10:10 am: **Validation of a new digital breast tomosynthesis medical display**, Cédric Marchessoux, Barco N.V. (Belgium); Nicolas Vivien, Univ. de Poitiers (France); Asli Kumcu, Tom R. Kimpe, Barco N.V. (Belgium) . . . . [7966-26]

10:30 am: **Is image manipulation necessary to interpret digital mammographic images efficiently?**, Yan Chen, Alastair G. Gale, Loughborough Univ. (UK); Jonathan H. James, Nottingham City Hospital (UK); Anne Turnbull, Royal Derby Hospital (UK). . . . [7966-27]

10:50 am: **Performance evaluation of medical LCD displays using 3D channelized Hotelling observers**, Ljiljana Plati?a, Univ. Gent (Belgium); Cédric Marchessoux, Barco N.V. (Belgium); Bart Goossens, Wilfried R. Philips, Univ. Gent (Belgium) . . . . . [7966-28]

11:10 am: **Visual cues do not improve skin lesion ABC(D) grading**, Matteo Zanotto, Lucia Ballerini, Ben Aldridge, Robert B. Fisher, Jonathan Rees, The Univ. of Edinburgh (UK) . . . . [7966-29]

11:30 am: **The effect of defect cluster size and interpolation on radiographic image quality**, Karin Töpfer, Kwok L. Yip, Carestream Health, Inc. (USA) . . . . [7966-30]

11:50 am: **Verification of the QUBYX perfectlum calibration software using a PR-670 spectro radiometer and associated color management and verification facility**, Hans Roehrig, Syed F. Hashmi, The Univ. of Arizona (USA) . . . . [7966-31]

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

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SESSION 4
Room: Fiesta 8-10. . . . . Thurs. 10:10 to 11:30 am

Imaging Informatics-based Therapeutic Applications and Decision Support
Session Chair: **Maria Y. Y. Law**, The Hong Kong Polytechnic Univ. (Hong Kong, China)

10:10 am: **Evaluation of a stand-alone computer-aided detection system for acute intra-cranial hemorrhage in emergency environments**, James Reza F. Fernandez, Ruchi R. Deshpande, Jorge R. Documet, Margaret Liu, Brent J. Liu, The Univ. of Southern California (USA); Michael P. Brazaitis, Fletcher Munter, Walter Reed Army Medical Ctr. (USA) [7967-16]

10:30 am: **DICOM-based computer-aided evaluation of intensity modulated radiotherapy (IMRT) treatment plans**, Fion W. K. Cheung, Queen Elizabeth Hospital (Hong Kong, China); Maria Y. Y. Law, The Hong Kong Polytechnic Univ. (Hong Kong, China). . [7967-17]

10:50 am: **A multimedia ePR system to improve decision support in rehabilitation and performance through clinical gait and movement analysis**, Brent J. Liu, Jorge R. Documet, Sarah McNitt-Gray, Phil Requejo, Jill McNitt-Gray, The Univ. of Southern California (USA) . . . . [7967-18]

11:10 am: **Evaluation of an automatic multiple sclerosis lesion quantification tool in an informatics-based MS e-folder system**, Kevin C. Ma, James Reza F. Fernandez, Lilyana Amezcua, Alex Lerner, Brent J. Liu, The Univ. of Southern California (USA) . . [7967-19]

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

Conference 7963 continued
Computer-Aided Diagnosis

Room: Fiesta 1-3

SESSION 11
Room: Fiesta 1-3. . . . . . . Thurs. 1:20 to 3:00 pm

Breast Imaging III

Session Chair: **Nico Karssemeijer,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands)

1:20 pm: **Multiscale quantification of tissue spiculation and distortion for detection of architectural distortion and spiculated mass in mammography**, Zhiqiang Lao, Carestream Health, Inc. (USA); Xin Zheng, Nanjing Univ. (China) . . . . . [7963-54]

1:40 pm: **Computer aided detection of breast masses in mammography using support vector machine classification**, Jan M. Lesniak, ETH Zurich (Switzerland); Rianne Hupse, Michiel G. Kallenberg, Maurice R. Samulski, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Rémi Blanc, ETH Zurich (Switzerland); Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Gàbor Székely, ETH Zurich (Switzerland). . . . . [7963-55]

2:00 pm: **Computerized prediction of breast cancer risk: comparison between the global and local bilateral mammographic tissue asymmetry**, Xingwei Wang, Dror Lederman, Jun Tan, Xiao-Hui Wang, Bin Zheng, Univ. of Pittsburgh Medical Ctr. (USA) [7963-56]

2:20 pm: **A comparison study of textural features between FFDM and film mammogram images**, Hao Jing, Yongyi Yang, Miles N. Wernick, Illinois Institute of Technology (USA); Robert M. Nishikawa, The Univ. of Chicago (USA). . . . . [7963-57]

2:40 pm: **Mammographic parenchymal texture as an imaging marker of hormonal activity: a comparative study between pre- and post-menopausal women**, Dania Daye, Ezra Bobo, Bethany Baumann, Antonios Ioannou, Emily Conant, Andrew D. Maidment, Despina Kontos, The Univ. of Pennsylvania Health System (USA) . . . . [7963-58]

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

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment

Room: Monterey 1-3

SESSION 7
Room: Monterey 1-3. . . . . Thurs. 1:20 to 3:00 pm

Vision in Medical Imaging:

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

1:20 pm: **A study of attentional effects of intensity transforms for mammograms**, Anthony J. Maeder, Univ. of Western Sydney (Australia) . . . . [7966-32]

1:40 pm: **The impact of clinical indications on visual search behaviour in skeletal radiographs**, Adrian Rutledge, Mark F. McEntee, Louise A. Rainford, Michael J. O'Grady, Kevin McCarthy, Marie-Louise Butler, Univ. College Dublin (Ireland) . . . . [7966-33]

2:00 pm: **Measurement of breast lesion display luminance and overall image display luminance relative to optimum luminance for contrast perception**, Mohammad A. Rawashdeh, Warwick Lee, Patrick C. Brennan, Warren Reed, Mark F. McEntee, Roger Bourne, The Univ. of Sydney (Australia) [7966-34]

2:20 pm: **Motion perception in medical imaging**, Francesc Massanes, Jovan G. Brankov, Illinois Institute of Technology (USA) . . . . [7966-35]

2:40 pm: **Characterizing non-Gaussian properties of breast images with a noisy-Laplacian distribution**, Craig K. Abbey, Univ. of California, Santa Barbara (USA) and Univ. of California, Davis (USA); Anita Nosratieh, UC Davis Medical Ctr. (USA); Sheng Zhang, Miguel P. Eckstein, Univ. of California, Santa Barbara (USA); John M. Boone, UC Davis Medical Ctr. (USA) . . . . . [7966-36]

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

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications

Room: Fiesta 8-10

SESSION 5
Room: Fiesta 8-10. . . . . . Thurs. 1:20 to 2:40 pm

Advanced PACS-based Workflow

Session Chair: **Khan M. Siddiqui,** Microsoft Corp.

1:20 pm: **The role of GPU computing in medical image analysis and visualization**, Supratik K. Moulik, Univ. of Pennsylvania (USA) . . . . [7967-20]

1:40 pm: **Open source tools for standardized privacy protection of medical images**, Chung-Yueh Lien, National Yang Ming Univ. (Taiwan); Michael Onken, Marco Eichelberg, OFFIS e.V. (Germany); Tsair Kao, Hung Kuang Univ. (Taiwan). . . . . [7967-21]

2:00 pm: **2D versus 3D mammography observer study**, James Reza F. Fernandez, Ellen Messer, Ruchi R. Deshpande, Linda Hovanessian-Larsen, Brent J. Liu, The Univ. of Southern California (USA) . . . . . . [7967-22]

2:20 pm: **Efficient access to compressed 3D and 4D MRI using JPEG2000**, Tatiana Noreña Ospina, Univ. Nacional de Colombia (Colombia); Marcela Iregui, Univ. Militar Nueva Granada (Colombia); Jorge Victorino, Eduardo Romero Castro M.D., Univ. Nacional de Colombia (Colombia). [7967-23]

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

Conference 7963 continued
Computer-Aided Diagnosis

Room: Fiesta 1-3

SESSION 12
Room: Fiesta 1-3 . . . . Thurs. 3:30 to 5:30 pm

Lung Imaging

Session Chair: **Jong-Hyo Kim,** Seoul National Univ. College of Medicine (Korea, Republic of)

3:30 pm: **Classification of pulmonary emphysema from chest CT scans using integral geometry descriptors**, Eva M. van Rikxoort, Jonathan G. Goldin, Maya Galperin-Aizenberg, Matthew S. Brown, Univ. of California, Los Angeles (USA) . . . . [7963-59]

3:50 pm: **Lung partitioning for x-ray CAD applications**, Pavan Annangi, GE Global Research (India); Anand Raja, The Pennsylvania State Univ. (USA) . . . . [7963-60]

4:10 pm: **Estimating local scaling properties for the classification of interstitial lung disease patterns**, Markus B. Huber, Mahesh B. Nagarajan, Univ. of Rochester (USA); Gerda Leinsinger, Ludwig-Maximilians-Univ. München (Germany); Lawrence A. Ray, Carestream Health, Inc. (USA); Axel Wismueller, Univ. of Rochester (USA). . . . . [7963-61]

4:30 pm: **High-throughput morphometric analysis of pulmonary airways in MSCT via a mixed 3D/2D approach**, Margarete Ortner, Catalin Fetita, TELECOM SudParis, Institut TELECOM (France) and MAP5, CNR UMR145 (France); Pierre-Yves Brillet, Avicenne Hospital (France); Philippe A. Grenier, Pitié-Salpêtrière Hospital (France); Françoise J. Prêteux, TELECOM & Management SudParis (France) . . . . [7963-62]

4:50 pm: **Interactive lung lobe segmentation and correction in tomographic images**, Bianca Lassen, Jan-Martin Kuhnigk, Fraunhofer MEVIS (Germany); Eva M. van Rikxoort, ISI, Utrecht (Netherlands) and Univ. of California, Los Angeles (USA); Heinz-Otto Peitgen, Fraunhofer MEVIS (Germany) . . . . [7963-63]

5:10 pm: **Enhancing image classification models with multimodal biomarkers**, Jesus J. Caban, David Liao, Jianhua Yao, Daniel J. Mollura, Bernadette Gochuico, Terry S. Yoo, National Institutes of Health (USA) . . . . [7963-64]

Conference 7966 continued
Image Perception, Observer Performance, and Technology Assessment

Room: Monterey 1-3

SESSION 8
Room: Monterey 1-3 . . . . . Thurs. 3:30 to 5:30 pm

Technology Assessment and Impact

Session Chair: **David J. Manning,** Lancaster Univ. (UK)

3:30 pm: **Improved implementation of the abnormality manipulation software tools**, Mark T. Madsen, Kevin S. Berbaum, Kevin M. Schartz, Robert T. Caldwell, The Univ. of Iowa Hospitals and Clinics (USA) . . . . [7966-37]

3:50 pm: **A clinical image preference study comparing digital tomosynthesis with digital radiography for pediatric spinal imaging**, Jenna King, CancerCare Manitoba (Canada); Idris A. Elbakri, CancerCare Manitoba (Canada) and Univ. of Manitoba (Canada); Martin H. Reed M.D., Jens Wrogemann, The Children's Hospital of Winnipeg (Canada) . . . [7966-38]

4:10 pm: **Computer-aided detection as a decision assistant in chest radiography**, Maurice R. Samulski, Peter R. Snoeren, Bram Platel, Bram van Ginneken, Laurens E. Hogeweg, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); Cornelia M. Schaefer-Prokop M.D., Meander Medisch Centrum (Netherlands); Nico Karssemeijer, Radboud Univ. Nijmegen Medical Ctr. (Netherlands) . . . . [7966-39]

4:30 pm: **Does stereo-endoscopy improve neurosurgical targeting in 3rd ventriculostomy?**, Kamyar Abhari, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada); Sandrine de Ribaupierre, The Univ. of Western Ontario (Canada); Terry M. Peters, Roy A. Eagleson, Robarts Research Institute (Canada) and The Univ. of Western Ontario (Canada) . . . . [7966-40]

4:50 pm: **An analysis of the impact of tumor amount on the predictive power of a prostate biopsy prognostic assay**, Faisal M. Khan, Stephen Fogarasi, Douglas Powell, Gerardo Fernandez M.D., Ricardo Mesa-Tejada, Michael J. Donovan, Aureon Biosciences, Inc. (USA). . . . . [7966-41]

5:10 pm: **Quantitative assurance of optical image quality of rigid endoscopes, results from five years clinical experience**, Herke J. Noordmans, Rens Wientjes, Wiljan Mulder, Hoessin Belkadi, Henk van den Brink, Univ. Medical Ctr. Utrecht (Netherlands) . . . . [7966-42]

Conference 7967 continued
Advanced PACS-based Imaging Informatics & Therapeutic Applications

Room: Fiesta 8-10

SESSION 6
Room: Fiesta 8-10 . . . . . . Thurs. 3:30 to 5:30 pm

System Integration and Visualization II: Large-scale Collaborations and Open Standards

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

3:30 pm: **IHE for surgery: scope and first proposals for a new domain within the 'integrating the healthcare enterprise' initiative**, Oliver Burgert, Philipp Liebmann, Thomas Treichel, Univ. Leipzig (Germany) . . . . [7967-24]

3:50 pm: **XDS in healthcare, could it lead to a duplication problem?: empirical study from VGR Sweden**, Mikael Wintell, Sahlgrenska Univ. Hospital (Sweden); Nina Lundberg, Karolinska Institutet (Sweden); Lars Lindskold, Västra Götaland (Sweden) . . . . [7967-25]
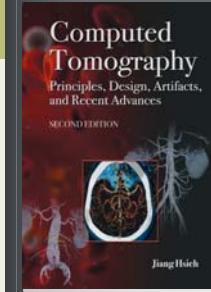
4:10 pm: **Design of image sharing and exchanging for cross-enterprise and cross-domain collaborative healthcare in Shanghai**, Jianguo Zhang, Kai Zhang, Yuanyuan Yang, Jianyong Sun, Tonghui Ling, Shanghai Institute of Technical Physics (China); Guanrong Wang, Healthcare Dept. of Zhabei District (China); Guangjun Yu, Shanghai Shen-Kang Hospital Management Ctr. (China); Xichuan Zheng, Shanghai Sixth People's Hospital (China); Jie Feng, HuaDong Hospital (China); Yingjie Wang, Wanda Information Technology Corp. (China) . . . . [7967-26]

4:30 pm: **Design and evaluation of web-based image transmission and display with different protocols**, Bin Tan, Shanghai Institute of Technical Physics (China); Kuangyi Chen, Univ. of California, Los Angeles (USA); Jianyong Sun, Shanghai Institute of Technical Physics (China); Xichuan Zheng, Shanghai Sixth People's Hospital (China); Jianguo Zhang, Shanghai Institute of Technical Physics (China) . . . . [7967-27]

4:50 pm: **Integration of DICOM and openEHR standards**, Ying Wang, Tongji Univ. (China); Zhihong Yao, Shanghai Institute of Biological Sciences (China); Lei Liu, Shanghai Ctr. for BioInformation Technology (China) . . . . [7967-28]

5:10 pm: **DICOM involving XML Path-Tag**, Qiang Zeng, Tongji Univ. (China); Lei Liu, Tongji Univ. (China) and Shanghai Ctr. for Bioinformation Technology (China); Zhihong Yao, Shanghai Institute of Biological Sciences (China) . . . . [7967-29]
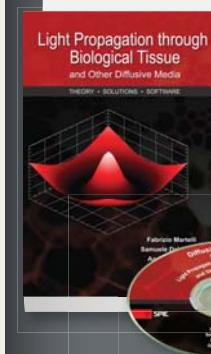
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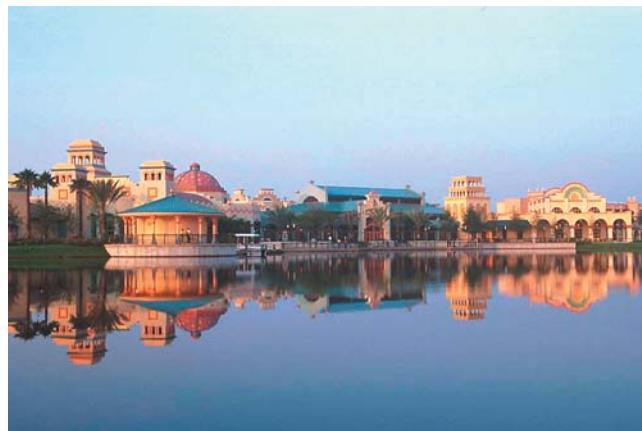
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SPIE Medical Imaging

Conference Dates

12-17 February 2011

Disney's Coronado Springs Resort

Lake Buena Vista

(Orlando Area), Florida, USA

Registration

Onsite Registration Hours

South Registration Counter

Saturday 12 February . . . . 7:30 am to 4:00 pm
Sunday 13 February . . . . 7:15 am to 4:00 pm
Monday 14 February . . . . 7:30 am to 4:00 pm
Tuesday 15 February. . . . . 7:30 am to 4:00 pm
Wednesday 16 February . . . . 7:30 am to 4:00 pm
Thursday 17 February . . . . 7:30 am to 1:30 pm

Full Conference Registration Includes:
- Choice of conference proceedings: CD-ROM or Printed
- Access to all presentations, panel discussions, and technical events
- Access to the poster sessions
- Poster Receptions and coffee breaks
- Hosted Lunches (Sunday–Thursday)
- Student Lunches (Monday–Wednesday)
- Courses are not included.

Course Registration

Courses are priced separately. Course-only registration includes your selected course(s), course notes, and coffee breaks.

Course Materials Desk

Location: South Registration Counter

SPIE Registration Area

Open during Registration hours

If you have registered to attend a course, please stop by the Registration Desk AFTER you pick up your badge. Your badge kit will include a course ticket allowing you to obtain your course notes.

SPIE Receipts, Badge Corrections, Cashier

Location: South Registration Counter

Receipts - Preregistered attendees who did not receive a receipt prior to the meeting may obtain a new copy of their registration receipt onsite at the SPIE Registration Desk.

Badge Corrections - Attendees who need a correction to their badge information onsite may do so at the SPIE Registration Desk. Please have your badge removed from the badge holder, marked with your changes, and ready to hand to the attendant upon approaching the counter.

Cashier Station - If you are paying by cash or check as part of your onsite registration, wish to add a course, workshop, or special event requiring payment, or have questions regarding your registration, please see the onsite cashier at the Cashier station in the registration area.

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Internet Pavilion

Fiesta 7
Sunday . . . . Noon to 9:00 pm
Monday through Wednesday . . . . 7:00 am to 9:00 pm
Thursday . . . . 7:00 am to 1:30 pm

The Pavilion will be equipped with multiple workstations allowing attendees to access their internet email during the conference and several Ethernet connections to use with your personal laptop. There will be a 10-minute time limit per each person's internet session.

Internet Wireless Access

Guest rooms at The Coronado Springs Resort are equipped with high-speed wireless Internet, complimentary to all SPIE Medical Imaging attendees.

Properly secure your computer before accessing the public network. Failure to do so may allow unauthorized access to your laptop as well as potentially introduce viruses to your computer and presentation. Wireless access is not available outside of the guest rooms. See internet pavilion hours above.

Author/Presenter Information

Speaker Check-in Desk/Audiovisual Preview Station

Location: Yucatan 3
Saturday . . . . 1:00 to 5:00 pm
Sunday through Thursday . . . . 7:30 am to 5:00 pm

Please note: The process for saving your presentation at Medical Imaging has changed.

As of 1 January 2011, you will need to load your presentation directly to the computer in the meeting room you will be presenting in, on the day of your talk. Presentations will no longer be loaded remotely to each meeting room.

It is still recommended to check your presentation at the Speaker Check-In/ Audiovisual Help Desk before your talk.

Poster Sessions

Location: Veracruz C

Sunday/Monday Poster Session
Poster presentations from the Image Processing; Visualization, Image-guided Procedures, and Modeling; Biomedical Applications in Molecular, Structural, and Functional Imaging; and Ultrasonic Imaging and Signal Processing conferences will be included.

Author Set-Up Time. . . . . .Sunday from Noon to 1:30 pm
Posters should remain on display until the end of the Interactive Poster Session on Monday.

Interactive Poster Session . . . . . Monday from 5:00 to 6:30 pm

Tuesday/Wednesday Poster Session
Poster presentations from the Physics of Medical Imaging; Computer-Aided Diagnosis; Image Perception, Observer Performance, and Technology Assessment; Advanced PACS-based Imaging Informatics and Therapeutic Applications conferences will be included.

Author Set-Up Time. . . . . Tuesday from 9:40 to 10:10 am
Posters should remain on display until the end of the interactive poster session on Wednesday.

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

NOTE: Posters must be on display by the start of the Interactive Poster Session to be considered presented. Posters not displayed at the suggested set-up times may not be considered for a poster award.

Poster Viewing Times: Posters may be viewed after set-up until 9:00 pm on session days. The poster area will be closed one hour prior to the poster receptions to prepare the food service.

Poster Removal: Papers not removed before 9:00 pm following the Interactive Poster Session will be considered UNWANTED and will be discarded. SPIE assumes no responsibility for posters left on the poster boards at the conclusion of poster sessions.

Business Services

Business Center

Location: Convention Center, Northwest end by Acapulco Room

The business center can make copies, print documents from your laptop or storage device, and provides small package Fedex shipping, packing supplies, color copying services, fax services and office supplies. Prices for services are posted onsite.

Message Center

Call Disney's Coronado Springs Resort at **407-309-7873**. Urgent messages only will be taken during registration hours Saturday through Thursday. Please check the message board near SPIE Registration daily to receive your urgent messages.

Child Care Services

Kid's Nite Out provides in-room childcare at many Orlando area hotels and resorts and is the preferred childcare provider of the Walt Disney World Resort. They care for children ages 6 weeks to 12 years. Call 1-800-696-8105 or kidsniteout.com

SPIE does not imply an endorsement or recommendation of this service. It is provided on an "information only" basis for your further analysis and decision. Other services may be available.

Food and Beverage Services

Coffee Breaks

Complimentary coffee will be served twice each day of the conference.

Saturday . . . . 10:00 am and 3:00 pm
Location: La Mesa Patio

Sunday - Wednesday . . . . 9:40 am and 3:00 pm
Location: Veracruz C

Thursday . . . . 9:40 am and 3:00 pm
Location: Fiesta Ballroom Foyer

Lunches

SPIE hosted lunches will be served Sunday through Thursday from 12:10 pm to 12:50 pm. Lunches will be served in the Convention Center Porte Cochére and Coronado J. Complimentary tickets for lunches will be included in registration packets for full-conference registrants.

Student attendees will receive a complimentary lunch ticket for Monday, Tuesday and Wednesday. Students may purchase lunch tickets from the cashier at the SPIE Registration Desk if tickets are available starting 10 minutes after the last conference room breaks, usually about 12:20-12:30pm. Attendees need to make their own lunch arrangements on Saturday.

Policies

Audio, Video, Digital Recording Policy

In the Meeting Rooms and Poster Sessions: For copyright reasons, recordings of any kind are strictly prohibited without prior written consent of the presenter in any conference session, course or of posters presented. Each presenter being taped must file a signed written consent form. Individuals not complying with this policy will be asked to leave a given session and asked to surrender their film or recording media. Consent forms are available at the SPIE Registration Desk.

Laser Pointer Safety Information

SPIE supplies tested and safety approved laser pointers for all conference meeting rooms, and for course rooms if instructors request one. For safety reasons, SPIE requests that presenters use our provided laser pointers available in each meeting room.

If using your personal laser pointer:
- Please have it tested at your facility to make sure it has <5 mW power output. Laser pointers in Class II and IIIa (<5 mW) are eye safe if power output is correct - but don't automatically trust the labeling. Commercially available laser pointers, red or green (or any color), could be incorrectly labeled as to their wavelength and power output.
- We require you to come to the Audiovisual Desk onsite and test your pointer on our power meter. If the pointer fails the safe power level you may not use the pointer at the conference. You will be required to sign a waiver releasing SPIE of any liability for use of potentially non-safe laser pointers.
- Use of a personal laser pointer at an SPIE event represents user's acceptance of liability for use of a non-SPIE supplied laser pointer device. Misuse of any laser pointer could lead to eye damage. In California, it is a criminal misdemeanor to shine a laser pointer at individuals "who perceive they are at risk."

Unsecured Items

Personal belongings such as briefcases, backpacks, coats, book bags, etc. should not be left unattended in meeting rooms or public areas. These items will be subject to removal by security upon discovery.

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Disney's Magical Express Transportation is available to help you reach your meeting destination stress-free and focused. Disney picks you up and takes you from Orlando International Airport to the Resort, while our "hands-free" luggage service delivers your bags from the plane directly to your room. Departing is also a breeze with in-hotel boarding pass service and return shuttle to Orlando International. Reservations are required.

Go to **spie.org/miprogram** hotel+travel pages for weblink.

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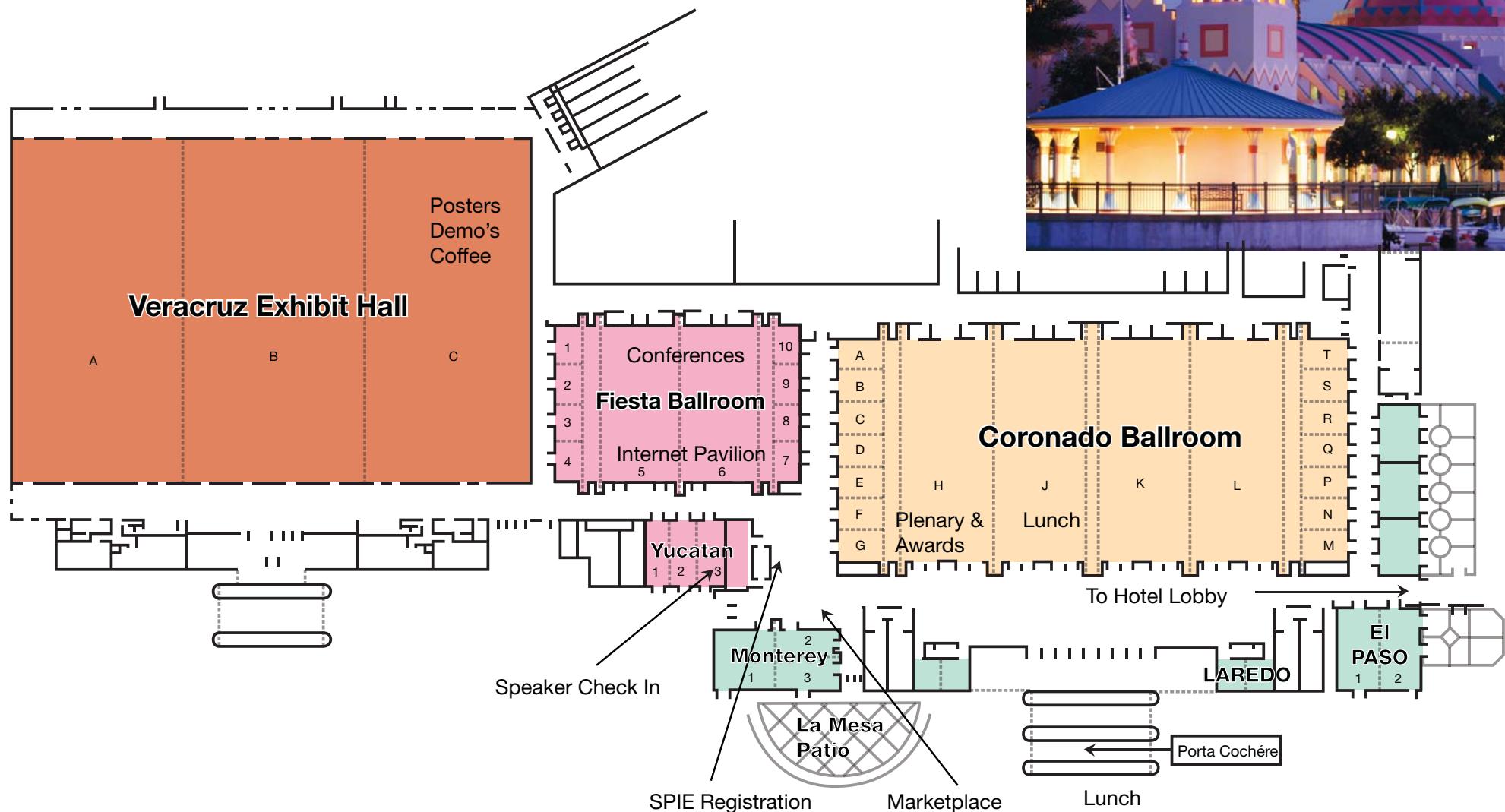
Hertz Car Rental has been selected as the official car rental agency for this conference. To reserve a car, identify yourself as an SPIE Medical Imaging Conference attendee using the Hertz Meeting Code CV# 029B0015. Note: When booking from International Hertz locations, the CV # must be entered with the letters CV before the number, i.e. CV029B0015

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Posters
Demo's
Coffee

Veracruz Exhibit Hall

A   B   C

Fiesta Ballroom

Conferences

Internet Pavilion

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Coronado Ballroom

A B C D E F G

Plenary & Awards

H J K L

Lunch

T S R Q P N M

Yucatan

1 2 3

Speaker Check In

Monterey

1 2 3

La Mesa Patio

To Hotel Lobby

LAREDO

El PASO

1 2

Porta Cochére

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Conference dates
4–9 February 2012
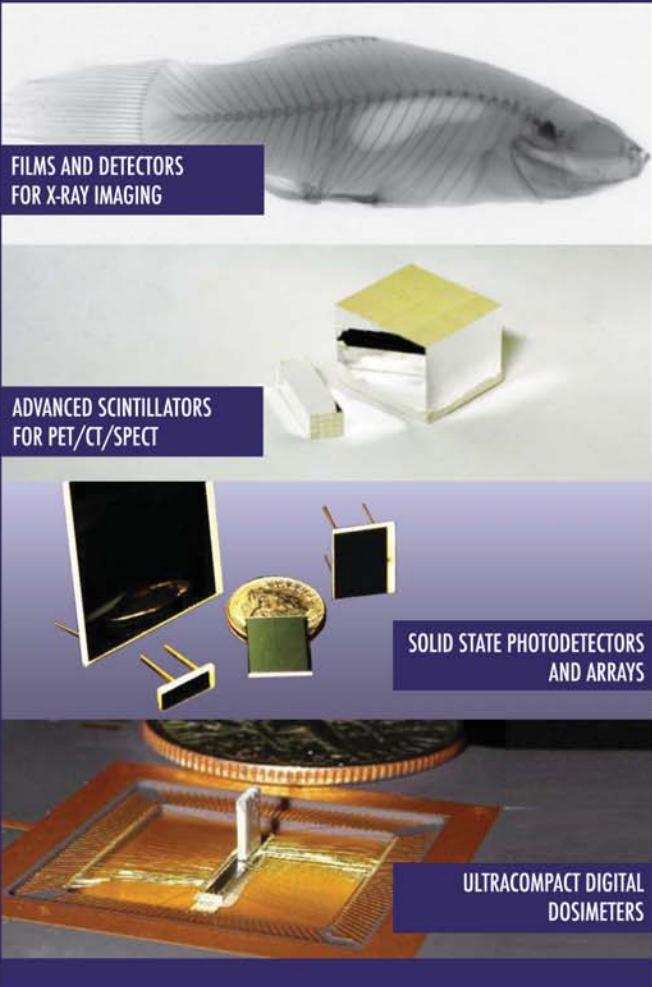
Technologies
- Physics of Medical Imaging
- Image Processing
- Computer-Aided Diagnosis
- Biomedical Applications in Imaging
- Image Perception, Observer Performance, Technology Assessment

- Advanced PACS-based Imaging Informatics
- Ultrasonic Imaging, Tomography, and Therapy
- Visualization, Image-guided Procedures, Modeling

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