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Conference Dates
12-17 February 2011
Disney’s Coronado Springs Resort
Lake Buena Vista
(Orlando Area), Florida, USA

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

Call for Papers
Submit your abstract by 2 August 2010

This program is current as of 1 May 2010. Please visit spie.org/micall for event updates.
SPIE Medical Imaging—Back in Florida for 2011

SPIE Medical Imaging is the premier annual meeting on the scientific and technical aspects of medical imaging. There are eight conferences covering all aspects of medical imaging technologies: physics, image processing, CAD, visualization and modeling, PACS, perception, ultrasonic imaging, biomedical research, and more.

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2011 Call for Papers
Submit your abstract by 2 August 2010

Conferences and Courses: 12–17 February 2011
Disney’s Coronado Springs Resort
Lake Buena Vista (Orlando Area), Florida, USA

spie.org/micall
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“Premier meeting for image-guided interventions. It gives me the chance to interact with many colleagues and present early-stage work.”

“It is the best, broadest, and largest, in terms of attendance, technical meeting in medical imaging.”

“NIH reviewers are there. People who decide future directions of research are there. Potential customers are there.”

–SPIE Medical Imaging Attendees
Plan now to participate

SPIE Medical Imaging is the internationally recognized premier forum for reporting state-of-the-art research and development in medical imaging. We invite contributions in all aspects of the full range of medical imaging modalities, from the underlying fundamental scientific principles to clinical evaluations. The symposium covers a wide range of topics on medical image acquisition, display, processing, understanding, perception, storage, and transmission, including:

- imaging physics, systems analysis and modeling
- emerging image acquisition technologies
- molecular imaging
- quantitative imaging
- tomographic image reconstruction
- ultrasonic acquisition and processing technologies
- magnetic resonance imaging (MRI)
- X-ray computed tomography
- PET, SPECT and hybrid acquisition systems
- image processing and analysis
- computer-aided detection and diagnosis
- quantitative-based image analysis and interpretation
- computational models
- image-guided therapies
- visual rendering of complex datasets
- visual perception and observer performance
- physiological and functional interpretation of image data
- clinical evaluations of new technologies
- image data management (storage, retrieval, transmission)
- medical informatics.

We encourage contributions from you and your colleagues.

The SPIE copyright policy grants authors the right to submit their Medical Imaging Proceedings papers to peer-reviewed journals or magazines of their choice.

2011 Symposium Organizers:

Maryellen Giger  
The Univ. of Chicago

Joseph M. Reinhardt  
The Univ. of Iowa
All-Conference Plenary Session
Monday 14 February 2011

The Expanding Role of Physics and Engineering in Medical Imaging

William Hendee
Professor of Radiology, Radiation Oncology, Biophysics and Population Health
Medical College of Wisconsin

William R. Hendee retired in 2006 as dean of the Graduate School of Biomedical Sciences at the Medical College of Wisconsin in order to devote more time to editing a leading scientific journal.

William R. Hendee, PhD, was President of the MCW Research Foundation and Dean of the College’s Graduate School of Biomedical Sciences and received the American Roentgen Ray Society’s (ARRS) 2005 Gold Medal for Distinguished Service to Radiology. Dr. Hendee came to the Medical College of Wisconsin in 1991 from the American Medical Association, where he was vice president for science and technology.

Dr. Hendee was also a Professor in the Medical College’s Health Policy Institute (Bioethics) and the Departments of Radiation Oncology, Biophysics and of Radiology, and is Vice Chairman for Research in Radiology.

He is an internationally renowned radiation physicist, and has held unique positions in radiology and nuclear medicine usually held only by physicians. This includes serving as Chairman of Radiology at the University of Colorado and as the first non-physician president of the American Board of Radiology (2002-2004). He is also a representative from Radiology to the American Board of Medical Specialties.

He has authored or co-authored more than 370 scientific articles and 25 books, and is editor of Medical Physics, a leading journal of biophysics. His research focus is on diagnostic imaging, with an emphasis on visual perception and cognition, and on technology assessment in medicine.

Dr. Hendee was awarded his PhD in physics from the University of Texas Southwestern Medical Center in Dallas. He received his undergraduate degree from Millsaps College in Jackson, Miss., where he was subsequently awarded an honorary doctorate in science.
This conference will cover all aspects of image formation in medical imaging including systems using ionizing radiation (x-rays, gamma rays) or non-ionizing techniques (ultrasound, optical, thermal, magnetic resonance, or magnetic particle imaging). Papers of a theoretical nature or papers reporting new experimental results are invited. Topics of particular interest include experimental methods and results of image performance, image reconstruction, detector materials and electronic design, analytical and computer modeling of imaging systems, and novel methods for image formation. The conference will cover predicted and measured system performance including image noise and contrast, spatial and temporal resolution, and inherent artifacts. Systems of interest include those producing projection, tomographic, volumetric, dynamic, or time resolved studies along with systems using specialized approaches for depth or tissue discrimination. Work directed towards the imaging of human subjects, small animals, or tissue specimens are welcome. Original papers are especially requested in the following areas:

**Imaging Science**
- Physics of signal detection and image formation
- Object characterization and contrast mechanisms
- Characterization of detector and system performance (MTF, NPS, DQE, observer-based)

**Technology**
- Novel medical imaging systems and methods
- Properties of scintillating, photoconductive, or other sensor materials
- Novel sources of radiation
- Image reconstruction methods (e.g., for CT, tomosynthesis, optical imaging, MRI, etc.)
- Multi-energy (spectral) x-ray and CT imaging
- Computer simulation of imaging systems including models for radiation sources, imaged objects, Physical interactions, and detectors
- Radiation (e.g., optical) and signal transport
- Radiatiion dose, dosimetry, and dose effects

**Devices and Applications**
- Advanced multi-slice or cone beam CT systems
- Advanced radiographic, fluoroscopic, or angiographic systems
- Advanced applications (clinical, translational, preclinical, basic science, biomarkers)
- Non-ionizing radiation systems (ultrasound, MRI, optical, thermal, magnetic particle imaging)
- Small animal imaging systems
- Megavoltage imaging devices
- Multi-modality imaging devices
- Low-cost imaging devices with global health applications
- Imaging applications in therapy (e.g., radiation therapy, surgery, interventions)

**TOPIC AREAS: For this conference only**

During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.

- ALG - Algorithmic developments, simulations, calibration, classification, etc. (for CT and tomosynthesis reconstruction use dedicated categories)
- APPS - Applications, e.g. cardiovascular, oncology, image guided interventions (for breast imaging use dedicated category)
- CT - All conventional CT topics (for reconstruction, cone beam, and multi-energy use dedicated category)
- CTCB - Cone beam CT
- CTME - Multi-energy CT
- CTREC - CT image reconstruction
- DET - Detector technology; scintillators, photoconductors, diodes, TFT
- DOSE - radiation dose, dosimetry, and dose effects
- MAM - Imaging of the breast (any device)
- METR - Measurement methods (MTF, NPS, DQE, eDQE, gDQE, Spectra, ...)
- MICRO - Devices/techniques for microscopic or small animal imaging
- IMG - Imaging methods including optical, MR, nuclear, etc. (for x-ray based methods use dedicated categories)
- PER - Observer or perception-based performance evaluations of systems
- PHT - Work involving development of phantoms or anatomical simulation models
- RECON - Image reconstruction including CT, OCT, and tomosynthesis
- SYS - Reports on complete systems, prototypes, products
- TSY - Tomosynthesis (for tomosynthesis reconstruction use dedicated category)
- TSYREC - Tomosynthesis reconstruction
- XIM - X-ray imaging, x-ray sources, techniques, scatter (for detectors, mammography, and reconstruction use dedicated categories)
- XME - Multi-energy radiography or mammography (for CT use CTME instead)
- OTHER - Other technical areas
Call for Papers

Image Processing (MI102)

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

Program Committee: Kyongtae T. Bae, Univ. of Pittsburgh Medical Ctr. (USA); Christian Barillot, Institut de Recherche en Informatique et Systèmes Aléatoires (France); Baowei Fei, Emory Univ. (USA); Aaron Fenster, Robarts Research Institute (Canada); Bernd Fischer, Univ. zu Lübeck (Germany); Alejandro F. Frangi, Univ. Pompeu Fabra (Spain); Mona K. Garvin, The Univ. of Iowa (USA); James C. Gee, Univ. of Pennsylvania (USA); Guido Gerig, The Univ. of Utah (USA); Tianhu Lei, The Children's Hospital of Philadelphia (USA); Boudewijn P. F. Lelieveldt, Leids Univ. Medisch Ctr. (Netherlands); Boštjan Likar, Univ. of Ljubljana (Slovenia); Murray H. Loew, The George Washington Univ. (USA); Cristian Lorenz, Philips Reuken (Germany); Frederik Maes, Katholieke Univ. Leuven (Belgium); Vincent A. Magnotta, The Univ. of Iowa Hospitals and Clinics (USA); Sunanda D. Mitra, Texas Tech Univ. (USA); Kensaku Mori, Nagoya Univ. (Japan); Mads Nielsen, Univ. of Copenhagen (Denmark); Wiro J. Niessen, Erasmus MC (Netherlands); Sébastien Ourselin, Univ. College London (United Kingdom); Josien P. W. Pluim, Univ. Medical Ctr. Utrecht (Netherlands); Daniel Rueckert, Imperial College London (United Kingdom); Punam K. Saha, The Univ. of Iowa (USA); Olivier Salvador, Commonwealth Scientific and Industrial Research Organisation (Australia); Julia A. Schnabel, Univ. of Oxford (United Kingdom); Colin Studholme, Univ. of California, San Francisco (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA); Martin A. Styner, The Univ. of North Carolina at Chapel Hill (USA); Philippe Thévenaz, Ecole Polytechnique Fédérale de Lausanne (Switzerland); Jayaram K. Udupa, The Univ. of Pennsylvania Health System (USA); Andreas Wahle, The Univ. of Iowa (USA)

Original papers are invited on all aspects of the processing and analysis of medical, small animal, or cellular images, with applications in medicine, biological, and pharmaceutical research. Of interest are algorithms applied to all imaging modalities, including x-ray, CT, MRI, nuclear medicine, optical, ultrasound, macroscopic, and microscopic imaging. Papers typically involve research that includes one or more of the following categories (in alphabetical order):

Categories
- Atlases
- Active shape and appearance models
- Automated image analysis
- Classification
- Compression
- Deformable geometry
- Diffusion tensor imaging
- Functional imaging
- Image-guided therapy / intervention
- Image restoration and enhancement
- Mathematical morphology
- Motion analysis
- Multiresolution and wavelets
- Neural nets
- Pattern recognition
- Population studies
- Registration
- Segmentation
- Shape
- Statistical methods
- Texture
- Validation, including creation of ‘ground truth’ image repositories
- Voxel-based morphometry

TOPIC AREAS: For this conference only

During the submission process, you will be asked to choose no more than three topics from the list above to assist in the review process.

Please note that there is a 4-page limit for abstracts. Submissions exceeding the page limit will not be considered for review.

Critical Dates
Abstract Due Date: 2 August 2010
Post-Meeting Manuscript Due Date: 17 January 2011

Please Note: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a full-length manuscript for publication in the conference proceedings.
This conference will provide a forum for researchers involved in development and application of computer-aided diagnosis and detection systems. Original papers are requested on all aspects of CAD, including segmentation, pattern recognition, feature extraction, classifier design, workstation design, human interaction, database construction, and evaluation. Of interest are methods investigated for all medical imaging modalities, including x-ray, CT, MRI, nuclear medicine, molecular imaging, optical, ultrasound, endoscopy, macroscopic and microscopic imaging, and multi-modality technologies.

**CAD DEMONSTRATIONS:** A workshop with real-time demonstrations of CAD systems will be organized during the conference. This provides a unique opportunity for researchers to demonstrate their applications and get feedback from the audience. All participants of the meeting are invited to submit a proposal for a demonstration. More information will be provided at a later date.

**TOPIC AREAS:** For this conference only

During the submission process, you will be asked to choose no more than three topics (one Applications, and up to two others) from the following list to assist in the review process.

**Choose only one Applications topic.**
- Applications: Lung
- Applications: Breast
- Applications: Colon and other Gastrointestinal Tract
- Applications: Cardiovascular
- Applications: Oncology
- Applications: Eye (including retina)
- Applications: Head and Neck
- Applications: Musculoskeletal
- Applications: Multiple Organ Systems
- Applications: Microscopy
- Applications: Novel Applications
- Applications: Other Organ Systems

**Choose up to two topics from the following list:**
- Detection
- Characterization and Staging
- Machine Learning
- Classifier Design
- Risk Assessment
- CAD System Quality Assessment
- Segmentation
- False Positive Reduction
- Feature Extraction
- Quantitative Analysis
- Database Design
- Content-based Image Retrieval
- Reference Libraries
- Visualization and Interaction
- Validation
- Observer Studies
- Comparative Evaluation of Different CAD Systems
- Combining or Fusing Different CAD systems
- Other, please specify.
Visualization, Image-guided Procedures and Modeling (MI104)

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

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

This conference is primarily concerned with applications of medical imaging data in the engineering of therapeutic systems. Original papers are requested in the following topic areas:

• 3D visualization
• Augmented, virtual, and enhanced reality
• Image computing architecture
• Mathematical modeling to guide and understand therapy
• Techniques in population-specific and patient-specific model generation
• Image based models for characterization of tissue and disease properties
• Novel interfaces for therapy and visualization of data
• Image-guided procedures
• Minimally invasive surgery
• Computer-assisted therapy and therapy planning
• Image guided robotics and surgical tools
• Medical image based simulation
• Navigation systems
• Tracking and calibration
• Localization technologies
• Intraoperative imaging
• Intraoperative patient-to-image/-model registration
• Modeling of intraprocedural changes
• Validation/evaluation
• Telemedicine systems and their applications
• Clinical applications and technology integration
• Other related areas.

Papers from student authors are particularly encouraged; there is a competition for the best student paper and limited student travel awards are also available. Submissions that cross over between this conference and others at SPIE Medical Imaging, and which would be appropriate for combined sessions, are also welcomed.

TOPIC AREAS: For this conference only
During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.

• Abdominal Procedures
• Calibration
• Cardiac Procedures
• Pelvic Procedures
• Diagnosis
• Disease Characterization
• Localization and Tracking Technologies
• Endoscopic Procedures
• Enhanced Reality
• Image-Guided Therapy
• Data Integration for the Clinic/OR
• Intraoperative Imaging
• Medical Robotics
• Modeling
• Monitoring and Feedback
• Multimodality Display
• Neurosurgical Procedures
• Registration
• Segmentation
• Surgical Simulation
• Therapy Planning
• Treatment Planning
• Ultrasound Guidance
• Validation/Evaluation
• Visualization
• Human Factors
• Stereoscopic Display
• Other, please specify

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Biomedical Applications in Molecular, Structural, and Functional Imaging (MI105)

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

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

This conference will cover all aspects of measuring and quantifying molecular, structural and functional parameters from biomedical images. Descriptions of work based on any imaging technology, including multidimensional and multimodality, are invited. Techniques, methods, and systems for evaluation and interpretation of structure-function relationships and interrelationships from images of intact, living tissues, are of particular interest. Work in emerging areas such as novel contrast agents, small animal imaging, optical or electrical impedance tomography, and dual-modality imaging is also of specific interest.

Original papers are requested in, but not limited to, the following areas:
- Imaging methods
- Small animal imaging, molecular imaging
- NEW Magnetic particle imaging (MPI) and nanoparticle biosensors
- Optical, electrical impedance, terahertz or microwave imaging
- Novel physiological imaging agents/probes: quantum dots, nanoparticles, radiopharmaceuticals
- Pulmonary function: perfusion, ventilation, mechanics, and modeling
- Vessels and airways: detection, modeling, trees, reactivity
- Cardiac electrophysiology
- Functional neuro-imaging and brain mapping
- Soft tissue deformation: analysis and quantification
- Biomechanical structure and modeling: cardiac, orthopedic, finite-element models
- Physiologic modeling: metabolism, receptor-ligand binding
- Pharmacokinetic models.

TOPIC AREAS: For this conference only
During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.
- Physiological modeling/computational physiology
- Imaging methods
- Small-animal imaging
- Optical imaging
- Electrical impedance, terahertz or microwave imaging
- Imaging agents/molecular probes: receptor-ligand binding / pharmacokinetic models
- Nanoparticle imaging: sensing/therapy
- Neuro-imaging and brain mapping
- Soft tissue imaging
- Cardiac electrophysiology
- Detection, segmentation, mapping: vessels and airways
- Biomechanical modeling/structure
- Pulmonary function: perfusion, ventilation, mechanics, and modeling
- Other, please specify
Image Perception, Observer Performance, and Technology Assessment (MI106)

Conference Chairs: David J. Manning, Univ. of Cumbria, Lancaster (United Kingdom); Craig K. Abbey, Univ. of California, Santa Barbara (USA)

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

This conference focuses on a broad understanding of medical image perception, observer-performance measurement, and the application of these methods to evaluation of medical technology. Areas of traditional interest include, but are not limited to, optimizing image display and workstations, psycho-physical and vision-science based models of human observer performance, factors that affect the diagnostic process, eye-movement studies, observer performance methodologies, human CAD interaction, optimal decision-making strategies, statistical models for evaluation of observer performance, and observer variability assessment.

Original papers and posters are requested in the following areas:
• Diagnostic-performance evaluation methodologies (ROC, FROC, LROC, and alternatives)
• Observer performance evaluation of new technologies (CAD, AMLCDS, etc)
• Cognitive aspects of image perception
• Factors that influence diagnostic performance
• Perceptual factors in diagnostic workstation design and perceptually optimized displays
• Perceptual and performance issues in new modalities (e.g., teleradiology and telemedicine)
• Models of detection, discrimination, and localization
• The nature of reader expertise
• Sources of observer variance

KEYWORDS: For this conference only
To assist the reviewers, choose up to five keywords in order of relevance from the following list.
• Image Display
• Image Perception
• Observer Performance Evaluation
• ROC Methodology
• Model Observers
• Technology Assessment
• Technology Impact
• Other (please specify).

Critical Dates
Abstract Due Date: 2 August 2010
Post-Meeting Manuscript Due Date: 17 January 2011

Please Note: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a full-length manuscript for publication in the conference proceedings.
Rapid developments in imaging and information technology have lead to significant changes in the design and implementation of Picture Archiving and Communication Systems (PACS) and image and healthcare information management systems. A stronger emphasis on systems integration, workflow and globalization of information management has lead to a need for more sophisticated imaging informatics techniques. In addition, the role of imaging informatics is bridging gaps between the diagnosis and treatment/therapy continuums. The conference will include, but is not necessarily limited to, the following general session topics:

**Systems Integration and Standards**
Integration of radiology-based imaging with the electronic medical record and multi-media information from other specialties can positively impact the diagnostic and treatment process but must meet the demands for enterprise-wide access and distribution of image-intensive data. In addition, enterprise-level PACS design and implementation, extending to all clinical areas and patient care settings can be achieved through the utilization of standards such as DICOM, HL7 along with the IHE initiatives. This section will also cover topics including Fault-Tolerance, Data Security, and Data Integrity. Research developed utilizing DICOM-SR and other Imaging Informatics standards (eg, XML, HTML, XDS, etc) will be covered within this session.

**Database, Knowledge, Search, and Data Mining Development**
Research in database development, database aggregation, and knowledge base will be covered along with data mining tools, such as CBIR methodologies, and the development of other tools to mine data. Medical Imaging search related topics including web, local, and image based search engines, indexing, ranking algorithms and NLP integration will be included. Also invited are research on business intelligence and data mining applications for quality and patient safety within imaging informatics including radiation dose monitoring and tracking, productivity and efficiency, and other performance metrics.

**Advanced PACS-based Radiology Workflow**
With the advent of thin-slice volumetric imaging, the need for research in more efficient methods to analyze and navigate through the crucial clinical data becomes more apparent. Clinical experiences, workflow issues, system performance, multimodality image display and navigation, and new intelligent display technologies will be discussed in this session.

**The Digital OR**
The operating room environment is one of today's application challenges in imaging informatics. In this session, topics covering Imaging Informatics within the surgical environment will be discussed. Other topics related to patient modeling, workflow modeling and infrastructure (eg, Therapy Imaging and Model Management System - TIMMS) will also be covered. In addition, research advancement related to the DICOM WG24 and utilization of DICOM surgery objects will be discussed.

**Therapeutic Applications and Extending Imaging Informatics beyond Radiology**
Other image-intensive therapeutic applications (eg, Radiation Therapy, Chemotherapy, Rehabilitation) will be discussed in this session. System integration within the Radiation Oncology department in addition to research advancement in the utilization of DICOM-RT objects will be covered. Advancements in system integration for Optical Imaging and Imaging in Pathology will be included in this session. Research involving the integration of multi-media data in new areas such as physical therapy and rehabilitation sciences are also included. Topics relating to research work performed based on DICOM WG26 are encouraged as well.

**Imaging Informatics in Translational Research**
This new session will discuss the extension of imaging informatics to translational research. Research advancements towards personalized medicine will be investigated from genomic-related Imaging Informatics to small animal imaging to functional and/or whole body imaging and any imaging informatics tools developed to link the fields of research.

**Imaging Informatics in Large-Scale Collaborations/Consortiums**
Imaging informatics research in large-scale initiatives such as the caBIG In Vivo Imaging Workspace, the RIDER consortium, and the LIDC provides a unique set of research challenges which will be discussed within this session. Other national and international imaging informatics collaborations/consortia are invited to present research work developed.

Papers on the technical and engineering aspects of the Transforming the Radiological Interpretation Process (TRIP) initiative being led by the Society for Imaging Informatics in Medicine (SIIM) are also welcome. Accepted presentations are also considered for invitation to peer-reviewed submission to the Journal of Digital Imaging.

**TOPIC AREAS: For this conference only**
During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.
- Systems Integration and Standards
- Database, Knowledge, Search, and Data Mining Development
- Advanced PACS-based Radiology Workflow
- The Digital OR
- Therapeutic Applications and Extending Imaging Informatics beyond Radiology
- Imaging Informatics in Translational Research
- Imaging Informatics in Large-Scale Collaborations/Consortiums
Ultrasonic Imaging, Tomography, and Therapy (MI108)

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

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

As previous years, this conference will provide a forum for in-depth discussion of all aspects related to medical ultrasound imaging: physics of ultrasound wave propagation, image reconstruction strategies, hardware and system design, new imaging modalities, contrast agents, biological and biomedical applications of new ultrasound modalities.

In addition, the 2011 conference will put special emphasis on bio-effects, bio-safety, and all aspects related to ultrasound therapy (guidance, monitoring, tissue ablation, drug and plasmid delivery using contrast, etc.).

The best papers submitted to the conference will be awarded and the authors will be given the opportunity to automatically submit their SPIE proceedings paper ‘as is’ to the IEEE Transactions on Medical Imaging for potential publication in this journal.

Finally, a joint session with the Visualization, Image-guided Procedures, and Modeling conference will be set up in order to have a high-level discussion on the state-of-the-art in ultrasound guidance of cardiac interventions.

As a world-expert in the field, Prof. Terry Peters, University of Western Ontario will give a keynote lecture on this topic during this session. As such, the unique character of the SPIE Medical Imaging symposium is underlined as it brings together experts of different societies and disciplines in one meeting.

TOPIC AREAS: For this conference only

During the submission process, you will be asked to choose no more than three topics from the following list to assist in the review process.

- Physics and computer simulation
- Transducers and beam forming
- Novel imaging approaches
- Ultrasound tomography
- Ultrasound bio-effects, safety
- Ultrasound therapy
- Motion and deformation estimation
- Contrast imaging
- Tissue characterization
- Optoacoustic imaging
- High frequency imaging
- New applications of ultrasound in medicine and biology
- Other, please specify

The submitted abstract should concisely describe the objective of the work, the methodology used, and the results. Each submitted abstract will be carefully reviewed and evaluated by the program committee for suitability of presentation.

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GOAL

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Each conference review committee recognizes a selected poster at the cum laude level for the best poster presentation in their conference.

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Segmentation of deformable organs from medical images using particle swarm optimization and nonlinear shape priors
Paper 7623-153
Authors: Ahmed Affi fi , Toshiya Nakaguchi, Norimichi Tsumura, Chiba Univ. (Japan)

Automatic estimation of breast density using a combined information of histogram statistics and boundary gradients
Paper 7624-87
Authors: Youngwoo Kim, Chang-Won Kim, Jong-Hyo Kim, Seoul Nat’l Univ. College of Medicine (Korea, Republic of)

Graphical user interfaces for simulation of brain deformation in image-guided neurosurgery
Paper 7625-114
Authors: Xiaoyao Fan, Songbai Ji, Pablo A. Valdes, Alex Hartov, Dartmouth College (USA); David W. Roberts, Dartmouth Hitchcock Medical Ctr. (USA); Keith D. Paulsen, Dartmouth College (USA)

Microscopic resolution imaging and proteomics correlation at histogeographically identical location: point by point correlation between ex vivo tissue imaging with high field MRI and multiplex tissue immunoblotting for proteomics profiling
Paper 7626-83
Authors: Kant M. Matsuda M.D., Joon-Yong Chung, National Cancer Institute/NIH (USA); Stephen J. Dodd, Masaki Fukunaga, National Institute of Neurological Disorders and Stroke/NIH (USA); Stephen M. Hewitt, National Cancer Institute/NIH (USA)

A support vector machine designed to identify breasts at high risk using multi-probe generated REIS signals: a preliminary assessment
Paper 7627-46
Authors: David Gur, Bin Zheng, Univ. of Pittsburgh (USA); Sreeram Dhurjaty, Dhurjaty Electronics Consulting LLC (USA); Dror Lederman, Jules H. Sumkin M.D., Margarita Zuley, Univ. of Pittsburgh (USA)

Data migration and persistence management in a medical imaging informatics data grid
Paper 7628-36
Author: Jasper Lee IV, The Univ. of Southern California (USA)

Detecting breast microcalcifications using super-resolution ultrasound imaging: a numerical phantom study
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Authors: Lianjie Huang, Los Alamos National Lab. (USA); Francesco Simonetti, Imperial College London (UK)
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Replace-approximation method for ambiguous solutions in factor analysis of ultrasonic hepatic perfusion...[7629-36]
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