



SPIE

2012 Medical Imaging

Call for Papers

Submit your abstract
by 25 July 2011



**Present your work to the leading
minds in the imaging community**

Location

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

Conference dates

4–9 February 2012

spie.org/micall

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
- Image-guided Procedures, Robotic Interventions, and Modeling

SPIE Medical Imaging



Present
your work at
the premier
forum for
these critical
technologies

SPIE Medical Imaging— Back in San Diego for 2012

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.

SPIE will advance your research globally

Your research will reach far beyond the conference room—all proceedings from Medical Imaging will be published in the SPIE Digital Library. Promote yourself, your ideas, and your organization to key researchers from around the world.



2012 Call for Papers

Submit your abstract by 25 July 2011

spie.org/micall

Conferences and Courses: 4–9 February 2012
San Diego, California, USA



• 23 monozygotic (MZ) + 23 dizygotic (DZ) same-sex twin pairs
 Centre for Magnetic Resonance, University of Queensland, Australia
 • The resemblance between twin pairs can be found from $det(J)$ using the intraclass correlation:

$$ICC = \frac{\sigma_b^2}{(\sigma_b^2 + \sigma_w^2)}$$

$$\sigma_b^2 \text{ and } \sigma_w^2 \text{ are the pooled variance between and within pairs, respectively}$$

CONTENTS

MI101	Physics of Medical Imaging (Pelc, Nishikawa)	3	MI107	Advanced PACS-based Imaging Informatics and Therapeutic Applications (Boonn, Liu)	9
MI102	Image Processing (Haynor, Ourselin)	4	MI108	Ultrasonic Imaging, Tomography, and Therapy (Bosch, Doyley)	10
MI103	Computer-Aided Diagnosis (van Ginneken, Novak)	5		Medical Imaging Sponsorships	11
MI104	Image-guided Procedures, Robotic Interventions, and Modeling (Holmes, Wong)	6		Poster Session and Student Paper Awards Criteria	12–13
MI105	Biomedical Applications in Molecular, Structural, and Functional Imaging (Molthen, Weaver)	7		General Information	14
MI106	Image Perception, Observer Performance, and Technology Assessment (Abbey, Mello-Thoms)	8		Abstract Submission	15

Cooperating Organizations

AAPM—American Association of Physicists in Medicine

APS—American Physiological Society

CARS—Computer Assisted Radiology and Surgery

MIPS—Medical Image Perception Society

RSNA—Radiological Society of North America

SIIM—Society for Imaging Informatics in Medicine

SMI—The Society for Molecular Imaging

The DICOM Standards Committee

Join the conversation—
and get the latest news on
SPIE Medical Imaging



#SPIEMI

spie.org/connect



Plan now to participate

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

- imaging physics, systems analysis and modeling
- emerging image acquisition technologies (e.g., electrical impedance imaging, microwave imaging, optical tomographic imaging)
- 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
- digital pathology.

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.

2012 Symposium Organizers:



Joseph M. Reinhardt
The Univ. of Iowa (USA)



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

Physics of Medical Imaging (MI101)

Conference Chairs: **Norbert J. Pelc**, Stanford Univ. (USA); **Robert M. Nishikawa**, The Univ. of Chicago (USA)
Cochair: **Bruce R. Whiting**, Washington Univ. in St. Louis (USA)

Program Committee: **Guang-Hong Chen**, Univ. of Wisconsin-Madison (USA); **Dianna D. Cody**, The Univ. of Texas M.D. Anderson Cancer Ctr. (USA); **Mats Danielsson**, Royal Institute of Technology (Sweden); **Maria Drangova**, Robarts Research Institute (Canada); **Thomas G. Flohr**, Siemens Medical Solutions GmbH (Germany); **Stephen J. Glick**, Univ. of Massachusetts Medical School (USA); **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 (USA); **Iacovos S. Kyprianou**, U.S. Food and Drug Administration (USA); **Joseph Y. Lo**, Duke Univ. Health System (USA); **Jinyi Qi**, Univ. of California, Davis (USA); **John A. Rowlands**, Thunder Bay Regional Health Sciences Ctr. (Canada); **John M. Sabol**, GE Healthcare (USA); **Taly G. Schmidt**, Marquette Univ. (USA); **Jeffrey H. Siewerdson**, The Johns Hopkins Univ. (USA); **Anders Tingberg**, Scania Univ. Hospital (Sweden); **John Yorkston**, Carestream Health Technology and Innovation Ctr. (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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
- Phantoms (physical and numerical)
- Radiation (e.g., optical) and signal transport
- Radiation dose, dosimetry, and dose effects

Devices and Applications

- Advanced multi-slice or cone beam CT systems
- Advanced radiographic, fluoroscopic, or angiographic systems (including phase contrast and diffraction)
- 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. Please select in order of importance.

- 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

SPIE Medical Imaging 2012

Image Processing (MI102)

Conference Chairs: **David R. Haynor**, Univ. of Washington (USA); **Sébastien Ourselin**, Univ. College London (United Kingdom)

Program Committee: **Mostafa Analoui**, The Livingston Group (USA); **Kyongtae T. Bae**, Univ. of Pittsburgh Medical Ctr. (USA); **Christian Barillot**, IRISA / INRIA Rennes (France); **Benoit M. Dawant**, Vanderbilt Univ. (USA); **Baowei Fei**, Emory Univ. (USA); **Aaron Fenster**, Roberts 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); **Tobias Heimann**, Deutsches Krebsforschungszentrum (Germany); **Bennett A. Landman**, Vanderbilt Univ. (USA); **Tianhu Lei**, The Children's Hospital of Philadelphia (USA); **Boudewijn Lelieveldt**, Leids Univ. Medisch Ctr. (Netherlands); **Boštjan Likar**, Univ. of Ljubljana (Slovenia); **Murray Loew**, The George Washington Univ. (USA); **Cristian Lorenz**, Philips Medizin Systeme GmbH (Germany); **Frederik Maes**, Katholieke Univ. Leuven (Belgium); **Vincent A. Magnotta**, The Univ. of Iowa Hospitals and Clinics (USA); **Sunanda D. Mitra**, Texas Tech Univ. (USA); **Kensaku Mori**, Nagoya Univ. (Japan); **Nassir Navab**, Technische Univ. München (Germany); **Mads Nielsen**, Univ. of Copenhagen (Denmark); **Wiro J. Niessen**, Erasmus MC (Netherlands); **Josien P. Pluim**, Univ. Medical Ctr. Utrecht (Netherlands); **Jerry Prince**, The Johns Hopkins Univ. (USA); **Daniel Rueckert**, Imperial College London (United Kingdom); **Punam K. Saha**, The Univ. of Iowa (USA); **Olivier Salvado**, 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 School of Medicine (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)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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, DSA, CT, MRI, nuclear medicine, optical, ultrasound, macroscopic, and microscopic imaging. Papers dealing with the challenges of bringing advances in research laboratories into clinical application are particularly welcomed.

New for 2012, image processing papers appropriate to a joint session (with Computer Aided Diagnosis) on digital pathology are also invited.

Papers typically involve research that includes one or more of the following categories (in alphabetical order):

Categories

- Analysis/processing of DTI, fMRI, connectivity data
- Atlases
- Active shape and appearance models, manifold learning
- Classification
- Compressive sensing/sparse reconstruction methods
- Deformable geometry

- Developments in open software for medical image processing and translational research
- Image compression
- Image computing for mobile devices
- Image restoration and enhancement
- Mathematical morphology
- Motion/time series analysis
- Multiresolution and wavelets
- Pattern recognition
- Population/clinical studies
- Registration
- Segmentation
- Shape
- Stereoscopic x-ray processing and visualization
- 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.

Critical Dates

Abstract Due Date: 25 July 2011
Post-Meeting Manuscript Due Date:
9 January 2012

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.

Computer-Aided Diagnosis (MI103)

Conference Chairs: **Bram van Ginneken**, Radboud Univ. Nijmegen (Netherlands); **Carol L. Novak**, Siemens Corporate Research (USA)

Program Committee: **Samuel G. Armato III**, The Univ. of Chicago (USA); **Susan Astley**, The Univ. of Manchester (United Kingdom); **Stephen Aylward**, Kitware, Inc. (USA); **Kyongtae T. Bae**, Univ. of Pittsburgh Medical Ctr. (USA); **Matthew S. Brown**, Univ. of California, Los Angeles (USA); **Heang-Ping Chan**, Univ. of Michigan Health System (USA); **Marleen de Bruijne**, Erasmus MC (Netherlands); **Thomas M. Deserno**, RWTH Aachen (Germany); **Catalin Fetita**, TELECOM & Management SudParis (France); **Hiroshi Fujita**, Gifu Univ. School of Medicine (Japan); **Maryellen L. Giger**, The Univ. of Chicago (USA); **Hayit Greenspan**, Tel Aviv Univ. (Israel); **Metin N. Gurcan**, The Ohio State Univ. Medical Ctr. (USA); **Lubomir M. Hadjiiski**, Univ. of Michigan Health System (USA); **Horst K. Hahn**, Fraunhofer MEVIS (Germany); **Jong-Hyo Kim**, Seoul National Univ. College of Medicine (Korea, Republic of); **Joseph Y. Lo**, Duke Univ. (USA); **Anant Madabhushi**, Rutgers, The State Univ. of New Jersey (USA); **Michael F. McNitt-Gray**, Univ. of California, Los Angeles (USA); **Kensaku Mori**, Nagoya Univ. (Japan); **Janne J. Nappi**, Massachusetts General Hospital (USA); **Meindert Niemeijer**, The Univ. of Iowa Hospitals and Clinics (USA); **Noboru Niki**, Univ. of Tokushima (Japan); **Nicholas A. Petrick**, U.S. Food and Drug Administration (USA); **Ronald M. Summers**, National Institutes of Health (USA); **Kenji Suzuki**, The Univ. of Chicago Medical Ctr. (USA); **Georgia D. Tourassi**, Duke Univ. (USA); **Rafael Wiemker**, Philips Research (Germany); **Axel Wismueller**, Univ. of Rochester Medical Ctr. (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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.

New for 2012, CAD papers appropriate to a joint session (with Image Processing) on digital pathology are also invited.

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 one or more applications topic from the following list:

- Applications: Breast
- Applications: (Cardio-)Vascular
- Applications: Colon and other Gastrointestinal Tract
- Applications: Eye (including retina)
- Applications: Head and Neck
- Applications: Liver
- Applications: Lung
- Applications: Microscopy and Histopathology
- Applications: Multiple Organ Systems
- Applications: Musculoskeletal
- Applications: Oncology
- Applications: Prostate
- 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

SPIE Medical Imaging 2012

Image-guided Procedures, Robotic Interventions, and Modeling (MI104)

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

Program Committee: **Purang Abolmaesumi**, The Univ. of British Columbia (Canada); **Wolfgang Birkfellner**, Medizinische Univ. Wien (Austria); **Kevin R. Cleary**, Children's National Medical Ctr. (USA); **Alexandre X. Falcão**, 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**, Robarts 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)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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
- 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
- Robotic interventions and surgical tools
- Medical image based simulation
- Localization technologies and navigation systems
- Tracking and calibration
- Intraoperative imaging
- Intraoperative patient-to-image/-model registration
- Modeling of intraprocedural changes
- Validation/evaluation
- Telemedicine systems and their applications
- Clinical applications and technology integration
- High performance computing for real-time modeling and/or large dataset visualization
- Modeling and analysis of procedures
- Safety and standards for image-guided and robotic procedures
- 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

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

Conference Chairs: **Robert C. Molthen**, Zablocki VA Medical Ctr. (USA); **John B. Weaver**, Dartmouth Hitchcock Medical Ctr. (USA)

Program Committee: **Amir A. Amini**, Univ. of Louisville (USA); **Thorsten M. Buzug**, Univ. zu Lübeck (Germany); **Juan R. Cebal**, George Mason Univ. (USA); **Yu Chen**, Univ. of Maryland, College Park (USA); **Anne Clough**, Marquette Univ. (USA); **Andreas H. Hielscher**, Columbia Univ. (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 (USA); **Merryn H. Tawhai**, The Univ. of Auckland (New Zealand); **Nicholas J. Tustison**, Univ. of Virginia (USA); **Axel Wismueller**, Univ. of Rochester Medical Ctr. (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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
- 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
- Magnetic particle imaging (MPI)
- 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



- Present a paper and participate in the conference
- Receive feedback from your peers
- Hear the latest research
- Network with your colleagues
- Publish your work.

Submit your abstract today!

spie.org/micall

Image Perception, Observer Performance, and Technology Assessment (MI106)

Conference Chairs: **Craig K. Abbey**, Univ. of California, Santa Barbara (USA); **Claudia R. Mello-Thoms**, Univ. of Pittsburgh Cancer Institute (USA)

Program Committee: **Kevin S. Berbaum**, The Univ. of Iowa Hospitals and Clinics (USA); **Darrin C. Edwards**, The Univ. of Chicago Medical Ctr. (USA); **Matthew A. Kupinski**, College of Optical Sciences, The Univ. of Arizona (USA); **Anthony J. Maeder**, Univ. of Western Sydney (Australia); **David J. Manning**, Lancaster Univ. (United Kingdom); **Mark F. McEntee**; **Berkman Sahiner**, U.S. Food and Drug Administration (USA); **David L. Wilson**, Case Western Reserve Univ. (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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 acquisition, display and workstations, psychophysical 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. The conference welcomes new areas of research as well.

Original papers and posters are requested in the following areas:

- Technology assessment
- Diagnostic-performance evaluation methodologies (ROC, FROC and alternatives)
- Observer performance evaluation of new technologies (Acquisition devices, CAD, display devices etc.)
- Cognitive aspects of image interpretation
- Perceptual and performance factors in diagnostic workstation and environmental design
- Perceptual and performance factors in new modalities (e.g., digital pathology and telemedicine)
- Models of detection, discrimination, and localization
- The nature of reader expertise
- Sources of observer variance.

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.

- Image Display
- Image Perception
- Observer Performance Evaluation
- ROC Methodology
- Model Observers
- Technology Assessment
- Technology Impact
- Other (please specify)

Advanced PACS-based Imaging Informatics and Therapeutic Applications (MI107)

Conference Chairs: **William Boonn**, The Univ. of Pennsylvania Health System (USA); **Brent J. Liu**, The Univ. of Southern California (USA)

Program Committee: **James Chen**, Univ. of California, San Diego (USA); **Janice C. Honeyman-Buck**, Univ. of Florida (USA); **Steven C. Horii**, The Univ. of Pennsylvania Health System (USA); **Woojin Kim**, The Univ. of Pennsylvania Health System (USA); **Maria Y. Law**, The Hong Kong Polytechnic Univ. (Hong Kong, China); **Heinz U. Lemke**, Computer Assisted Radiology and Surgery (Germany); **Khan M. Siddiqui**, Microsoft Corp. (USA); **Eliot L. Siegel**, Univ. of Maryland Medical Ctr. (USA); **John B. Strauss**, Microsoft Corp. (USA); **Wyatt Tellis**, Univ. of California, San Francisco (USA); **Jianguo Zhang**, Shanghai Institute of Technical Physics (China); **Stefan L. Zimmerman**, The Johns Hopkins Univ. (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

Rapid developments in imaging and information technology have led to significant changes in the design and implementation of Picture Archiving and Communication Systems (PACS) and related imaging and healthcare information management systems. A new focus on Cloud and Mobile computing along with a continued emphasis on systems integration, workflow and globalization of information management has led 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:

Cloud Computing

A new session focused on the application of cloud computing technology to Imaging Informatics and Healthcare. Suggested topics include image sharing applications, distributed image processing, and design, implementation, and challenges in cloud storage architecture.

Mobile Computing

An additional new session focused on the use of mobile devices in Radiology and other imaging related specialties. This session will cover topics including mobile application development, security and networking challenges, mobile display performance, and imaging workflow performance utilizing mobile devices.

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.

Therapeutic Applications and Extending Imaging Informatics beyond Radiology

Other image-intensive therapeutic applications (eg, Surgery, 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 rehabilitative sciences are also included. Topics relating to research work performed based on DICOM WG26 are encouraged as well.

Imaging Informatics in Translational Research

This 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.

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.

- Cloud Computing
- Mobile Computing
- Systems Integration and Standards
- Database, Knowledge, Search, and Data Mining Development
- Advanced PACS-based Radiology Workflow
- Therapeutic Applications and Extending Imaging Informatics beyond Radiology
- Imaging Informatics in Translational Research

SPIE Medical Imaging 2012

Ultrasonic Imaging, Tomography, and Therapy (MI108)

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

Program Committee: **Jeffrey C. Bamber**, The Royal Marsden NHS Foundation Trust (United Kingdom); **Jan D'hooge**, Katholieke Univ. Leuven (Belgium); **Nebojsa Duric**, Delphinus Medical Technologies (USA); **Stanislav Y. Emelianov**, The Univ. of Texas at Austin (USA); **James F. Greenleaf**, Mayo Clinic (USA); **Michael F. Insana**, Univ. of Illinois at Urbana-Champaign (USA); **Jørgen A. Jensen**, Technical Univ. of Denmark (Denmark); **Stephen A. McAleavey**, Univ. of Rochester (USA); **Kirk K. Shung**, The Univ. of Southern California (USA); **Kai E. Thomenius**, General Electric Co. (USA); **William F. Walker**, Univ. of Virginia (USA)

All submissions must include:

A 250-word abstract, and a two- to four-page supplemental file (see Submission Guidelines)

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 2012 conference will put special emphasis on all aspects related to ultrasound guidance and image analysis (for intervention monitoring, estimation of function, etc.).

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.

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 therapy
- Ultrasound image analysis
- Motion and deformation estimation
- Contrast imaging
- Tissue characterization
- Optoacoustic imaging
- High frequency imaging
- New applications of ultrasound in medicine and biology
- Other, please specify.



Submit your abstract today!

spie.org/micall

2012 Medical Imaging



Conference Sponsorship Opportunities

This year's SPIE Medical Imaging conference sponsorships provide you with a unique opportunity to interact with the leading professionals in the field and to participate in the event with high-profile visibility and recognition.

This is an easy, cost-effective way to be seen by your target audience before and during the conference.

Sponsor Packages:

'Gold' Sponsor Level – \$5000 (2 Available)

'Silver' Sponsor Level – \$2000 (5 Available)

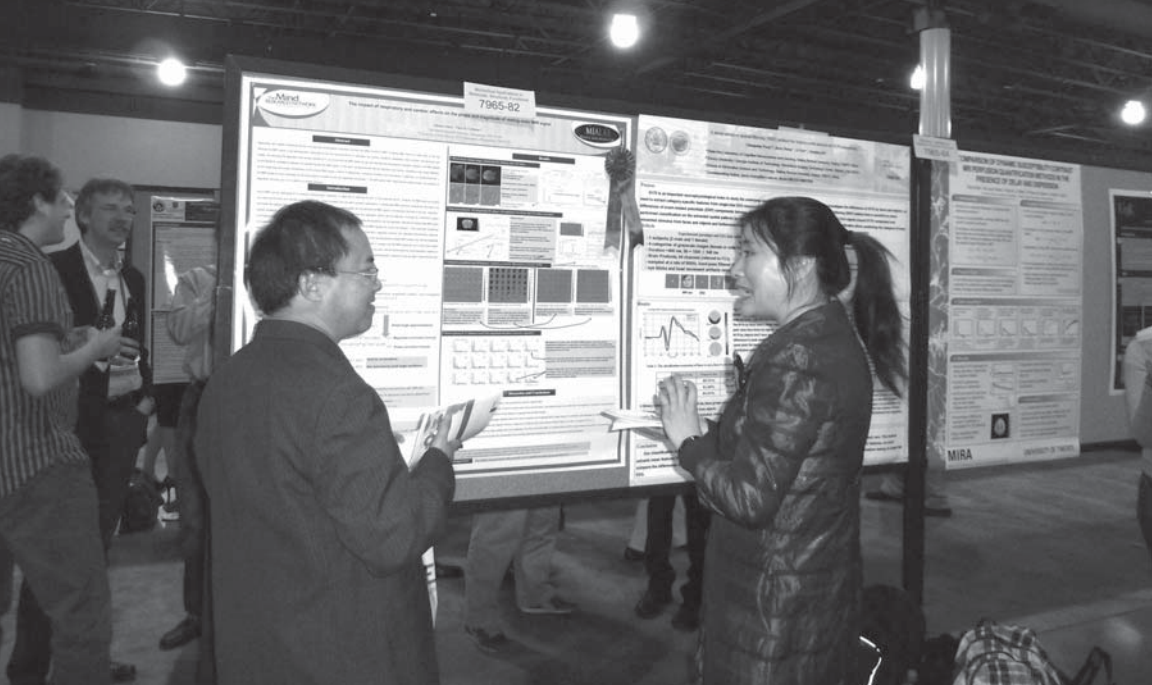
Event Specific Sponsorships:

Best Student Paper	\$1,250 (Exclusive)
Poster Sessions	\$1,250 (Exclusive each day)
Workshops	\$1,250 (2 Available)
Conference Sponsor	\$1,250 (Exclusive, one sponsor per conference)

Advertising Opportunities:

Print and Web Ads **\$970 – \$2,000**

Get details online: spie.org/mi-sponsor
or email Al Ragan, alr@spie.org



Participate in a Poster Session

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

Each conference review committee recognizes a selected poster at the cum laude level for best poster presentation in their conference. Congratulations to the following who received this award in 2011.

Congratulations to the 2011 Poster Award Winners

The use of detectability indices as a means of automatic exposure control for a digital mammography system

Paper 7961-201

Authors: **Elena Salvagnini**, UZ Gasthuisberg (Belgium) and SCK•CEN (Belgium); **Nicholas W. Marshall**, UZ Gasthuisberg (Belgium); **Pascal Monnin**, Institut Univ. de Radiophysique Appliquée (Switzerland); **Lara Struelens**, SCK•CEN (Belgium); **Francis R. Verdun**, Institut Univ. de Radiophysique Appliquée (Switzerland); **Hilde Bosmans**, UZ Gasthuisberg (Belgium)

An iterative particle filter approach for respiratory motion estimation in nuclear medicine imaging

Paper 7962-155

Authors: **Ashrani A. Abd Rahni**, **Kevin Wells**, **Emma Lewis**, Univ. of Surrey (UK); **Matthew Guy**, Southampton General Hospital (UK) and Univ. of Surrey (UK); **Budhaditya Goswami**, Univ. of Surrey (UK)

Automatic colonic polyp shape determination using content-based image retrieval

Paper 7963-87

Authors: **Javed M. Aman**, **Ronald M. Summers**, **Jianhua Yao**, National Institutes of Health (USA)

Correspondenceless 3D-2D registration based on expectation conditional maximization

Paper 7964-108

Authors: **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)

Automatic 3D segmentation of ultrasound images using atlas registration and statistical texture prior

Paper 7964-111

Authors: **Xiaofeng Yang**, **David Schuster**, **Viraj Master**, **Peter Nieh**, Emory Univ. (USA); **Aaron Fenster**, Robarts Research Institute (Canada); **Baowei Fei**, Emory Univ. (USA)

The impact of respiratory and cardiac effects on the phase and magnitude of resting-state fMRI data

Paper 7965-82

Authors: **Zikuan Chen**, **Qing He**, **Vince D. Calhoun**, The Mind Research Network (USA)

Assessment of updated CAD without a new reader study: effect of calibration of computer output on the computer-aided reader performance in CADx

Paper 7966-61

Authors: **Weijie Chen**, **Nicholas A. Petrick**, **Berkman Sahiner**, U.S. Food and Drug Administration (USA)

DICOM structured report to track patient's radiation dose to organs from abdominal CT exams

Paper 7967-32

Author: **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)

Improved detectability of hypoechoic regions with short-lag spatial coherence imaging: experimental validation

Paper 7968-48

Authors: **Marko Jakovljevic**, **Jeremy J. Dahl**, **Gregg E. Trahey**, Duke Univ. (USA)

Congratulations to the 2011 Student Paper Award Recipients



The 1st place award was presented to:

Raymond J. Acciavatti, The Univ. of Pennsylvania Health System (USA)

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

Co-authored with Andrew D. Maidment, The Univ. of Pennsylvania Health System (USA)

The 2nd place award was presented to:

Sebastian Röhl, Karlsruher Institut für Technologie (Germany)

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

Co-authored with 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)

2012 Student Paper Awards Information

ATTENTION STUDENTS

Below are the submission instructions and eligibility requirements for the 2012 Student Paper Awards.

Submissions Due: 5 December 2011

The winners of this award will be students:

- without a doctoral degree
- who are the principal authors of the paper in the current program
- selected by the review committee.

A first place winner and runner-up will be recognized with a cash prize and a certificate during the plenary session at the meeting.

To be considered, students must submit electronic copies of:

- the full manuscript to the Conference Programs Coordinator (SandyH@spie.org) - no later than 5 December 2011.
- a signed letter from the student's advisor stating that the principal contribution to the work described was made by the student.

NOTE: This manuscript will be used for review purposes only. A separate manuscript must be submitted for publication by the manuscript due date.

General Information



Venue

Town and Country Resort & Convention Center

500 Hotel Circle North
San Diego, CA 92108, USA

The Town and Country Resort & Convention Center features 1,000 guest rooms spread over 40 lushly landscaped acres in San Diego's Mission Valley.

Three swimming pools, full service spa and health club, barber and beauty services, in-room movies, valet and room services, and a complimentary morning newspaper are available to each guest! Located in the heart of Mission Valley, the Town and Country Resort is ideally situated for attendees and their guests to enjoy the many adjacent and nearby attractions.

About San Diego

Welcome to San Diego, California's second largest city. Where blue skies keep watch on 70 miles of beaches and a gentle Mediterranean climate begs for a day of everything and nothing. Bordered by Mexico, the Pacific Ocean, the Anza-Borrego Desert and the Laguna Mountains, San Diego County's 4,200 square miles offer immense options for business and pleasure.

Visit the San Diego Visitor Site [<http://www.sdcvb.org/nav/Visitors>] for more information about the local area.

Technical Program

Available October 2011

The comprehensive Advance Technical Program for this symposium will list conferences, paper titles, and authors in order of presentation; an outline of all planned special events; and hotel and registration information.

Registration

SPIE Medical Imaging registration will be available October 2011.

All participants, including invited speakers, contributed speakers, session chairs, co-chairs, and committee members, must pay a registration fee.

Fee information for conferences, courses, a registration form, and technical and general information will be available on the SPIE website in October.

Hotel Information

The hotel reservation process for Medical Imaging 2011 is tentatively scheduled to open mid-October 2011. SPIE will arrange discounted hotel rates for SPIE attendees that will be available when housing opens.

Complete travel information will be available in early November 2011.

Airport Information

Enjoy the convenience of flying into and out of San Diego International Airport.

San Diego International Airport (SAN) is conveniently located three miles northwest of downtown San Diego. Numerous airlines fly into and out of SAN.

Visa Information

Because of the number of visa applications and the need for thorough security reviews, the visa application process can take several months. It is strongly encouraged for travelers to apply for their visas as early as possible (at least 3 to 4 months before the visa is needed).

View more information about visas or passport requirements: <http://spie.org/x37840.xml>

Student Travel Contingency Grants

A limited number of SPIE contingency student travel grants will be awarded based on need. Applications are available online and must be received no later than 10 weeks prior to the meeting. Eligible applicants must present an accepted paper at this meeting. Offer applies to undergraduate/graduate students who are enrolled full-time and have not yet received their PhD.

SPIE is the international society for optics and photonics founded in 1955 to advance light-based technologies. Serving more than 188,000 constituents from 138 countries, the Society advances emerging technologies through interdisciplinary information exchange, continuing education, publications, patent precedent, and career and professional growth.

SPIE International Headquarters
P.O. Box 10, Bellingham, WA 98227-0010 USA
Tel: +1 888 504 8171 or +1 360 676 3290
Fax: +1 360 647 1445
customerservice@spie.org • spie.org



Critical Dates

Abstract Due Date: 25 July 2011

Post-Meeting Manuscript Due Date:
9 January 2012

By submitting an abstract, I agree to the following conditions:

An author or coauthor (including keynote, invited, oral, and poster presenters) will:

- Register at the reduced author registration rate (current SPIE Members receive an additional discount on the registration fee).
- Attend the meeting.
- Make the presentation as scheduled in the program.
- Submit a full-length manuscript (6 pages minimum) for publication in the SPIE Digital Library, Proceedings of SPIE, and CD-ROM compilations.
- Obtain funding for their registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
- Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.

Submit an abstract and summary online at: spie.org/micall

- Please submit a 250-word text abstract for technical review purposes that is suitable for publication. SPIE is authorized to circulate your abstract to conference committee members for review and selection purposes.
- Please also submit a 100-word text summary suitable for early release. If accepted, this summary text will be published prior to the meeting in the online or printed programs promoting the conference.
- Identify the topics appropriate to the specific conference. During the submission process you will be asked to choose no more than three topics from a predefined list and/or add a topic not included on the list. (See individual conference Call for Papers for topic categories.)
- Prepare your 2-4 page supplemental MS Word or PostScript file. Supplemental file instructions can be found online. For full consideration this file must include the paper title, authors, 250-word abstract text, and the following supplemental information:
 - Description of purpose
 - Method(s)
 - Results
 - New or breakthrough work to be presented
 - Conclusions
 - Whether the work is being, or has been, submitted for publication or presentation elsewhere, and, if so, indicate how the submissions differ.
 - This file may contain supporting images/tables/figures
 - Failure to follow these guidelines may disqualify your submission.
- Only original material should be submitted.
- Abstracts should contain enough detail to clearly convey the approach and the results of the research.

- Commercial papers, papers with no new research/development content, and papers where supporting data or a technical description cannot be given for proprietary reasons will not be accepted for presentation in this conference.
- Please do not submit the same, or similar, abstracts to multiple conferences.

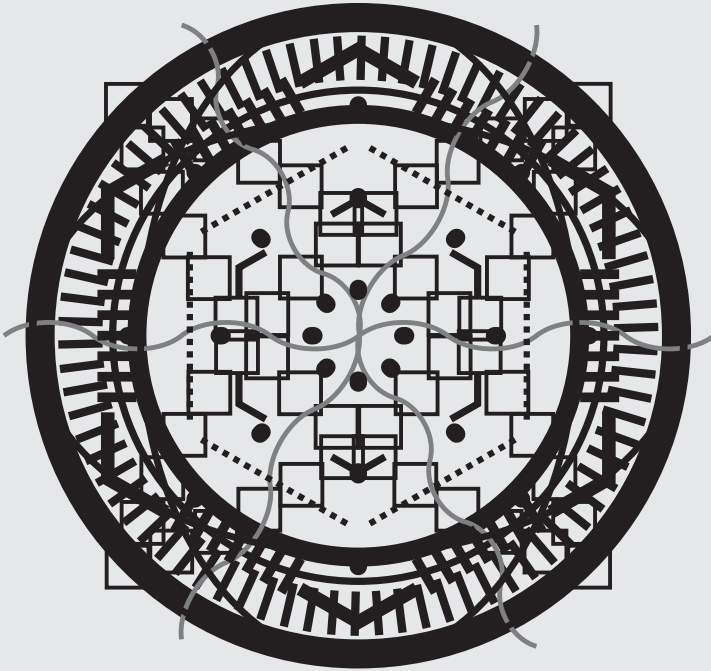
Review, Notification, and Program Placement Information

- To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
- Conference Chair/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
- The contact author will receive notification of acceptance and presentation details by e-mail no later than 3 October 2011.
- Final placement in an oral or poster session is subject to the Chairs' discretion.

Proceedings of SPIE and SPIE Digital Library Information

- Conference Chair/Editors may require manuscript revision before approving publication and reserve the right to reject for publication any paper that does not meet acceptable standards for a scientific publication. Conference Chair/Editors' decisions on whether to allow publication of a manuscript is final.
- Manuscript instructions are available from the "Author/Presenter Information" link on the conference website.
- Authors must be authorized to transfer copyright of the manuscript to SPIE, or provide a suitable publication license.
- Only papers presented at the conference and received according to publication guidelines and timelines will be published in the conference Proceedings of SPIE and SPIE Digital Library.
- SPIE partners with relevant scientific databases to enable researchers to find the papers in the Proceedings of SPIE easily. The databases that abstract and index these papers include Astrophysical Data System (ADS), Chemical Abstracts (relevant content), Compendex, CrossRef, Current Contents, DeepDyve, Google Scholar, Inspec, Portico, Scopus, SPIN, and Web of Science Conference Proceedings Citation Index.





Helping engineers and
scientists stay current
and competitive



Astronomy



Biomedical
Optics



Communications



Defense
& Security



Energy



Imaging



Nanophotonics



Sensors



Enjoy the flexibility and freedom of staying at the **Town & Country**

BENEFITS:

- Affordable Rates
- Free Internet
- Free Parking at the Hotel
- Free Continental Breakfast
- Full Service Resort
- Within walking distance of shopping, entertainment, and restaurants
- Save on rental car costs

Plus, the convenient proximity to the conference allows you to go to your room to work, mingle with other conference attendee hotel guests during non-conference times, and save on travel times.

Read the Call for Papers and take the first step towards submitting an abstract today!

SPIE
Medical Imaging



spie.org/micall



2012
Call for Papers
Submit your abstract
by 25 July 2011

SPIE 
Medical Imaging
Submit your abstract today

Join the most innovative minds in
Physics, image processing, CAD, visualization and
modeling, PACS, perception, ultrasonic imaging,
biomedical research, and more.

spie.org/micall

4–9 February 2012
Town and Country Resort and Convention Center
San Diego, California, USA

SPIE

P.O. Box 10
Bellingham, WA 98227-0010 USA

Non-Profit Org.
U.S. Postage
Paid
SPIE