

The **Scoliosis Research Society** (www.srs.org) is a professional society devoted to scoliosis research.

Two journals relevant to my Master's work are:

- *Scoliosis and Spinal Disorders* (<http://scoliosisjournal.biomedcentral.com/>)
- *Ultrasound in medicine and biology* (<http://www.umbjournal.org/>)

Two relevant conferences are:

- The Imaging Network of Ontario's (ImNO) annual symposium (www.imno.ca)
- The International Society for Optics and Photonics' (SPIE) Medical Imaging conference (<http://spie.org/conferences-and-exhibitions/medical-imaging/conferences>)

A thesis related to my work is:

Feasibility Study of Ultrasound Measurements on the Human Lumbar Spine

(https://etd.auburn.edu/bitstream/handle/10415/1302/pothuganti_virabadra_46.pdf?sequence=1)

Three web presences related to my work are:

- BK Ultrasound's blog (<http://blog.bkultrasound.com/>), particularly their musculoskeletal posts
- The National Scoliosis Foundation's news page (<http://www.scoliosis.org/news/>)
- The Visualization Toolkit's (VTK) user mailing list (<http://www.vtk.org/mailman/listinfo/vtkusers>)

2017

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22 JULY 2016



PLAN 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. The event focuses on the latest innovations found in underlying fundamental scientific principles, to technology developments, scientific evaluation, and clinical application. The symposium covers the full range of medical imaging modalities including medical image acquisition, display, processing, analysis, perception, decision support, and informatics. Broad topics of interest include the following:

- imaging physics, systems analysis and modeling
- X-ray imaging and computed tomography
- ultrasonic acquisition, processing and tomography
- magnetic resonance imaging (MRI)
- molecular imaging
- digital pathology
- emerging image acquisition technologies
- tomographic image reconstruction
- quantitative imaging and radiomics
- image processing and analysis
- computer-aided detection and diagnosis
- deep learning in medical imaging
- computational models
- image-guided therapies
- visual rendering of complex datasets
- visual perception and observer performance
- physiological and functional interpretation of image data
- clinical and technical evaluation of new technologies
- image data management (sharing, storage, retrieval, transmission, big data)
- medical informatics
- computational anatomy
- imaging for precision medicine.

Join your peers where collaboration brings ideas to life and technology to market. Hear the work, network with leaders in the field, and see the applications of the future. We look forward to seeing you in Orlando!

SYMPOSIUM CHAIRS:



Berkman Sahiner,
U.S. Food and Drug
Administration(USA)



Leonard Berliner
Weill Cornell Medical
College (USA) and
New York Methodist
Hospital (USA)

2017 STUDENT PAPER AWARDS INFORMATION

ATTENTION STUDENTS

See web for submission instructions and eligibility requirements for the 2017 awards.

Submission instructions and eligibility requirements for the 2017 All Conference Best Student Paper Awards will be available in October 2017.

See 2016 Award Winners online: www.spie.org/awards2016

COOPERATING ORGANIZATIONS:

AAPM—American Association of Physicists in Medicine

APS—American Physiological Society

CARS—International Foundation for
Computer Assisted Radiology and Surgery

MIPS—Medical Image Perception Society

RSNA—Radiological Society of North America

SIIM—Society for Imaging Informatics in Medicine

WMIS—World Molecular Imaging Society
The DICOM Standards Committee

Physics of Medical Imaging (MI101)

Conference Chairs: **Thomas G. Flohr**, Siemens Healthcare GmbH (Germany); **Joseph Y. Lo**, Duke Univ. Medical Ctr. (USA)

Conference Co-Chair: **Taly Gilat Schmidt**, Marquette Univ. (USA)

Program Committee: **Andreu Badal**, U.S. Food and Drug Administration (USA); **Kirsten Boedeker**, Toshiba Medical Research Institute USA (USA); **Hilde Bosmans**, Katholieke Univ. Leuven (Belgium); **Guang-Hong Chen**, Univ. of Wisconsin-Madison (USA); **Mini Das**, Univ. of Houston (USA); **Mats E. Danielsson**, KTH Royal Institute of Technology (Sweden); **Maria Drangova**, Robarts Research Institute (Canada); **Rebecca Fahrig**, Siemens Healthcare GmbH (Germany), Stanford Univ. School of Medicine (USA); **Stephen J. Glick**, U.S. Food and Drug Administration (USA), Univ. of Massachusetts Medical School (USA); **Michael Grass**, Philips Research (Germany); **Christoph Hoeschen**, Helmholtz Zentrum München GmbH (Germany); **Marc Kachelrieß**, Deutsches Krebsforschungszentrum (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); **Jinyi Qi**, Univ. of California, Davis (USA); **Magdalena Rafecas**, Univ. zu Lübeck (Germany); **John A. Rowlands**, Thunder Bay Regional Research Institute (Canada); **John M. Sabol**, GE Healthcare (USA); **Joseph W. Stayman**, Johns Hopkins Univ. (USA); **Anders Tingberg**, Lund Univ. (Sweden); **John Yorkston**, Carestream Health, Inc. (USA); **Wei Zhao**, Stony Brook Medicine (USA)

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). 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. Papers of a theoretical nature or papers reporting new experimental results are invited. Topics of particular interest include experimental methods and results regarding image performance, image reconstruction, detector materials and electronic design, analytical and computer modeling of imaging systems, and novel methods for image formation including the physics of contrast media. The conference will cover predicted and measured system performance, including image noise and contrast, spatial and temporal resolution, and inherent artifacts. Work directed toward the imaging of human subjects, small animals, or tissue specimens are welcome. The conference will also cover dedicated approaches for various imaging tasks resulting from the above mentioned general imaging framework, like cardiovascular or neuroimaging tasks.

Original papers are especially requested in the following areas:

IMAGING SCIENCE

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

TECHNOLOGY

- Novel medical imaging systems and methods including contrast media / nanoparticles
- Properties of scintillating, photoconductive, or other sensor materials
- Novel sources of radiation
- Image reconstruction methods (e.g., for CT, tomosynthesis, SPECT and PET, 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)
- Photon counting
- Proton based imaging
- Radiation (e.g., optical) and signal transport
- Radiation dose, dosimetry, and dose effects (risk), as well as possible stratification

DEVICES

- Advanced multi-slice or cone beam CT systems
- Advanced radiographic, fluoroscopic, or angiographic systems (including phase contrast and diffraction)
- Non-ionizing radiation systems (ultrasound, MRI, optical, thermal, magnetic particle imaging)
- Small animal imaging systems
- Nuclear medical imaging methods
- Multi-modality imaging devices
- Low-cost imaging devices with global health applications

APPLICATIONS

- Cardiovascular imaging
- Neuroimaging
- Mammographic imaging
- Interventional imaging
- Imaging applications in therapy (e.g., radiation therapy, surgery, in-vivo verification)
- Functional imaging (perfusion, spectral imaging)
- Advanced applications (clinical, translational, preclinical, basic science, biomarkers)
- Novel medical imaging for precision medicine applications

TOPIC AREAS: FOR THIS CONFERENCE ONLY

During the submission process, you will be asked to choose three different categories to assist in the review process.

Choose one from each category: methodology (e.g., image quality metrics, detector development, etc.), system (phase contrast, CT, CBCT, ultrasound MRI etc.), and application (cardiovascular, biomarkers, neuroimaging, etc.).

CATEGORY 1 (METHODOLOGY):

- ALG - Algorithmic developments, simulations, calibration, classification, etc. (for reconstruction use dedicated categories)
- CLIN - Clinical evaluation
- CON - Physics of contrast enhancement using contrast media / nanoparticles
- DET - Detector technology; scintillators, photoconductors, diodes, TFT
- DOSE - Radiation dose, dosimetry, and dose effects
- METR - Measurement methods (MTF, NPS, DQE, eDQE, gDQE, Spectra, ...)
- PER - Observer or perception-based performance evaluations of systems
- PHT - Work involving development of phantoms or anatomical simulation models
- RECON - Image reconstruction including CT, SPECT, PET, OCT and tomosynthesis
- XIM - X-ray imaging, x-ray sources, scatter reduction techniques
- XME - Multi-energy radiography or mammography
- OTHER - Other methodology

CATEGORY 2 (SYSTEMS):

- CT - All conventional and multi-energy CT topics (for cone beam use dedicated category)
- CTCB - Cone beam CT
- IMG - Imaging methods including optical, MR, ultrasound, etc. (for x-ray or nuclear based methods use dedicated categories)
- NUC - Nuclear medical imaging innovations (for reconstruction use dedicated category)
- PCI - Photon counting imaging
- PHS - Phase contrast imaging
- PRI - Proton based imaging
- TSY - Tomosynthesis
- OSY - Other complete systems

CATEGORY 3 (APPLICATIONS):

- CARD - Cardiovascular imaging
- DIAG - Diagnostic imaging
- IGI - Image guided interventions
- MAM - Imaging of the breast (any device)
- NEURO - Neuroimaging
- ONC - Oncology
- SMAX - Small animal or microscopic imaging
- VER - In-vivo verification
- OAPPS - Other applications (including translational preclinical imaging)

Returning in 2017

FOCUS ON PRECISION MEDICINE

PRECISION MEDICINE is an emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person. If your research is related and you want to participate in this special focus, enter "PRECISION MEDICINE" when prompted during your abstract submission. Accepted papers will be highlighted in the technical program. Information regarding the Precision Medicine Initiative is available at

<https://www.whitehouse.gov/precision-medicine>

Learn about the Precision Medicine Initiative Cohort Program and funding

<https://www.nih.gov/precision-medicine-initiative-cohort-program>

Image Processing (MI102)

Conference Chairs: **Martin A. Styner**, The Univ. of North Carolina at Chapel Hill (USA); **Elsa D. Angelini**, Columbia Univ. (USA), Télécom ParisTech (France)

Program Committee: **Rafeef Abugharbieh**, The Univ. of British Columbia (Canada); **Paul Aljabar**, King's College London (United Kingdom);

Mostafa Analoui, Livingston Securities LLC (USA); **Brian B. Avants**, Univ. of Pennsylvania (USA); **Meritxell Bach-Cuadra**, Univ. de Lausanne (Switzerland); **Kyongtae Ty Bae**, Univ. of Pittsburgh Medical Ctr. (USA); **Christian Barillot**, IRISA / INRIA Rennes (France); **Benoit M. Dawant**, Vanderbilt Univ. (USA); **Marleen de Bruijne**, Erasmus MC (Netherlands); **Alexandre X. Falcão**, Univ. Estadual de Campinas (Brazil); **Aaron Fenster**, Robarts Research Institute (Canada); **Alejandro F. Frangi**, The Univ. of Sheffield (United Kingdom); **Mona K. Garvin**, The Univ. of Iowa (USA); **James C. Gee**, Univ. of Pennsylvania (USA); **Guido Gerig**, The Univ. of Utah (USA); **Benjamin Glocker**, Imperial College London (United Kingdom); **Miguel Angel González Ballester**, Univ. Pompeu Fabra (Spain); **Hayit Greenspan**, Tel Aviv Univ. (Israel); **Ghassan Hamarneh**, Simon Fraser Univ. (Canada); **David R. Haynor**, Univ. of Washington (USA); **Tobias Heimann**, Siemens AG (Germany); **Ivana Išgum**, Univ. Medical Ctr. Utrecht (Netherlands); **Stefan Klein**, Erasmus MC (Netherlands); **Bennett A. Landman**, Vanderbilt Univ. (USA); **Tianhu Lei**, MD Imaging Research (USA); **Boudewijn P. F. Lelieveldt**, Leiden Univ. Medical Ctr. (Netherlands); **Marius George Linguraru**, Children's National Medical Ctr. (USA); **Murray H. Loew**, The George Washington Univ. (USA); **Cristian Lorenz**, Philips Research (Germany); **Frederik Maes**, Katholieke Univ. Leuven (Belgium); **Diana Mateus**, Technische Univ. München (Germany); **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); **Johns Hopkins Univ. (USA); Mads Nielsen**, Niels Bohr Institute (Denmark); **Wiro J. Niessen**, Erasmus MC (Netherlands); **Brian Nutter**, Texas Tech Univ. (USA); **Sébastien Ourselin**, Univ. College London (United Kingdom); **Dzung L. Pham**, Henry Jackson Foundation/USU (USA), National Institutes of Health (USA) and Johns Hopkins Univ. (USA); **Jerry L. Prince**, Johns Hopkins Univ. (USA); **Sonia Pujol**, Brigham and Women's Hospital (USA); **Punam K. Saha**, The Univ. of Iowa (USA); **Olivier Salvado**, Commonwealth Scientific and Industrial Research Organisation (Australia); **Lin Shi**, The Chinese Univ. of Hong Kong (China); **Marius Staring**, Leiden Univ. Medical Ctr. (Netherlands); **Philippe Thevenaz**, Ecole Polytechnique Fédérale de Lausanne (Switzerland); **Jayaram K. Udupa**, Univ. of Pennsylvania (USA); **Koen Van Leemput**, Harvard Medical School (USA), Massachusetts General Hospital (USA); **Tom K. Vercauteren**, Univ. College London (United Kingdom); **Tomaž Vrtovec**, Univ. of Ljubljana (Slovenia); **Wolfgang Wein**, ImFusion GmbH (Germany)

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, neuroimaging, 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.

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

- Augmented/virtual reality
- Classification
- Compressed sensing, sparse reconstruction methods
- Computational anatomy and atlases
- Computer vision
- Deformable geometry
- Diffusion MRI analysis
- Functional imaging and connectivity analysis
- Image representation and compression
- Image restoration and enhancement
- Image synthesis
- Imaging genetics and precision medicine
- Machine learning and pattern recognition
- Model-based image analysis
- Motion/time series analysis
- Open software for medical image processing and translational research
- Population/clinical studies
- Quantitative image analysis/quantitative imaging biomarkers
- Registration methodologies
- Segmentation methodologies
- Shape representation and analysis
- Statistical methodology
- Texture representation and analysis
- Validation, including creation of 'ground truth' image repositories
- Visualization methods
- Voxel/deformation/tensor-based morphometry

TOPIC AREAS: FOR THIS CONFERENCE ONLY

To assist the reviewers, choose up to three keywords in order of relevance from the following list.

- Augmented/virtual reality
- Classification
- Compressed sensing, sparse reconstruction methods
- Computational anatomy and atlases
- Computer vision
- Deformable geometry
- Diffusion MRI analysis
- Functional imaging and connectivity analysis
- Image representation and compression
- Image restoration and enhancement
- Image synthesis
- Imaging genetics and precision medicine
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- Segmentation methodologies
- Shape representation and analysis
- Statistical methodology
- Texture representation and analysis
- Validation, including creation of 'ground truth' image repositories
- Visualization methods
- Voxel/deformation/tensor-based morphometry

Computer-Aided Diagnosis (MI103)

Conference Chairs: **Samuel G. Armato III**, The Univ. of Chicago (USA); **Nicholas A. Petrick**, U.S. Food and Drug Administration (USA)

Program Committee: **Susan M. Astley**, The Univ. of Manchester (United Kingdom); **Stephen Aylward**, Kitware, Inc. (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); **Karen Drukker**, The Univ. of Chicago (USA); **Catalin Fetita**, Télécom SudParis (France); **Hiroshi Fujita**, Gifu Univ. School of Medicine (Japan); **Maryellen L. Giger**, The Univ. of Chicago (USA); **Hayit Greenspan**, Tel Aviv Univ. (Israel); **Lubomir M. Hadjiiski**, Univ. of Michigan Health System (USA); **Horst Karl Hahn**, Fraunhofer MEVIS (Germany); **Khan M. Iftekharuddin**, Old Dominion Univ. (USA); **Nico Karssemeijer**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **JongHyo Kim**, Seoul National Univ. Hospital (Korea, Republic of); **Marius George Linguraru**, Children's National Medical Ctr. (USA); **Fabrice Meriaudeau**, Univ. de Bourgogne (France); **Kensaku Mori**, Nagoya Univ. (Japan); **Janne J. Näppi**, Massachusetts General Hospital (USA); **Noboru Niki**, Univ. of Tokushima (Japan); **Carol L. Novak**, Siemens Corp., Corporate Technology (USA); **Clarisa I. Sánchez**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Ronald M. Summers**, National Institutes of Health (USA); **Kenji Suzuki**, Illinois Institute of Technology (USA); **Georgia D. Tourassi**, Oak Ridge National Lab. (USA); **Bram van Ginneken**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Eva M. van Rikxoort**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Rafael Wiemker**, Philips Research (Germany); **Axel Wismüller**, Univ. of Rochester Medical Ctr. (USA); **Xiaofeng Yang**, Emory Univ. (USA); **Hiroyuki Yoshida**, Massachusetts General Hospital (USA)

This conference will provide a forum for researchers involved in development and application of computer-aided detection and diagnosis systems. Original papers are requested on all aspects of CAD, including segmentation, pattern recognition, feature extraction, classifier design, workstation design, human interaction, radiomics, database construction, and system performance evaluation. CAD methods involving any medical imaging modality are encouraged, including but not limited to x-ray, CT, MRI, nuclear medicine, molecular imaging, optical, ultrasound, endoscopy, macroscopic and microscopic imaging, and multi-modality technologies.

LIVE DEMONSTRATIONS WORKSHOP

A workshop featuring real-time demonstrations of algorithms and systems will be held during the conference. This workshop is intended to be a forum for developers to exhibit their software, find new collaborators, and inspire the attendees. All participants of the SPIE Medical Imaging Symposium are invited to submit a proposal for a demonstration. More information will be provided at a later date.

GRAND CHALLENGE

A CAD grand challenge will be organized as part of the conference in conjunction with the American Association of Physicists in Medicine (AAPM) and the U.S. National Cancer Institute (NCI). This event evolved from the well-received CAD Grand Challenges panel discussion held during the CAD Conference of the 2016 SPIE Medical Imaging Symposium and will extend the successful LUNGx Challenge conducted during the CAD Conference in 2015. More information on the CAD application and modality for the challenge 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 Topics) from the following list to assist in the review process.

Choose one topic from the following applications 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: Musculoskeletal
- Applications: Pediatrics/Fetal
- Applications: Precision Medicine
- Applications: Prostate
- Applications: Other Organ Systems
- Applications: Multiple Organ Systems
- Applications: Novel Applications

Choose up to two keywords from the following topics list:

- Radiomics
- Machine learning, including deep learning
- Classification and feature analysis
- Decision support systems
- Characterization and staging
- Risk assessment
- Detection
- Content-based image retrieval and/or reference libraries
- Comparative evaluation and/or fusing CAD systems
- CAD system quality and validation
- Segmentation
- Visualization and human factors in CAD
- CAD training/testing databases
- Other (please specify)

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

Conference Chairs: **Robert J. Webster III**, Vanderbilt Univ. (USA); **Baowei Fei**, Emory Univ. (USA)

Program Committee: **Purang Abolmaesumi**, The Univ. of British Columbia (Canada); **Wolfgang Birkfellner**, Medizinische Univ. Wien (Austria); **Sandrine de Ribaupierre**, Western Univ. (Canada); **Gabor Fichtinger**, Queen's Univ. (Canada); **George J. Grevera**, Saint Joseph's Univ. (USA); **David Hawkes**, Univ. College London (United Kingdom); **David R. Haynor**, Univ. of Washington (USA); **William E. Higgins**, The Pennsylvania State Univ. (USA); **David R. Holmes III**, Mayo Clinic (USA); **Pierre Jannin**, Univ. de Rennes 1 (France); **David M. Kwartowitz**, Clemson Univ. (USA); **Cristian A. Linte**, Rochester Institute of Technology (USA); **Lena Maier-Hein**, Deutsches Krebsforschungszentrum (Germany); **Michael I. Miga**, Vanderbilt Univ. (USA); **Kensaku Mori**, Nagoya Univ. (Japan); **Parvin Mousavi**, Queen's Univ. (Canada); **Maryam E. Rettmann**, Mayo Clinic (USA); **Frank Sauer**, Siemens Corp., Corporate Technology (USA); **Eric J. Seibel**, Univ. of Washington (USA); **Guy Shechter**, Philips Healthcare (USA); **Amber L. Simpson**, Memorial Sloan-Kettering Cancer Ctr. (USA); **Stefanie Speidel**, Karlsruher Institut für Technologie (Germany); **Andrew D. Wiles**, Northern Digital Inc. (Canada); **Ivo Wolf**, Hochschule Mannheim (Germany); **Ziv R. Yaniv**, National Library of Medicine (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:

- Image-guided procedures
- Minimally invasive surgery
- Computer-assisted therapy and therapy planning
- Robotic interventions and surgical tools
- Localization technologies and navigation systems
- Tracking and calibration
- Intraoperative imaging
- Intraoperative patient-to-image/-model registration
- Mathematical modeling to guide and understand therapy
- Modeling of intraprocedural changes
- Modeling and analysis of procedures and procedure workflows
- Techniques in population-specific and patient-specific model generation
- Image-based models for characterization of tissue and disease properties
- Medical image-based simulation and training
- Validation/evaluation
- 3D visualization
- Novel interfaces for therapy and visualization of data
- Augmented, virtual, and enhanced reality
- Clinical applications and technology integration
- High performance computing for real-time modeling and/or large dataset visualization

- Safety and standards for image-guided and robotic procedures
- Other related areas.

Submissions that cross over between this conference and others at SPIE Medical Imaging, and which would be appropriate for combined sessions, are also welcomed.

AWARDS

Papers from student authors are particularly encouraged; there is a competition for the best student paper, and limited student travel awards are also available. In addition, there is a conference-specific competition, the young scientist award. This is a prize awarded to first authors of high quality papers where the applicant is the first author of a paper and an early career scientist (student, or postdoctoral fellow).

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
- Data integration for the clinic/OR
- Data Science
- Deep Learning
- Diagnosis
- Disease characterization
- Endoscopic procedures
- Enhanced reality
- Human factors
- Image-guided therapy
- Intraoperative imaging
- Localization and tracking technologies
- Medical robotics
- Modeling
- Monitoring and feedback
- Multimodality display
- Neurosurgical procedures
- Pelvic procedures
- Registration
- Segmentation
- Stereoscopic display
- Surgical simulation
- Therapy planning
- Treatment planning
- Ultrasound guidance
- Validation/evaluation
- Visualization

Image Perception, Observer Performance, and Technology Assessment (MI105)

Conference Chairs: **Matthew A. Kupinski**, College of Optical Sciences, The Univ. of Arizona (USA); **Robert M. Nishikawa**, Univ. of Pittsburgh (USA)

Program Committee: **Craig K. Abbey**, Univ. of California, Santa Barbara (USA); **François O. Bochud**, Ctr. Hospitalier Univ. Vaudois (Switzerland); **Jovan G. Brankov**, Illinois Institute of Technology (USA); **Alastair G. Gale**, Loughborough Univ. (United Kingdom); **Howard C. Gifford**, Univ. of Houston (USA); **Stephen L. Hillis**, The Univ. of Iowa (USA); **Elizabeth A. Krupinski**, The Univ. of Arizona (USA); **Maciej A. Mazurowski**, Duke Univ. (USA); **Anthony J. Maeder**, The Univ. of Western Australia (Australia); **Mark F. McEntee**, The Univ. of Sydney (Australia); **Claudia R. Mello-Thoms**, The Univ. of Sydney (Australia), Univ. of Pittsburgh (USA); **Subok Park**, U.S. Food and Drug Administration (USA); **Ljiljana Platisa**, Univ. Gent (Belgium); **Frank W. Samuelson**, U.S. Food and Drug Administration (USA); **Sian Taylor-Phillips**, The Univ. of Warwick (United Kingdom); **Pontus A. Timberg**, Scania Univ. Hospital (Sweden); **David L. Wilson**, Case Western Reserve Univ. (USA)

This conference focuses on a broad understanding of medical image perception, observer-performance assessment, 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; perceptual factors that affect the diagnostic process; eye-movement studies; observer performance methodologies; human-computer interaction; medical 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
- Visual search of medical images
- 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

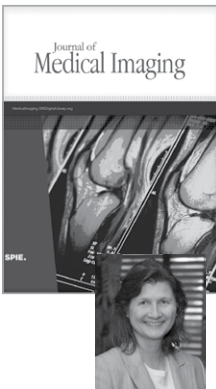
To assist the reviewers, choose up to three keywords in order of relevance from the following list.

- Image Display
- Image Perception
- Observer Performance Evaluation
- ROC Methodology
- Model Observers
- Technology Assessment
- Technology Impact

Journal of
Medical Imaging

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AIMS AND SCOPE

The *Journal of Medical Imaging* covers fundamental and translational research and applications focused on photonics in medical imaging, which continue to yield physical and biomedical advancements in the early detection, diagnostics, and therapy of disease, as well as in the understanding of normal.

JMI provides a home for the peer-reviewed communication and archiving of scientific developments, translational and clinical applications, reviews, and recommendations for the field.

Maryellen Giger, Editor-in-Chief, is the A. N. Pritzker Professor of Radiology/Medical Physics at The University of Chicago. She received her PhD in medical physics at The University of Chicago.

Biomedical Applications in Molecular, Structural, and Functional Imaging (MI106)

Conference Chairs: **Barjor Gimi**, Geisel School of Medicine at Dartmouth (USA); **Andrzej Krol**, SUNY Upstate Medical Univ. (USA)

Program Committee: **Amir A. Amini**, Univ. of Louisville (USA); **Juan R. Cebal**, George Mason Univ. (USA); **Alejandro F. Frangi**, The Univ. of Sheffield (United Kingdom); **Xavier Intes**, Rensselaer Polytechnic Institute (USA); **Vikram Kodibagkar**, Arizona State Univ. (USA); **Changqing Li**, Univ. of California, Merced (USA); **Armando Manduca**, Mayo Clinic College of Medicine (USA); **Robert C. Molthen**, GE Healthcare (USA), Marquette Univ. (USA) and Medical College of Wisconsin (USA); **Nicholas J. Tustison**, Univ. of Virginia (USA); **John B. Weaver**, Dartmouth Hitchcock Medical Ctr. (USA); **Axel Wismüller**, Univ. of Rochester Medical Ctr. (USA); **Baohong Yuan**, The Univ. of Texas at Arlington (USA)

This conference will cover all aspects of observing, 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, processing, analysis, registration, modeling
- Preclinical imaging, small animal imaging, molecular imaging, fluorescence tomography, bioluminescence tomography, x-ray phase contrast tomography, photoacoustic tomography, Cerenkov luminescence imaging, X-ray fluorescence computed tomography (XFCT)
- Multimodality imaging, hybrid imaging
- Nanoparticle, biosensors and magnetic particle imaging (MPI)
- Optical, electrical impedance, terahertz or microwave imaging
- Pulmonary structure and function: perfusion, ventilation, mechanics, and modeling
- Vessel and airway imaging: detection, modeling, trees, reactivity, blood flow, perfusion
- Cardiac structure and function: perfusion, modeling, electrophysiology
- Functional neuroimaging and brain imaging, fMRI, fcMRI, PET, SPECT
- Magnetic resonance imaging (MRI)
- MRI quantitation of fat, diffusion and CEST
- Soft tissue imaging: deformation, quantification, segmentation, detection, analysis
- Breast imaging
- Bone and skeletal imaging: micro-structure, orthopedic, finite-element models
- Biomechanical imaging and modeling

- Nuclear medicine: PET, SPECT, molecular breast imaging (MBI), molecular brain imaging, scintigraphy, Cerenkov luminescence imaging
- Novel physiological imaging agents/probes: quantum dots, nanoparticles, radiopharmaceuticals
- 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
- Novel imaging methods
- Neuroimaging, neurochemistry, brain mapping, fMRI, brain PET, brain SPECT
- Optical imaging
- Vascular imaging
- Breast imaging
- Bone and skeletal imaging, biomechanics
- Cardiac imaging and cardiomechanical modeling
- Imaging agents/molecular probes: receptor-ligand binding / pharmacokinetic models
- Pulmonary structure and function: perfusion, ventilation, mechanics, segmentation, and modeling
- Image processing, detection, segmentation, registration, and analysis for quantifying and modeling molecular, structural and functional parameters
- Magnetic particle imaging (MPI)
- Nanoparticle imaging: sensing/therapy

IMPORTANT DATES

Abstracts Due:

22 JULY 2016

Author Notification:

10 OCTOBER 2016

The contact author will be notified of abstract acceptance by email.

Manuscripts Due:

16 JANUARY 2017

PLEASE NOTE: Submissions imply the intent of at least one author to register, attend the conference, present the paper as scheduled, and submit a manuscript for publication in the conference proceedings in the SPIE Digital Library.

Imaging Informatics for Healthcare, Research, and Applications (MI107)

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

Program Committee: **Peter R. Bak**, McMaster Univ. (Canada); **Po-Hao Chen M.D.**, The Univ. of Pennsylvania Health System (USA); **Thomas M. Deserno**, RWTH Aachen (Germany); **Steven C. Horii**, The Univ. of Pennsylvania Health System (USA); **Maria Y. Law**, Hong Kong Sanatorium and Hospital (Hong Kong, China); **Heinz U. Lemke**, Computer Assisted Radiology and Surgery (Germany); **Brent J. Liu**, The Univ. of Southern California (USA); **Eliot L. Siegel**, Univ. of Maryland Medical Ctr. (USA); **Wyatt Tellis**, Univ. of California, San Francisco (USA)

Imaging informatics is a multidisciplinary field and research in the field emphasized the development and evaluation of novel and efficient means of extracting and transforming data from medical images, imaging reports and electronic health records, to improve patient care and patient outcomes. Advances in the field have substantial implications in diagnosing and tracking disease response, optimizing treatment, tracking disease response, and predicting outcomes. In the era of advanced imaging modalities, increasing data complexity, and new payment models based on quality and outcomes, there is need for more efficient workflows and more sophisticated analytics. In addition, the growing demand for personalized, precision medicine requires integration of clinical information, molecular and genomic data, imaging results and pathology. This integration offers the opportunity for innovative approaches towards aggregation, transfer, manipulation, analysis and visualization of biomedical data. Imaging informatics can also bridge the gaps between basic science, clinical practice and diagnosis and therapeutics and rehabilitation. This track focuses on new methods for obtaining, transferring, managing and analyzing data for healthcare and biomedical applications. It supports new technical solutions that can accommodate the needs of all imaging-rich clinical specialties, not just radiology. The conference will include, but is not limited to, the following themes:

THEME 1: Big Data Technologies and Applications in Healthcare Imaging and Biomedical Research

Medical imaging practice and research activities generate big data, not only because of its sheer volume, but also due to the velocity of change, diversity, and the variable veracity of the data. Big data in medical imaging has features that greatly impact its scalability, heterogeneity, availability, storage, and processing, as well as the clinical utility and accessibility of the data for medical practice. New research, technical solutions, clinical challenges and experiences surrounding big data in medical imaging will be included in this theme. These include report data and workflow management, business intelligence, systems integration and standards, quantitative analysis, high-dimensional databases for medical and biomedical applications, image content-based indexing and searching, data mining and image-based patient-specific data modeling.

THEME 2: Imaging Informatics for Diagnostics and Therapeutic Applications

Imaging informatics often requires analysis and manipulation of rich multimedia datasets for a variety of diagnostic, therapeutic and rehabilitative applications. In addition, the DICOM standard has broadened its scope of interoperability to include use cases within radiation oncology, optical imaging and digital pathology. This allows for the advancement of research for both pre-clinical and post-clinical applications. Research topics that bridge the gaps between research, diagnosis, and treatment are encouraged. Image-intensive diagnostic and therapeutic applications (e.g., surgery, radiation therapy, chemotherapy, and rehabilitation) that promote personalized medicine will also be encouraged in this theme.

THEME 3: Imaging Informatics for Precision Medicine

Precision medicine involves using detailed, patient-specific molecular, genetic and imaging information to diagnose and categorize disease, then guide treatment to improve clinical outcome. The combination of medical imaging, genomics and molecular markers presents a new opportunity to link observations made at the cellular or molecular levels to macroscopic phenotypes. Research related to the correlation of genomic information and quantitative imaging biomarkers, linking anatomic structure with functional information at the molecular or cellular level as well as other imaging informatics research for precision medicine will be included in this theme. Innovation that tailors medical treatment to the individual characteristics of each patient based on molecular diagnostics, imaging and analytics, is also welcome in this theme.

THEME 4: Innovation, Research and Applications in Radiological Imaging Informatics

Leading tomorrow's new exponential growth in medical imaging begins with tackling today's unsolvable problems. In medical imaging informatics, innovation bridges the gap between scientific breakthrough and practical problems by combining research, technology, data, and expertise. Today's radiology practices face a mounting pressure to create and measure value - right imaging choice to the right patient at the right time, all the while managing ever-increasing imaging volume. To deliver value, radiologists require tools that aid their efficient assessment of the patient's history, laboratory, prior imaging, and pathology as part of each imaging procedure. Practical solutions that apply informatics tools, such as natural language processing, machine learning, business intelligence solutions, and distributed computing to tackle practical problems in clinical radiology, are welcome in this theme.

(MI107 continued next page)

Imaging Informatics for Healthcare, Research, and Applications (MI107 continued)

THEME 5: Image Sharing for Healthcare Information Exchange and Research

Imaging data are a core element of the patient's longitudinal health record. Sharing these data among members of the care team allows for higher quality medical practice. New technologies and standards have emerged to support the discovery, distribution and display of imaging data over the Internet. Cloud computing and the ubiquity of mobile devices necessitates redefining RIS and PACS, and acknowledging the need for more complex security and access control, as well as reliable, real-time performance over high latency networks. Any research, technology and clinical applications related to mobile image viewing applications, streaming protocols for diagnostic images, network security, and RIS/PACS architecture for the cloud, are welcome in this theme.

THEME 6: Collaboration for Medical Imaging, Research and Applications

Modern medicine increasingly depends on efficient collaboration between radiologists, physicians, and patients. Collaboration is commonplace in the consumer market, where numerous social media platforms exist and are universally accessible. However, the culture and technology of digital collaboration has been slower to permeate the healthcare setting. There is a demand for new applications and a change in workflow to better integrate radiology into shared decision-making between patients and providers. Any research, technology and clinical applications related to collaboration, unified communication and social media for medical imaging, are welcome in this theme.

THEME 7: Surgical PACS and the Digital Operating Room (DOR)

Topics in the session on surgical PACS and the Digital Operating Room will include: pre-operative image integration, intra-operative image acquisition, navigated control, intelligent cameras and surgical instruments, workflow management, DOR process redesign with EMR and signal integration, smart walls including n-dimensional visualization, model guided intervention, vendor independent integration of DOR technologies, interoperability, knowledge and decision management, clinical quantitative and statistical assessment of therapeutic outcomes, intelligent infrastructure and processes, surgical cockpit systems, surgical process repositories, full voice/gesture control, real-time CAD integration and intelligent (situation aware) robotic devices. DICOM in surgery and IHE integration profiles for surgery and pathology will also be welcome.

THEME 8: 3-D Printing for Medical Applications

As technology for 3-D printing has evolved in recent years, new clinical applications are arising rapidly. Surgical planning for complex congenital heart disease and scaffolds on which grafts and tissue-based replacements can be grown represent just two of many recent applications. This topic welcomes novel applications of 3-D printing, including more efficient model generation, image processing to improve model production, dynamic models, biological materials and scaffolds, and workflow development to support 3-D printing.

THEME 9: Image Acquisition, Communication, Display, Standardization and Applications for Non-radiology Images

Image data generated in cardiology, endoscopy, ophthalmology, dermatology, and surgery has been widely used in screening, diagnosis, treatment and rehabilitation, and often becomes part of the electronic medical record. Compared to radiology-centric imaging practices, the data acquisition methods, workflow operations and management of these non-radiological images are quite different. As such, clinical practices, research and applications within image data acquisition, transmission, management, systems integration, standardization, image processing and quantitative analysis for non-radiological images and imaging informatics for translational research will be included in this theme.

THEME 10: Imaging Informatics Support for Translational Research: Challenges of Research Workflow and Diverse Image Types

Imaging for translational research differs from clinical radiology in many ways. The imaged research subject may not be human and may not have typical identifiers. Research subjects do not receive imaging orders and often do not have a complete history corresponding with electronic medical records. Furthermore, some research imaging equipment generates DICOM-incompatible outputs and cannot be stored in standard PACS without conversion. Yet research imaging paves the way for innovations, and compatibility between the two sets streamline clinical translation of results. Informatics research and solutions tackling these challenges are welcome in this theme.

THEME 11: Realities of Imaging Economics: Informatics and the End of Fee-for-Service Imaging Practice

Capitated healthcare payment systems are already in effect and accountable care organizations are advancing this into the outpatient realm. With new payment models based on quality, outcomes, and active participation in patient care, the specialty of radiology is at risk unless it adapts and understands how reimbursements would take place in this framework and how the practice model must adapt to fit these new strategies. For example, in the new scheme, one may get reimbursed for NOT doing a study because it is not appropriate for the patient. Healthcare systems that have been practicing under capitated or single-payer reimbursement (mostly outside of the US) could provide some insight into how these models work. Research or knowledge that can model potential strategies is welcome under this theme.

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:

- Big data technologies and applications in medical imaging and informatics
- Imaging informatics for diagnostics and therapeutic applications
- Imaging informatics for precision medicine and quantitative imaging
- Innovation, research and applications in radiological imaging informatics
- 3D printing for medical applications
- Surgical PACS and the digital operating room (DOR)
- Image sharing for healthcare information exchange and biomedical research
- Cloud computing technology and applications for medical imaging
- Mobile devices for imaging services and applications
- Collaboration for medical imaging and applications
- Image acquisition, communication, display, standardization and applications for non-radiology images
- Imaging informatics support for translational research
- Informatics for new trends in imaging economics

IMPORTANT DATES

Abstracts Due:

22 JULY 2016

Author Notification:

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The contact author will be notified of abstract acceptance by email.

Manuscripts Due:

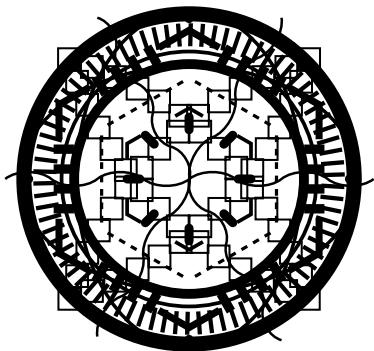
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Ultrasonic Imaging and Tomography ^(M1108)

Conference Chairs: **Neb Duric**, Delphinus Medical Technologies (USA); Barbara Ann Karmanos Cancer Institute (USA); **Brecht Heyde**, Univ. of Leuven (Belgium); Duke Univ. (USA)

Program Committee: **Mark A. Anastasio**, Washington Univ. in St. Louis (USA); **Jeffrey C. Bamber**, The Royal Marsden NHS Foundation Trust (United Kingdom); **Johan G. Bosch**, Erasmus Univ. Rotterdam (Netherlands); **Brett C. Byram**, Vanderbilt Univ. (USA); **Jan D'hooge**, Univ. of Leuven (Belgium); **Marvin M. Doyley**, Univ. of Rochester (USA); **Stanislav Y. Emelianov**, The Univ. of Texas at Austin (USA); **Mostafa Fatemi**, Mayo Clinic College of Medicine (USA); **Aaron Fenster**, Robarts Research Institute (Canada); **Jérémie Fromageau**, The Institute of Cancer Research (United Kingdom); **James F. Greenleaf**, Mayo Clinic (USA); **Emma J. Harris**, The Institute of Cancer Research (United Kingdom); **Martin Christian Hemmsen**, Technical Univ. of Denmark (Denmark); **Michael Jaeger**, Univ. Bern (Switzerland); **Jørgen Arendt Jensen**, Technical Univ. of Denmark (Denmark); **David H. Kim**, Analogic Corp. (USA); **Roman G. Maev**, Univ. of Windsor (Canada); **Stephen A. McAleavey**, Univ. of Rochester (USA); **Mohammad Mehrmohammadi**, Wayne State Univ. (USA); **Serge Mensah**, Aix-Marseille Univ. (France); **Svetoslav I. Nikolov**, BK Medical (Denmark); **Olivier Roy**, Karmanos Cancer Institute (USA); **Nicole V. Ruiter**, Karlsruher Institut für Technologie (Germany); **Kai E. Thomenius**, Massachusetts Institute of Technology (USA); **William F. Walker**, Univ. of Virginia (USA)

This conference provides a forum for in-depth discussions of all aspects related to medical ultrasound engineering, imaging and clinical applications. We are soliciting original contributions related to the following topics: physics of ultrasound wave propagation, image reconstruction techniques, hardware and system design, ultrasound image analysis strategies, ultrasound functional imaging, contrast agents and biological and biomedical applications of new ultrasound imaging modalities.

A joint session with the Image-Guided Procedures, Robotic Interventions, and Modeling conference will be held in order to have a high-level discussion on the state-of-the-art in ultrasound guidance of surgical 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 simulations
- Transducer design
- Novel beamforming techniques
- Ultrasound tomography and reconstruction
- Tissue characterization
- Elastography
- Motion and deformation imaging
- Blood flow imaging
- Contrast imaging
- Ultrafast imaging
- Shear-wave imaging
- High frequency imaging
- Ultrasound image analysis
- Photoacoustic imaging
- Acoustic microscopy
- Ultrasound therapeutics
- Ultrasound procedure guidance
- New applications of ultrasound in medicine and biology



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Digital Pathology (MI109)

Conference Chairs: **Metin N. Gurcan**, The Ohio State Univ. Wexner Medical Ctr. (USA); **John E. Tomaszewski**, Univ. at Buffalo (USA)

Program Committee: **Selim Aksoy**, Bilkent Univ. (Turkey); **Ulysses J. Balis**, Univ. of Michigan Health System (USA); **Rohit Bhargava**, Univ. of Illinois at Urbana-Champaign (USA); **Ulf-Dietrich Braumann**, Hochschule für Technik, Wirtschaft und Kultur Leipzig (Germany); **Eric Cosatto**, NEC Labs. America, Inc. (USA); **Scott Doyle**, Rutgers, The State Univ. of New Jersey (USA); **Michael D. Feldman**, The Univ. of Pennsylvania Health System (USA); **David J. Foran**, Rutgers Cancer Institute of New Jersey (USA); **Brandon D. Gallas**, U.S. Food and Drug Administration (USA); **Marios A. Gavrielides**, U.S. Food and Drug Administration (USA); **Tom R. L. Kimpe**, Barco N.V. (Belgium); **Elizabeth A. Krupinski**, The Univ. of Arizona (USA); **Richard M. Levenson**, Univ. of California, Davis (USA); **Olivier Lezoray**, Univ. de Caen Basse-Normandie (France); **Anant Madabhushi**, Case Western Reserve Univ. (USA); **Derek R. Magee**, Univ. of Leeds (United Kingdom); **Anne L. Martel**, Sunnybrook Research Institute (Canada); **Erik Meijering**, Erasmus MC (Netherlands); **James P. Monaco**, Inspirata, Inc. (USA); **Mehdi Moradi**, IBM Research - Almaden (USA); **Bahram Parvin**, Lawrence Berkeley National Lab. (USA); **Josien P. W. Pluim**, Image Sciences Institute (Netherlands); **Nasir M. Rajpoot**, Qatar Univ. (Qatar); **Gustavo Kunde Rohde**, Carnegie Mellon Univ. (USA); **Berkman Sahiner**, U.S. Food and Drug Administration (USA); **Chukka Srinivas**, Ventana Medical Systems, Inc. (USA); **Darren Treanor**, Univ. of Leeds (United Kingdom); **Jeroen van der Laak**, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Aaron D. Ward**, The Univ. of Western Ontario (Canada); **Martin J. Yaffe**, Sunnybrook Research Institute (Canada); **Bülent Yener**, Rensselaer Polytechnic Institute (USA)

This conference will address digital pathology, from acquisition of pathology data to its management, analysis, and interpretation by observers. The use of digital pathology data, by both the human and computer, is growing in importance with the recent advances in whole slide scanners and novel instrumentation for multispectral, multiparametric tissue imaging. There is evidence that digital pathology can improve diagnosis and grading of cancer and other pathology tasks, but there are still limitations and challenges that must be addressed before it can be fully incorporated in the clinical workflow.

Although there has been great progress in the development and application of digital pathology over recent years, there are a number of significant computational challenges specific to pathology imaging that distinguish it from its radiological counterpart. There are also unique challenges in terms of how digitized pathology specimens and correlated data are presented to, modified and interpreted by clinicians and computers.

We invite submissions that address specific problems related to image acquisition, display, interpretation, computer-aided diagnosis, and quantitative image analysis of pathology specimens. We particularly welcome contributions that identify and address challenges encountered in digital pathology imaging as well as in new approaches for image capture and analysis.

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 ACQUISITION, STORAGE AND DISPLAY

- Acquisition, storage, display and processing of digital microscopy images
- Image mosaicking of nontraditional near-real-time microscopy (OCT, confocal)
- Multispectral imaging
- High-dimensional multiplexed staining and imaging of tissues
- Multi-focus volume imaging
- Compression
- Methodologies for the objective technical assessment of digital pathology systems
- Whole slide imaging

QUANTITATIVE IMAGE ANALYSIS

- Computer-aided diagnosis, prognosis and predictive analysis
- Automated quantification of tissue biomarkers
- Grading and classification of pathology images
- Segmentation of cellular and tissue structures
- Shape analysis and morphology in pathology imaging
- Architectural feature extraction and quantification
- Multispectral- and volume-based segmentation
- Content-based image retrieval
- High-performance computing for whole-slide tissue image analysis
- Multiple marker co-expression analysis
- Spectral unmixing and signal processing methods
- Multi-stain and multiplexed image analysis

INFORMATION FUSION

- Radiology-pathology registration and fusion
- Registration of multiple stained tissue microscopy images
- Integration of digital image features with 'omics' data for fused diagnostics

DIGITAL PATHOLOGY AND THE PATHOLOGIST

- Observer performance, human factors and diagnostic interpretation issues
- Remote consultation
- Metrics, variability and standardization issues unique to digital pathology
- Methodologies for the objective technical assessment of digital pathology systems
- Optical probe tracking and visualization tools
- PACS and new DICOM standards for histopathology
- Color calibration, conversion

General Information

VENUE

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Opening of the hotel reservation process for SPIE Medical Imaging 2017 is scheduled for the beginning of October 2016. SPIE will arrange special discounted hotel rates for SPIE conference attendees.

The website will be kept current with any updates.

STUDENT TRAVEL GRANTS

A limited number of SPIE student travel grants will be awarded based on need. Applications must be received no later than 25 November 2015. 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.

REGISTRATION

SPIE Medical Imaging registration will be available October 2016

All participants, including invited speakers, contributed speakers, session chairs, co-chairs, and committee members, must pay a registration fee. Authors, coauthors, program committee members, and session chairs are accorded a reduced symposium registration fee.

Fee information for conferences, courses, a registration form, and technical and general information will be available on the SPIE website in October 2016.

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If government and/or company clearance is required to present and publish your presentation, start the process now to ensure that you receive clearance if your paper is accepted.

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- Once you choose a conference, click "Submit an abstract" from the conference call for papers.
- 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
- 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.
- **A FOCUS ON PRECISION MEDICINE:** An emerging approach for disease treatment and prevention that takes into account individual variability in genes, environment, and lifestyle for each person will be highlighted in this year's program. Information regarding the Precision Medicine Initiative is available at: www.whitehouse.gov/precision-medicine. **If your paper is related to this research, please enter the words "Precision Medicine" on the overview page of your submission in the space provided.** Papers related to this research will be highlighted in the Technical Program.

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 **10 October 2016**.
- Final placement in an oral or poster session is subject to the Chairs' discretion.

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- Image Perception, Observer Performance, and Technology Assessment
- Biomedical Applications in Molecular, Structural, and Functional Imaging
- Imaging Informatics for Healthcare, Research, and Applications
- Ultrasonic Imaging and Tomography
- Digital Pathology



Student Paper Awards

ATTENTION STUDENTS
See web for submission instructions and eligibility requirements for the 2017 awards. Submission instructions and eligibility requirements for the 2017 All Conference Best Student Paper Awards will be available in October 2017.

See 2016 Award Winners
www.spie.org/awards2016



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