

Medical Imaging 2020

Physics of Medical Imaging

Guang-Hong Chen

Hilde Bosmans

Editors

16–19 February 2020

Houston, Texas, United States

Sponsored by

SPIE

Cooperating Organizations

AAPM—American Association of Physicists in Medicine (United States)

MIPS—Medical Image Perception Society (United States)

SIIM—Society for Imaging Informatics in Medicine (United States)

IFCARS—International Foundation for Computer Assisted Radiology and Surgery (Germany)

WMIS—World Molecular Imaging Society

Published by

SPIE

Volume 11312

Part One of Two Parts

Proceedings of SPIE, 1605-7422, V. 11312

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

Medical Imaging 2020: Physics of Medical Imaging, edited by Guang-Hong Chen, Hilde Bosmans, Proc. of SPIE
Vol. 11312, 1131201 · © 2020 SPIE · CCC code: 1605-7422/20/\$21 · doi: 10.1117/12.2570912

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIDigitalLibrary.org.

The papers reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Medical Imaging 2020: Physics of Medical Imaging*, edited by Guang-Hong Chen, Hilde Bosmans, Proceedings of SPIE Vol. 11312 (SPIE, Bellingham, WA, 2020) Seven-digit Article CID Number.

ISSN: 1605-7422
ISSN: 2410-9045 (electronic)

ISBN: 9781510633919
ISBN: 9781510633926 (electronic)

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445
SPIE.org

Copyright © 2020, Society of Photo-Optical Instrumentation Engineers.

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is \$21.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 1605-7422/20/\$21.00.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

Publication of record for individual papers is online in the SPIE Digital Library.

**SPIE. DIGITAL
LIBRARY**

SPIDigitalLibrary.org

Paper Numbering: *Proceedings of SPIE* follow an e-First publication model. A unique citation identifier (CID) number is assigned to each article at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc. The CID Number appears on each page of the manuscript.

Contents

xvii	<i>Authors</i>
xxiii	<i>Conference Committee</i>
xxvii	<i>2020 Medical Imaging Award Recipients</i>

Part One

NEW TECHNOLOGIES IN IMAGING

11312 02	A new concept for fluence field modulation in x-ray CT: the z-sbDBA [11312-2]
11312 03	C-arm CT imaging using the extended line-ellipse-line trajectory: seamless FBP reconstruction from real data [11312-3]
11312 04	Preliminary imaging evaluation of a compact tomosynthesis system for potential point-of-care extremity imaging [11312-4]
11312 05	Slot-scan dual-energy measurement of bone mineral density on a robotic x-ray system [11312-5]

CT RECONSTRUCTION WITH DL TECHNIQUES

11312 06	Deep learning enabled prior image constrained compressed sensing (DL-PICCS) reconstruction framework for sparse-view reconstruction [11312-6]
11312 07	Generalized iterative sparse-view CT reconstruction with deep neural network [11312-7]
11312 08	A deep learning reconstruction method for sparsely spaced multidetector helical CT using cascaded dual-domain CNN [11312-8]
11312 09	Ultra-fast-pitch acquisition and reconstruction in helical CT [11312-9]
11312 0A	Fast spectral x-ray CT reconstruction with data-adaptive, convolutional regularization [11312-10]
11312 0B	Semi-supervised learned sinogram restoration network for low-dose CT image reconstruction [11312-11]

PHOTON COUNTING DETECTORS

- 11312 0C **Multi-energy inter-pixel coincidence counters for charge sharing correction and compensation for photon counting detectors: assessment at a normalized spatial resolution** [11312-12]
- 11312 0D **A study of energy resolution in CPD indirect photon-counting x-ray imaging** [11312-13]
- 11312 0E **1 μm spatial resolution in silicon photon-counting CT detectors by measuring charge diffusion** [11312-14]
- 11312 0F **Hybrid energy integrating and photon counting micro-CT** [11312-15]
- 11312 0G **Performance of amorphous selenium-based unipolar charge sensing detector for photon counting x-ray imaging** [11312-16]

QUALITY ASSESSMENT AND OPTIMIZATION IN BREAST IMAGING

- 11312 0H **Factors affecting microcalcification detection of wide-angle digital breast tomosynthesis and strategies for improving performance** [11312-17]
- 11312 0I **Determining the optimal angular range of the x-ray source motion in tomosynthesis using virtual clinical trials** [11312-18]
- 11312 0J **Evaluation of possible phantoms for assessment of image quality in synthetic mammograms** [11312-19]
- 11312 0K **Equivalent breast thickness and dose sensitivity of a next iteration 3D structured breast phantom with lesion models** [11312-20]
- 11312 0L **High resolution microcalcification signal profiles for dedicated breast CT** [11312-21]
- 11312 0M **Classification of breast calcifications in dual-energy FFDM using a convolutional neural network: simulation study** [11312-22]

BREAST IMAGING: NEW TECHNOLOGY

- 11312 0O **Volumetric breast density estimation using dual energy digital breast tomosynthesis** [11312-24]
- 11312 0P **An investigation of slot-scanning for mammography and breast CT** [11312-25]
- 11312 0Q **Deep convolutional neural network denoising for digital breast tomosynthesis reconstruction** [11312-26]

11312 OR **Modelling the use of stationary, rectangular arrays of x-ray emitters for digital breast tomosynthesis** [11312-27]

INNOVATIONS IN NUCLEAR MEDICINE AND MRI

11312 OT **An assessment of PET dose reduction with penalized likelihood image reconstruction using a computationally efficient model observer** [11312-29]

11312 OU **Joint low-count PET/CT segmentation and reconstruction with paired variational neural networks** [11312-30]

11312 OV **Medical image reconstruction with image-adaptive priors learned by use of generative adversarial networks** [11312-31]

11312 OW **Quality assessment of brain MRI scans using a dense neural network model and image metrics** [11312-32]

DETECTOR TECHNOLOGIES

11312 OX **Initial characterization of a hybrid direct-indirect active matrix flat panel imager for digital radiography** [11312-33]

11312 OY **The effect on patient dose and image quality of simultaneous acquisition of high-resolution small field of view (FOV) and regular-resolution large FOV imaging modes of a dual-resolution imaging detector** [11312-34]

11312 OZ **Analogous Lubberts effect in photon counting detectors** [11312-35]

11312 10 **Theoretical performance of polycrystalline mercuric iodide x-ray converters incorporating pillar-supported Frisch grid structures** [11312-36]

11312 11 **Novel irradiation side sampling system flexible flat panel detectors with high image quality and light weight** [11312-37]

11312 12 **Pixelated columnar CsI:Tl scintillator for high resolution radiography and cone-beam CT** [11312-38]

TARGET: CONTRAST AGENT IMAGING OPTIMIZED

11312 14 **Patient-informed modelling of hepatic contrast dynamics in contrast-enhanced CT imaging** [11312-40]

11312 15 **Contrast flow velocity quantification from time-resolved CT angiography: a phantom study** [11312-41]

- 11312 16 **Power injector for angiographic flow analysis using custom contrast density profiles**
[11312-42]
- 11312 17 **Simulation of contrast agent dynamics in digital brain phantom for CT perfusion optimization**
[11312-43]
- 11312 18 **Combining spectral CT acquisition methods for high-sensitivity material decomposition**
[11312-44]

X-RAY PHASE CONTRAST IMAGING

- 11312 1A **A preclinical large-field-of-view x-ray multi-contrast lung imaging prototype** [11312-46]
- 11312 1B **Phase contrast CT enabled three-material decomposition in spectral CT imaging (Second Place: Robert F. Wagner Best Student Paper Award and Physics of Medical Imaging Student Paper Award)** [11312-47]
- 11312 1C **Low dose and high SNR phase retrieval and micro CT using a wide area photon counting detector** [11312-48]
- 11312 1E **Reducing the x-ray phase contrast image bias via deep computed signal estimation technique** [11312-50]

PHOTON COUNTING CT APPLICATIONS

- 11312 1F **Spectral CT metal artifact reduction using weighted masking and a one step direct inversion reconstruction algorithm** [11312-51]
- 11312 1G **Bone density quantification via material decomposition in an arthritic mouse model using photon counting spectral CT** [11312-52]
- 11312 1H **A new series expansion method and its application to photon-counting CT reconstruction**
[11312-53]
- 11312 1I **Development of a spectral micro-CT system using a photon counting detector with anti-coincidence corrections** [11312-54]
- 11312 1J **Impact of photon counting detector spectral distortion on virtual non-contrast CT imaging**
[11312-55]

CBCT RECONSTRUCTION TECHNIQUES

- 11312 1K **High temporal resolution time-resolved C-arm cone-beam CT imaging using a multi-sweep data acquisition scheme** [11312-56]
- 11312 1L **Deep learning-aided CBCT image reconstruction of interventional material from four x-ray projections** [11312-57]

- 11312 1M **Estimation of local deformable motion in image-based motion compensation for interventional cone-beam CT** [11312-58]
- 11312 1N **An improved combination of ordered subsets and momentum for fast model-based iterative CT reconstruction** [11312-59]

SPECTRAL CT NEW HARDWARE

- 11312 1O **Dual layer x-ray detector simulation** [11312-60]
- 11312 1P **Spectral modulator with flying focal spot for cone-beam CT: a feasibility study** [11312-61]
- 11312 1Q **Benefit of dual energy CT for lesion localization and classification with convolutional neural networks** [11312-62]
- 11312 1R **Multi-energy CT with triple x-ray beams: a feasibility animal study** [11312-63]
- 11312 1S **Accurate proton stopping power images reconstructed using joint statistical dual energy CT: experimental verification and impact of fan-beam CT scatter** [11312-64]

VIRTUAL IMAGING

- 11312 1T **Virtual imaging trials: an emerging experimental paradigm in imaging research and practice** [11312-65]
- 11312 1U **In vivo noise texture estimation: development and validation of an automated methodology** [11312-66]
- 11312 1V **High-spatial-resolution Monte Carlo simulations of small-animal x-ray fluorescence tomography** [11312-67]
- 11312 1W **Simulation of hepatic arteries and synthesis of 2D fluoroscopic images for interventional imaging studies** [11312-68]
- 11312 1Y **Optimization of energy thresholds in photon-counting CT via a virtual clinical trial** [11312-70]

NEW RECONSTRUCTION TECHNIQUES IN DUAL ENERGY CT

- 11312 1Z **Prospective prediction and control of image properties in model-based material decomposition for spectral CT** [11312-71]
- 11312 20 **Comparative study of dual energy cone-beam CT using a dual-layer detector and kVp switching for material decomposition** [11312-72]

- 11312 21 **Tensor convolutional neural network architecture for spectral CT reconstruction** [11312-73]
- 11312 22 **Feasibility of achieving spectral CT imaging from a single KV acquisition and deep learning method** [11312-74]
- 11312 23 **A cascaded deep-learning reconstruction method for sparse-view kV-switching dual-energy CT** [11312-75]

ARTIFACTS IN CBCT SOLVED

- 11312 24 **Evaluation of patient-specific scatter-corrected digital chest tomosynthesis** [11312-76]
- 11312 25 **Projection-domain metal artifact correction using a dual layer detector** [11312-77]
- 11312 26 **Method for metal artifact avoidance in C-arm cone-beam CT** [11312-78]
- 11312 27 **Non-circular CT orbit design for elimination of metal artifacts** [11312-79]
- 11312 28 **Reduction of ring artifacts caused by 2D anti-scatter grids in flat-panel CBCT** [11312-80]

POSTER SESSION: IMAGING METHODS INCLUDING OPTICAL, MR, AND ULTRASOUND

- 11312 2B **Calibration method of conformal x-ray transmission imaging system based on small ball phantom** [11312-82]
- 11312 2C **Artifact correction for small metals by combining pattern matching and interpolation methods in x-ray** [11312-83]
- 11312 2D **Effect of geometric variations on image characteristics in digital tomosynthesis** [11312-84]
- 11312 2E **Multi-beam x-ray sources with carbon nanotube emitter for tomosynthesis system** [11312-85]
- 11312 2F **High-resolution vascular imaging of small animal using the NIR-IIb window emitted from ICG** [11312-86]
- 11312 2G **Bone health assessment using synthetic aperture ultrasound reflectometry** [11312-87]
- 11312 2H **A finite element mesh regrouping-based hybrid light transport model for enhancing the efficiency and accuracy in bioluminescence tomography** [11312-88]
- 11312 2J **Keratoconus stage impact on visual acuity and contrast sensitivity** [11312-90]
- 11312 2K **4D image construction from free-breathing MRI slice acquisitions of the thorax based on a concept of flux** [11312-91]

POSTER SESSION: MEASUREMENT METHODS

- 11312 2M **Reconstruction of x-ray focal spot distribution using a rotating edge** [11312-93]
- 11312 2N **Image quality assessment of real patient thorax CT images using modulation transfer function and noise power spectrum** [11312-94]
- 11312 2O **A method to assess the performance and the relevance of segmentation in radiomic characterization** [11312-95]
- 11312 2Q **Automatic phantom test pattern classification through transfer learning with deep neural networks** [11312-97]

POSTER SESSION: CONE BEAM CT

- 11312 2R **Displaying information collected by intraoral tomosynthesis as multi-view synthetic radiographs** [11312-98]
- 11312 2S **3D-localization of anatomic structures in tomographic images from optical flow of projection images** [11312-99]
- 11312 2T **Implementation, validation and application of a tool for the assessment of the modulation transfer function and noise power spectrum of dental CBCT scanners** [11312-100]
- 11312 2U **Synthesis of ghost-free panoramic radiographs from dental CBCT images** [11312-101]

Part Two

- 11312 2V **Micro computed tomography system based on field emission x-ray source with carbon nanotube emitter** [11312-103]
- 11312 2W **Simultaneous scatter rejection and correction method using 2D antiscatter grids for CBCT** [11312-104]
- 11312 2X **Projection-based adaptive scatter correction for CT system** [11312-105]

POSTER SESSION: WORK INVOLVING DEVELOPMENT OF PHANTOMS OR ANATOMICAL SIMULATION METHODS

- 11312 2Y **CT phantom with 3D anthropomorphic, contrast-enhanced texture** [11312-106]
- 11312 2Z **Prediction of pleural invasion of lung cancer with dynamic chest radiography: a simulation study** [11312-107]

- 11312 30 **Quantifying motion artifacts using a rotating phantom: insights towards dynamic musculoskeletal applications** [11312-108]
- 11312 31 **Quantitative evaluation of cadaveric contrast agents: identifying anatomical structures with BriteVu** [11312-109]
- 11312 32 **Impact of chromophores on colour appearance in a computational skin model** [11312-110]

POSTER SESSION: NEUROIMAGING

- 11312 33 **Fast and accurate brain T_2 relaxation time quantification in animal models calibrated using gel phantoms and in vivo data suitable for imaging at a biosafety level 4 environment** [11312-111]
- 11312 34 **Physical image simulation of human brain in case of acute stroke** [11312-112]
- 11312 35 **Effect of truncated singular value decomposition on digital subtraction angiography derived angiographic parametric imaging maps** [11312-113]
- 11312 36 **Non-contrast head CT-assisted cerebral CT perfusion imaging** [11312-114]
- 11312 37 **Feasibility of a stationary head CT scanner using a CNT x-ray source array** [11312-115]
- 11312 38 **Simulation and optimization of system configuration for the stationary head CT using CNT x-ray source array: reconstruction and quality evaluation** [11312-116]
- 11312 39 **Quantification of fiber orientation uncertainty in polarized light imaging of the human brain** [11312-117]

POSTER SESSION: IMAGE GUIDED INTERVENTIONS

- 11312 3A **Comparison of the patient's skin dose for flat and curved surfaces as a function of x-ray beam angle of incidence** [11312-118]
- 11312 3B **Evaluation of geometric and exposure parameters used in fluoroscopically-guided neuro-interventional procedures** [11312-119]
- 11312 3C **Methods for object tracking and shadowing in a top-down view virtual reality scattered radiation display system (SDS) for fluoroscopically-guided procedures** [11312-120]
- 11312 3D **Considerations for accurate inclusion of staff member body tracking in a top-down view virtual reality display of a scattered radiation dose map during fluoroscopic interventional procedures** [11312-121]
- 11312 3E **Variation of eye-lens dose with variation of the location of the beam isocenter in the head during neuro-interventional fluoroscopic procedures** [11312-122]

- 11312 3F **Adaptively variable frame-rate fluoroscopy with an ultra-fast digital x-ray tube based on carbon nanotube field electron emitters** [11312-123]
- 11312 3G **Quantitative blood flow imaging with time-resolved C-arm cone-beam CT imaging** [11312-124]
- 11312 3H **Assessment of proton radiographic sensitivity limits for gold nanoparticle tagged tumors using gold leaf phantoms** [11312-125]
- 11312 3I **200 kV x-ray source for radiotherapy and imaging: preliminary results and discussion** [11312-126]
- 11312 3J **Nullspace-constrained modifications of under-sampled interventional CT images using instrument-specific prior information** [11312-127]

POSTER SESSION: IMAGE RECONSTRUCTION INCLUDING CT, SPECT, PET, OCT, AND TOMOSYNTHESIS

- 11312 3K **Accelerated reconstruction for inverse geometry CT via derivative back-projection filtration** [11312-128]
- 11312 3L **Artifacts reduction in 4D-CBCT via a joint free-form registration method of projection match and gradient constraint** [11312-129]
- 11312 3M **A stopping criterion for iterative reconstruction of x-ray computed tomography** [11312-130]
- 11312 3N **Micro-CT imaging of super-resolution MBIR algorithm based on sub-pixel displacement** [11312-131]
- 11312 3O **Low-dose digital tomosynthesis reconstruction based on field emission flat-panel x-ray source array** [11312-132]
- 11312 3P **Automatic geometric calibration in 3D parallel geometry** [11312-133]
- 11312 3Q **Model-based material decomposition with system blur modeling (Cum Laude Poster Award)** [11312-134]
- 11312 3R **Rotating projection based localizer radiograph which enables multiple pre-scan function for CT** [11312-135]
- 11312 3S **Single scan dual energy cone beam CT using a rotating filter** [11312-136]
- 11312 3T **Average consistency: a superior way of using the composite image to boost dynamic CT reconstruction** [11312-137]

POSTER SESSION: DETECTOR TECHNOLOGY: SCINTILLATORS, PHOTOCONDUCTORS, DIODES, AND TFT

- 11312 3W **Analysis of a new indium gallium zinc oxide (IGZO) detector** [11312-140]

- 11312 3X **The effects of x-ray irradiation on a-IGZO TFTs used for active pixel sensor** [11312-141]
- 11312 3Y **Response of CZT pixels to parallel and oblique x-rays** [11312-142]
- 11312 3Z **Extended dynamic range CMOS active pixel architecture for x-ray detectors** [11312-143]

POSTER SESSION: MACHINE LEARNING APPLIED TO IMAGING PHYSICS

- 11312 40 **Combined spatial and temporal deep learning for image noise reduction of fluoroscopic x-ray sequences** [11312-145]
- 11312 41 **Low-dose CT reconstruction with simultaneous sinogram and image domain denoising by deep neural network** [11312-146]
- 11312 42 **Progressive transfer learning strategy for low-dose CT image reconstruction with limited annotated data** [11312-147]
- 11312 43 **Deep neural networks for low-dose CT image reconstruction via cooperative meta-learning strategy** [11312-148]
- 11312 44 **Semi-supervised noise distribution learning for low-dose CT restoration** [11312-149]
- 11312 45 **Simultaneous denoising and spatial resolution enhancement using convolutional neural network-based linear model in diagnostic CT images** [11312-150]
- 11312 46 **Construction of virtual normal dose CT images from ultra-low dose CT images using dilated residual networks** [11312-151]
- 11312 47 **Low dose PET imaging with CT-aided cycle-consistent adversarial networks** [11312-152]
- 11312 48 **Attenuation correction for PET/MRI using MRI-based pseudo CT** [11312-153]
- 11312 49 **PET attenuation correction using non-AC PET-based synthetic CT** [11312-154]
- 11312 4A **Prior knowledge driven machine learning approach for PET sinogram data denoising** [11312-155]
- 11312 4B **Non-local texture learning approach for CT imaging problems using convolutional neural network** [11312-156]
- 11312 4C **Dual-energy CT reconstruction using deep mutual-domain knowledge for basis decomposition and denoising** [11312-157]
- 11312 4D **Unsupervised data fidelity enhancement network for spectral CT reconstruction** [11312-158]
- 11312 4E **Pixel-defect corrections for radiography detectors based on deep learning** [11312-159]

- 11312 4F **Development of a denoising convolutional neural network-based algorithm for metal artifact reduction in digital tomosynthesis** [11312-160]
- 11312 4H **Correction for cone beam CT image artifacts via a deep learning method** [11312-162]
- 11312 4I **Reduction of truncation artifact in stationary inverse-geometry digital tomosynthesis using convolutional neural network** [11312-163]
- 11312 4J **Iterative reconstruction of cone-beam breast CT using plug-and-play projected gradient descent** [11312-164]
- 11312 4L **Deep learning-based relative stopping power mapping generation with cone-beam CT in proton radiation therapy** [11312-166]
- 11312 4M **Stopping power map estimation from dual-energy CT using deep convolutional neural network** [11312-167]
- 11312 4N **A deep RNN for CT image reconstruction** [11312-168]
- 11312 4O **Evaluation of deep learning segmentation for rapid, patient-specific CT organ dose estimation using an LBTE solver** [11312-169]
- 11312 4P **Deep learning-based low dose CT imaging** [11312-170]
- 11312 4Q **Use of a convolutional neural network (CNN) to determine if the patient's eye lens is in the beam for x-ray image projections** [11312-171]

POSTER SESSION: PHOTON COUNTING IMAGING

- 11312 4R **A blooming correction technique for improved vasa vasorum detection using an ultra-high-resolution photon-counting detector CT** [11312-172]
- 11312 4S **Sparse view-CT based on photon counting detector using multi-level wavelet-CNN** [11312-173]
- 11312 4T **The effects of the spatio-energetic system response of cadmium telluride x-ray detectors on basis-material decomposition for iodine imaging tasks** [11312-174]
- 11312 4U **Leveraging deep generative model for direct energy-resolving CT imaging via existing energy-integrating CT images** [11312-175]
- 11312 4V **Development of 3-material decomposition method combining multiple 2-material decompositions in photon counting CT** [11312-176]
- 11312 4W **Three material decomposition for spectral imaging without contrast agents in photon-counting CT-modeling and feasibility study** [11312-177]
- 11312 4X **Optimization of basis material selection and energy binning in three material decomposition for spectral imaging without contrast agents in photon-counting CT** [11312-178]

11312 4Y **Development of a benchtop photon counting cone-beam CT system with a translate-rotate geometry** [11312-179]

POSTERS SESSION: PHASE CONTRAST IMAGING

11312 4Z **Investigation of artifacts due to large-area grating defects and correction using short window Fourier transform and convolution neural networks for phase-contrast x-ray interferometry** [11312-180]

11312 50 **Comparison of the phase and absorption contrast tomographic reconstruction** [11312-181]

11312 51 **A comparison of phase retrieval methods for propagation-based contrast x-ray imaging with polychromatic sources** [11312-182]

11312 52 **Objective characterization of an in-line phase sensitive imaging prototype using a mid-energy beam** [11312-183]

11312 53 **Development of simulations for a mesh-based x-ray phase imaging system** [11312-184]

11312 55 **Phantom measurements with a mesh-based phase system employing polycapillary optics** [11312-186]

POSTER SESSION: MAMMOGRAPHY

11312 56 **A prototype system of upright dedicated cone-beam breast CT** [11312-188]

11312 57 **Pre-processing for image quality improvement in simultaneous DBT and mechanical imaging** [11312-189]

11312 58 **Evaluation of digital breast tomosynthesis systems** [11312-190]

11312 59 **Virtual clinical trials in 3D and 2D breast imaging with digital phantoms derived from clinical breast CT scans** [11312-191]

11312 5A **Quantitative evaluation of virtual monochromatic imaging for detection of microcalcifications** [11312-192]

11312 5B **Spectral signatures from small angle x-ray scattering for breast cancer discrimination** [11312-193]

11312 5C **Tabletop high-resolution breast specimen imaging system based on field emission CNT x-ray source** [11312-194]

11312 5D **Preliminary data on TruviewMAG to assess the visibility of microcalcifications and image quality of mammograms: comparison with the standard magnification view** [11312-195]

- 11312 5E **Early results for equivalent wavefield transform as a direct solution to the inverse modeling problem for active infrared thermography and potential for perfusion information to differentiate healthy versus cancerous breast tissue** [11312-196]
- 11312 5F **Advancing synthetic mammography for stationary digital breast tomosynthesis** [11312-197]
- 11312 5G **Proposing rapid source pulsing for improved super-resolution in digital breast tomosynthesis** [11312-198]
- 11312 5H **3D redatuming for breast ultrasound** [11312-199]
- 11312 5I **Deep learning model observer for 4-alternative forced choice in digital breast tomosynthesis** [11312-200]
- 11312 5J **Effect of tissue density on the temperature pattern of the breast** [11312-201]

Authors

Numbers in the index correspond to the last two digits of the seven-digit citation identifier (CID) article numbering system used in Proceedings of SPIE. The first five digits reflect the volume number. Base 36 numbering is employed for the last two digits and indicates the order of articles within the volume. Numbers start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B...0Z, followed by 10-1Z, 20-2Z, etc.

Abadi, Ehsan, 14, 1T, 1U, 1Y, 2Z
Abbey, Craig K., 0L
Acciavatti, Raymond J., 0I, 5G
Adamson, Philip M., 4O
Aerden, Dimitri, 15
Ahn, Chulkyun, 2U
Ahn, Jung Sun, 2E, 5C
Ahn, Yujung, 3F
Akamatsu, Keiichi, 1I
Albarqouni, Shadi, 1Q
Allman, Ariana B., 35
Allmendinger, Thomas, 1R
Altunbas, Cem, 2W
Amin, Mitesh, 2G
Amunts, Katrin, 39
Anastasio, Mark A., 0V
Anderson, Jill, 4R
Anthony, Brian W., 2G
Antonuk, Larry E., 10
Arnab, Salman M., 0G
Aulwes, Ethan F., 3H
Ayer, Markus, 39
Baba, Hiroyasu, 0D
Badal, Andreu, 0M
Badea, C. T., 0A, 0F, 1I
Bader, A. M., 4Y
Bakic, Predrag R., 0I, 32, 57
Bambot, Shabbir, 0P
Barber, Rina Foygel, 1F
Barufaldi, Bruno, 0I, 5G
Bazalova-Carter, Magdalena, 3I
Beck, Stefanie, 1Q
Becker, Amy E., 0L
Bednarek, Daniel R., 0Y, 3A, 3B, 3C, 3D, 3E, 4Q
Beilfter, Jonathan J., 4M
Bennett, N. Robert, 1L, 1P, 20, 25, 2M
Beuing, Oliver, 2S
Bhadra, Sayantan, 0V
Bian, Zhaoying, 0B, 42, 43, 44, 4B, 4D, 4U
Billingsley, Alex J., 04, 24, 37
Bliznakova, Kristina, 59
Bollinger, Laura, 33
Boone, John M., 0L, 3I, 59
Boonen, Pieter Thomas, 15
Bosmans, Hilde, 0J, 0K, 2T
Boyd, Douglas, 3I
Brankov, Jovan G., 50
Brown, Conner, 12
Buls, Nico, 15, 30
Bushe, Dan, 22
Buzzatti, Luca, 30
Byrum, Russell, 33
Cahill, Patrick J., 2K
Cai, Jianmei, 3O
Cai, Meishan, 2F
Camlica, Ahmet, 0G
Cao, Qian, 3Q
Capostagno, S., 1M
Castro, Marcelo A., 33
Cattrysse, Erik, 3O
Chan, Heang-Ping, 0Q
Chang, Jung Min, 5D
Chen, Gaofeng, 44
Chen, Guang-Hong, 06, 1B, 1J, 1K, 22, 3G, 4H
Chen, Hong, 3I
Chen, Jianwei, 1E
Chen, Wenhao, 3R
Chen, Yang, 4C
Chen, Zhiqiang, 1A
Cheung, Pikting, 55
Cho, Seungryong, 2E
Choi, Jae Young, 4E
Choi, Jinho, 5C
Choi, Seungyeon, 5I
Choi, Sunghoon, 5I
Choi, Young-Wook, 5I
Christensen, Søren, 17
Clackdoyle, Rolf, 3P
Clark, D. P., 0A, 0F, 1I
Cobos, Santiago F., 28
Cockmartin, Lesley, 0J, 0K
Colbeth, Richard E., 20, 3Q, 3W
Collins, J., 3B, 4Q
Conant, Emily F., 0I
Cruz, Orquídea, 5J
Cruz-Bastida, Juan Pablo, 22
Curran, Walter J., 47, 48, 49, 4L, 4M, 4P
Daly, Megan, 3I
Dance, David R., 0R
Dangelmaier, Julia, 1Q
Danielsson, Mats, 0E
Das, Mini, 1C, 1G, 5B
De Brucker, Yannick, 15
De Man, Bruno, 1H
de Mey, Johan, 15, 30
Deng, Xiaolei, 07, 4I
De Paepe, Lode, 32
Desbat, Laurent, 3P

Dewaraja, Yuni K., 0U
 Dey, Joyoni, 4Z
 di Franco, Francesca, 59
 Divel, Sarah E., 17
 D'Moore, Desirée, 55
 Dong, Xue, 47, 48, 49, 4P
 Dow, Scott, 0X
 Doyle, Scott, 31
 Duan, Jiayu, 3O
 Duan, Xiaoyu, 0H, 0O
 Dustler, Magnus, 57, 58
 Edic, Peter M., 1H
 Ehtiati, T., 1M
 Elangovan, Premkumar, 0R
 El-Mohri, Youcef, 10
 Engel, Klaus Juergen, 1O, 34
 Espy, Michelle, 3H
 Eulig, Elias, 1L
 Fang, Chengyijue, 3S, 56
 Fang, Yuan, 0G
 Feigin-Almon, Micha, 2G
 Feng, Mang, 1J
 Fessler, Jeffrey A., 0Q, 0U
 Figl, Michael, 0K
 Fingerle, Alexander A., 1Q
 Fletcher, Joel G., 1R
 Flohr, Thomas, 1R
 Fokuhl, Julia, 1Q
 Fraley, David, 4O
 François, Christopher, 22
 Fredette, Nathaniel R., 1G
 Freeman, Matthew S., 3H
 Freestone, Steven, 3W
 Fricks, Rafael B., 2Q
 Friel, Harry, 33
 Frysch, Robert, 2S, 3J
 Fu, Lin, 1H
 Fu, Shuai, 3T
 Fu, Wanyi, 14, 1U
 Fujiwara, Hisao, 11
 Fung, George S. K., 02
 Gaalaas, Laurence, 2R
 Gang, Grace J., 0P, 18, 1Z, 27, 3Q
 Gao, Hwei, 08, 1A, 1P
 Gao, Mingjie, 0Q
 Gao, Qi, 0B, 42, 43, 44, 4B, 4D, 4U
 Gao, Yongfeng, 21, 4A
 Garrett, John W., 1K, 3G, 4H
 Ge, Yongshuai, 07, 1E, 41, 4C
 Gershenson, J., 5E
 Gershenson, M., 5E
 Ghamraoui, Bahaa, 0M, 4Y
 Ghani, M., 52
 Ghavidel, Beth, 4L, 4M
 Gifford, Howard C., 0T
 Gilat Schmidt, Taly, 1F, 4O
 Glick, Stephen J., 0M, 4Y
 Go, Eunsol, 3F
 Goldan, A., 0X
 Gomi, Tsutomu, 4F
 Gong, Hao, 09
 González, Francisco J., 5J
 González, Raymundo, 5J
 Graff, Christian G., 0M
 Gregory, Bradley, 52
 Griner, Dalton, 4H
 Guo, Chao, 3A, 3B, 3C, 3D, 3E
 Guo, Hongbo, 2H
 Guo, Jinchuan, 1E
 Guo, Zijia, 03
 Gupta, Amar Prasad, 2E, 2V, 5C
 Gupta, Ashish, 0W
 Ha, Su Min, 5D
 Haase, V., 1N
 Hahn, K., 1N
 Halaweish, Ahmed, 1R
 Hammoud, Dima, 33
 Han, R., 26
 Hao, You, 2K
 Hara, Hidetake, 4F
 Harmon, Ian E., 1C
 Harms, Joseph, 4L, 4M
 Harvey, Evan, 36
 Hassan, Laila, 53
 Haupt, Robert W., 2G
 He, Xiaowei, 2H
 Hellgren, Gustav, 58
 Heo, Changyong, 2U
 Herbst, M., 05
 Hernandez, Andrew M., 0L
 Hertz, Hans M., 1V
 Higgins, Kristin, 47, 48, 49
 Hizukuri, Akiyoshi, 46
 Hoeschen, Christoph, 2N
 Holbrook, M. D., 0F, 11
 Holdsworth, David W., 28
 Hong, Eunyeong, 4E
 Hong, Zixuan, 3T
 Hörndler, Klaus, 1L
 Hou, Yuqing, 2H
 Howansky, Adrian, 0X
 Hoye, Jocelyn, 2O
 Hu, Zhenhua, 2F
 Huang, Bangyan, 3K
 Huang, Chongfei, 3L
 Huang, Hailiang, 0H, 0O
 Huang, Haiyun, 43, 4D
 Huang, Jing, 0B, 42, 43, 4D, 4U
 Huck, Sascha Manuel, 02
 Hughes, Julie M., 2G
 Hummel, Johann, 0K
 Ichikawa, Yasutaka, 46
 Inglis, Stuart, 31
 Insoe, Christina R., 04, 24, 2R, 37, 5F
 Ionita, Ciprian N., 35
 Ishida, Masaki, 46
 Ishihara, Nozomi, 2Z
 Izawa, Takashi, 0D

Jacobs, R., 2T
 Jang, Hyunsuk, 0G
 Jang, Jaekyu, 2V, 5C
 Jeon, Hyojin, 3F
 Jeong, Changwon, 2E
 Jeong, Jin-Woo, 3F
 Ji, Xu, 1B, 1J
 Jiang, Xiao, 3K, 56
 Jiang, Xiaojun, 4P
 Jo, Mijung, 5D
 Job, Isaias, 3W
 Jones, Elizabeth, 1Y
 Jordan, Petr, 4O
 Jung, Jaeik, 2E, 2V, 5C
 Jung, Kahee, 5D
 Kabir, M. Z., 0G
 Kachelrieß, Marc, 1L
 Kang, Jun-Tae, 3F
 Kang, Songhee, 4E
 Kanwal, Bushra, 55
 Kapadia, Anuj, 1T
 Kappler, S., 05
 Karim, Karim S., 0G, 51
 Kato, Munetaka, 11
 Keelson, Benymeen, 30
 Kessener, Yves, 3Z
 Kim, Burnyoung, 2D, 45, 4I
 Kim, Dohyeon, 4S, 5A
 Kim, Dong Sik, 4E
 Kim, Dongkeun, 2E
 Kim, Eun Sil, 5D
 Kim, Hee-Joung, 4S, 5A, 5I
 Kim, Hyemi, 4S, 5A
 Kim, Jae-Woo, 3F
 Kim, Jong Hyo, 2U
 Kim, Namkug, 5C
 Kim, Seung Hoon, 5C
 Kim, Sihwan, 2U
 Kim, Soo-Yeon, 5D
 Kim, Sunghee, 3F
 Kim, Wooseob, 2V
 Kimpe, Tom, 32
 Kitagawa, Kakuya, 46
 Kleinszig, G., 26
 Knaup, Michael, 1L
 Ko, Beomseok, 5C
 Kojima, Shinichi, 4V
 Kopp, Felix K., 1Q
 Kreher, B., 26
 Krol, Andrzej, 0T
 Krumina, Gunta, 2J
 Kulvait, Vojtěch, 3J
 Kumagai, Oichi, 0D
 Kunze, H., 26
 Laeseke, Paul F., 16, 1W
 Lalonde, Robert, 4T
 Lansberg, Maarten G., 17
 Larsson, Jakob C., 1V
 Lauritsch, Günter, 03
 Laux, Joseph, 33
 LeClair, R. J., 3Y
 Lee, Denny, 0G
 Lee, Do Il, 2U
 Lee, Eunae, 4E
 Lee, Jeong-Woong, 3F
 Lee, Ji Hyun, 33
 Lee, Minjae, 4S, 5A
 Lee, Seungwan, 2D, 45, 4I
 Lee, Su Hyun, 5D
 Lee, Youngjin, 2D
 Lee, Yueh Z., 04, 24, 37, 38, 5F
 Lei, Yang, 47, 48, 49, 4L, 4M, 4P
 Leiner, Tim, 15
 Leng, Shuai, 4R
 Leong, Andrew F. T., 0P
 Léveillé, Sébastien, 0X
 Lewis, Steven, 31
 Li, Danyang, 0B, 42, 43, 44, 4B, 4D, 4U
 Li, Hua, 2K
 Li, Jing, 3N
 Li, Ke, 0Z, 1B, 1J, 1K, 22, 36, 3G, 4H
 Li, Sui, 0B, 42, 43, 44, 4B, 4D, 4U
 Li, Taotao, 3R
 Li, Xinbin, 1A
 Li, Y., 52
 Li, Yang, 2B, 3L, 3O
 Li, Yi, 3N
 Li, Yinsheng, 06, 1K, 22, 3G, 4H
 Lian, Maosen, 3N
 Liang, Albert K., 10
 Liang, Dong, 07, 1E, 41, 4C
 Liang, Kaichao, 3M
 Liang, Zhengrong, 21, 4A
 Liapi, Eleni, 18
 Liduma, Sanita, 2J
 Lim, Hongki, 0U
 Lin, Liyong, 4M
 Lippert, Thomas, 39
 Liu, H., 52
 Liu, Peizhen, 1E
 Liu, Ruirui, 1S
 Liu, Tian, 47, 48, 49, 4L, 4M, 4P
 Liu, Yanqiu, 2H
 Liu, Yingzi, 4M, 4P
 Lloyd, Christopher W., 2G
 Lo, Joseph Y., 0J, 1T, 2Y
 Lo, S.-F., 26
 Lohr, Rhiannon L., 51
 Long, Wenting, 4W, 4X
 Lu, Jianping, 04, 24, 2R, 37, 38, 5F
 Lu, Minghui, 20, 25, 3Q
 Lu, Siming, 4A
 Lubinsky, A. R., 0X
 Lubner, Meghan, 22
 Luckner, C., 05
 Luguzis, Artis, 2J
 Luo, Shouhua, 3N
 Luo, Yueting, 37, 38

Lyu, Qihui, 4J
 Lyu, Su Hyun, 0L
 Ma, Jianhua, 0B, 3T, 42, 43, 44, 4B, 4D, 4U
 Ma, Yiqun, 3Q
 MacDonald, Carolyn A., 53, 55
 Maes, Willy H., 3Z
 Magnelind, Per E., 3H
 Maidment, Andrew D. A., 0I, 1Q, 32, 57, 5G
 Maier, Andreas, 03, 1N
 Maier, Joscha, 1L
 Makeev, Andrey, 0M, 4Y
 Mao, Hui, 47, 48, 49
 Marsh, Jeffrey, Jr., 4R
 Marshall, Matthew S. J., 12
 Marshall, N. W., 0J
 Mativenga, Mallory, 2E
 Matsumoto, Isao, 2Z
 Mazurowski, Maciej, 1T
 McCarthy, E. L., 3Y
 McCollough, Cynthia H., 09, 1R, 4R
 McDonald, Mark, 4L
 McDonough, Joseph M., 2K
 Medrano, Maria, 1S
 Meng, Deyu, 0B, 44
 Meng, Mingqiang, 0B, 42, 44
 Menser, Bernd, 1O, 34
 Merken, K., 2T
 Merrill, Frank E., 3H
 Mettievier, Giovanni, 59
 Miller, James J., 3Z
 Miller, Jessica R., 1J
 Miller, Stuart R., 12
 Mishchenko, Anastasiia, 0X
 Mizukami, Shinya, 4F
 Mohan, Chandra, 1G
 Montoya, Juan, 3G
 Mou, Xuanqin, 21, 2B, 3L, 3O
 Na, Yong Ju, 5D
 Nagarkar, Vivek V., 12
 Nagata, Motonori, 46
 Nagi, Chandandeep, 5B
 Nakamura, Tadashi, 2C
 Nakayama, Ryohei, 46
 Navab, Nassir, 1Q
 Ng, Susan, 57
 Nguyen, Hung, 3P
 Ni, Yifan, 1E
 Nikolau, Ethan P., 1W
 Nikolov, Hristo N., 28
 Nishihara, Toshiyuki, 0D
 Nissman, Daniel, 04
 Niu, Tianye, 4J
 Noël, Peter B., 0I, 18, 1Q, 5G
 Noo, Frédéric, 03, 1N
 Nye, Jonathon A., 47, 48, 49
 Oberstar, Erick L., 16
 Offe, Michael, 4O
 Okada, Yoshihiro, 11
 Omoumi, F., 52
 Ong, Chloe Leigh, 0H
 O'Sullivan, Joseph A., 1S
 Pahn, Gregor, 1Q
 Park, Junyoung, 2E
 Park, Sora, 3F
 Park, Yeonok, 2W
 Parodi, Katia, 02
 Partain, Larry, 3I
 Passand, Zahra, 2N
 Pegues, Hope, 2Y
 Pelc, Norbert J., 17, 1P
 Periyasamy, Sarvesh, 16, 1W
 Perrone, Lisa, 2R
 Persson, Mats U., 0E, 1H
 Peters, Inge M., 3Z
 Petrov, Dimitar, 0K
 Petruccelli, Jonathan C., 53, 55
 Pfeiffer, Daniela, 1Q
 Pham, Thahn Tra, 58
 Philips, Wilfried, 32
 Pil-Ali, Abdollah, 51
 Platisa, Ljiljana, 32
 Plies, Michael, 3I
 Podgorsak, A., 4Q
 Politis, C., 2T
 Polifte, David G., 1S
 Pollmann, Steven I., 28
 Porras-Chaverri, Mariela, 1S
 Portero Lopez, Violeta, 30
 Principi, Sara, 4O
 Puett, Connor, 04, 24, 2R, 5F
 Punzet, Daniel, 2S, 3J
 Pyakurel, Uttam, 55
 Rajagopal, Jayasai, 1Y
 Rajendran, Kishore, 1R, 4R
 Rava, Ryan A., 35
 Regan Anderson, Michael, 2R
 Ren, Liqiang, 09, 1R
 Ren, Yan, 4W, 4X
 Renforth, Kate L., 0R
 Renger, Bernhard, 1Q
 Ria, Francesco, 14
 Richards, Taylor, 2O
 Richardson, Jonathan M., 2G
 Ríos, Julián, 5J
 Ritman, Erik, 4R
 Ritschl, L., 05
 Rodriguez Luna, J. C., 5B
 Rohr, Pierre, 1O
 Rojas, Oscar, 33
 Rose, Georg, 2S, 3J
 Ruan, Dan, 4J
 Rudin, Stephen, 0Y, 35, 3A, 3B, 3C, 3D, 3E, 4Q
 Ruetten, Walter, 1O, 34
 Rummeny, Ernst J., 1Q
 Russo, Paolo, 59
 Ryu, Jehwang, 2E, 2V, 5C
 Saad, Fatima, 3J

Sadri, Amir Reza, 0W
 Sakuma, Hajime, 46
 Salomon, Elisabeth, 0K
 Samala, Ravi K., 0Q
 Samei, Ehsan, 14, 1T, 1U, 1Y, 2O, 2Q, 2Y, 2Z
 Sarno, Antonio, 59
 Sauer, Thomas, 1U, 1Y
 Sauter, Andreas P., 1Q
 Schaefer, Dirk, 34
 Scheerlink, Thierry, 30
 Scheuermann, James, 0X
 Schmidt, Bernhard, 1R
 Schmidlein, C. Ross, 0T
 Schmitz, Daniel, 39
 Schöndube, H., 1N
 Schultheiß, Manuel, 1Q
 Scott, Chris C., 51
 Segars, William Paul, 1T, 1Y, 2Z
 Semturs, Friedrich, 0K
 Seo, Wontaek, 5D
 Setiawan, Hananiel, 14
 Setlur Nagesh, S. V., 0Y
 Shaheen, E., 2T
 Shaker, Kian, 1V
 Shapira, Nadav, 1Q
 Shapiro, Edward, 20
 Shen, Liuxing, 10
 Sheng, Ke, 4J
 Sheth, Niral, 12, 26
 Shi, Gengxin, 12
 Shi, Linxi, 20, 25, 2M
 Shi, Yongyi, 21, 4A
 Shin, Choul Woo, 5D
 Shinohara, Norimitsu, 0D
 Shu, Hui-Kuo, 4P
 Sidebottom, Rachel B., 3H
 Sidky, Emil Y., 1F
 Siewerdsen, Jeffrey H., 05, 12, 1M, 26, 27
 Simon, Matthias, 1O, 34
 Singh, Bipin, 12
 Sisniega, Alejandro, 0P, 1M, 26
 Smith, Bryce, 4Z
 Smith, Taylor Brunton, 14, 1U
 Soh, Jeongtae, 2E
 Solomon, Jeffrey, 33
 Solomon, Justin B., 1U, 2O, 2Q
 Soloviev, Vadim Y., 0R
 Song, Samuel, 3I
 Song, Yoon-Ho, 3F
 Speck, Oliver, 2S
 Speidel, Michael A., 16, 1W
 Spronk, Derrek, 37, 38
 Stalbaum, Tyler, 3I
 Star-Lack, Josh, 20, 25, 3Q
 Stavro, Jann, 0X
 Stayman, J. Webster, 0P, 18, 1M, 1Z, 27, 3Q
 Stierstorfer, Karl, 02, 1N
 Stokes, William, 4L
 Strother, Charles, 1K, 3G
 Su, Ting, 07, 41, 4C
 Sun, Sheng-Hsuan, 3A, 3E
 Sun, Weiyuan, 53
 Sun, Xindong, 07, 41
 Sundberg, Christel, 0E
 Taguchi, Katsuyuki, 0C
 Tai, Ya-Hsiang, 3X
 Tajima, Takashi, 11
 Takahashi, Isao, 4V
 Takahashi, Keiko, 2C
 Tamura, Masaya, 2Z
 Tan, Jiaying, 4A
 Tanaka, Rie, 2Z
 Tang, Xiangyang, 4P, 4W, 4X
 Tanguay, Jesse, 4T
 Tanimoto, Tatsunori, 11
 Tao, Shengzhen, 4R
 Tao, Xi, 3T
 Taskin, Ulas, 5H
 Theodore, N., 26
 Thomasson, David, 33
 Thran, Axel, 1O, 34
 Tian, Jie, 2F
 Tian, Yi, 2X, 3R
 Tian, Zhen, 4P
 Tingberg, Anders, 57, 58
 Tivnan, Matthew, 18, 1Z, 3Q
 Tiwari, Pallavi, 0W
 Tognina, Carlo, 3W
 Tong, Huayu, 2Y
 Tong, Yubing, 2K
 Torigian, Drew A., 2K
 Torres, Luis A., 1W
 Toumi, Mehdi, 5O
 Tousignant, Olivier, 3Z
 Troville, Jonathan, 3B, 3C, 3D, 3E, 4Q
 Tupa, Dale, 3H
 Udupa, Jayaram K., 2K
 Uneri, A., 26
 Unger, Ewald, 0K
 Ushikura, Shinichi, 11
 Vagdargi, P., 26
 Vancoillie, Liesbeth, 0J, 0K
 Vandemeulebroucke, Jef, 15, 30
 van Dongen, Koen W. A., 5H
 Van Gompel, Gert, 15, 30
 Vasudev, Varun, 32
 Vazquez, Ivan, 1C
 Vent, Trevor L., 0I, 5G
 Vercnocke, Andrew, 4R
 Vijayan, R., 26
 Viswanath, Satish E., 0W
 Vogt, S., 05, 26
 Vullers, Ruud J. M., 3Z
 Wagner, Martin G., 1W
 Wainman, Bruce, 3I
 Wang, Adam S., 1L, 1P, 20, 25, 2M, 4O
 Wang, Lei, 42, 44
 Wang, Tianshu, 3N

Wang, Tonghe, 47, 48, 49, 4L, 4M, 4P
 Wang, Wenying, 0P, 18, 1Z, 3Q
 Wang, Yang, 2X
 Wang, Yongbo, 3T
 Watanabe, Yusuke, 4F
 Webb, Tyler, 1S
 Weil, Michael, 3I
 Weisfield, Richard, 3W
 Weiss, C. R., 1M
 Wells, Kevin, 0R
 Wells, Stephen, 0R
 Wen, Xiang, 3R
 Whitehead, Joseph F., 1W
 Whiting, Bruce, 1S
 Wikner, J. Jacob, 0E
 Wiley, Benjamin J., 2Y
 Wileyto, E. Paul, 5G
 Williamson, Jeffrey, 1S
 Wong, M., 52
 Wu, Caiyun, 2K
 Wu, Chengpeng, 1A
 Wu, Chengyang, 40
 Wu, Jesse, 0P
 Wu, P., 26
 Wu, X., 52
 Wu, Yijing, 3G
 Xie, Huiqiao, 4W, 4X
 Xie, Qi, 0B, 44
 Xing, Yuxiang, 08, 3M
 Xu, Gongming, 3S, 56
 Xu, Jingzhu, 4Z
 Xu, Yan, 40
 Xu, Yuesheng, 0T
 Yamakawa, Keisuke, 2C
 Yamashiro, Tsuneo, 2Z
 Yang, Xiaofeng, 47, 48, 49, 4L, 4M, 4P, 4X
 Yang, Yirong, 3M
 Yao, Jingwu, 40
 Yao, Lisha, 0B, 4B, 4U
 Yeh, Shan, 3X
 Yeo, Seung Jun, 5C
 Yeon, Ji-Hwan, 3F
 Yi, Ann, 5D
 Yim, Dobin, 2D, 45, 4I
 Yokoi, Kazuma, 4V
 Yoo, Namjo, 4E
 Yoon, Kwon-Ha, 2E
 Young, Kenneth C., 0R
 Yu, Lifeng, 09, 1R
 Yu, Zhelin, 2W
 Yu, Zhou, 23
 Yun, Ki Nam, 3F
 Zackrisson, Sophia, 57
 Zbijewski, Wojciech, 05, 12, 1M, 3Q
 Zeng, Dong, 0B, 42, 43, 44, 4B, 4D, 4U
 Zhang, Chengzhu, 06
 Zhang, G., 2T
 Zhang, Guoqing, 2X, 3R
 Zhang, Hua, 3T
 Zhang, Jun, 4N
 Zhang, Li, 08, 1A
 Zhang, Pu, 40
 Zhang, Ran, 1B, 1J
 Zhang, Ruoqiao, 23
 Zhang, Shanli, 43, 4D, 4U
 Zhang, Xiaoyun, 55
 Zhang, Xinyu, 42, 4B
 Zhang, Yikun, 4C
 Zhao, C., 05
 Zhao, Hengna, 2H
 Zhao, Qian, 0B, 44
 Zhao, Qihua, 10
 Zhao, Tianyu, 1S
 Zhao, Wei, 0H, 0O, 0X
 Zheng, Ao, 08
 Zheng, B., 52
 Zheng, Hairong, 07, 41, 4C
 Zhi, Shaohua, 2B, 3L, 3O
 Zhong, Rikui, 4B
 Zhou, Hao, 1P
 Zhou, Jian, 23
 Zhou, Jun, 4L, 4M
 Zhou, Otto Z., 04, 24, 2R, 37, 38, 5F
 Zhou, Wei, 50
 Zhou, Weimin, 0V
 Zhu, Jiongtao, 41, 4C
 Zhu, Lei, 1P, 3K, 3S, 56
 Zhu, Manman, 0B, 42, 43, 44, 4B, 4D, 4U
 Zhu, Xiaohua, 1A
 Ziskin, Vitaliy, 3I
 Zuo, Hongquan, 4N

Conference Committee

Symposium Chairs

Georgia D. Tourassi, Oak Ridge National Laboratory (United States)
Metin N. Gurcan, M.D., Wake Forest Baptist Medical Center
(United States)

Conference Chairs

Guang-Hong Chen, University of Wisconsin School of Medicine and
Public Health (United States)
Hilde Bosmans, UZ Leuven (Belgium)

Conference Co-chair

Wei Zhao, Stony Brook Medicine (United States)

Conference Program Committee

Shiva Abbaszadeh, University of Illinois at Urbana-Champaign
(United States)
Adam M. Alessio, Michigan State University (United States)
Mini Das, University of Houston (United States)
Mats E. Danielsson, KTH Royal Institute of Technology (Sweden)
Maria Drangova, Robarts Research Institute (Canada)
Rebecca Fahrig, Siemens Healthineers (Germany)
Thomas G. Flohr, Siemens Healthineers (Germany)
Arundhuti Ganguly, Varex Imaging Corporation (United States)
Yongshuai Ge, Shenzhen Institutes of Advanced Technology (China)
Taly Gilat Schmidt, Marquette University (United States)
Stephen J. Glick, U.S. Food and Drug Administration (United States)
and University of Massachusetts Medical School (United States)
Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany)
Karim S. Karim, University of Waterloo (Canada)
Hee-Joung Kim, Yonsei University (Korea, Republic of)
Patrick J. La Rivière, The University of Chicago (United States)
Quanzheng Li, Massachusetts General Hospital (United States)
Joseph Yuan-Chieh Lo, Carl E. Ravin Advanced Imaging
Laboratories, Duke University (United States)
Peter B. Noël, University of Pennsylvania (United States)
Frédéric Noo, The University of Utah (United States)
Jinyi Qi, University of California, Davis (United States)
John M. Sabol, GE Healthcare (United States)

Ioannis Sechopoulos, Radboud University Medical Center
(Netherlands)
Joseph W. Stayman, Johns Hopkins University (United States)
Anders Tingberg, Lund University (Sweden)
Adam S. Wang, Stanford University School of Medicine (United States)
Yuxiang Xing, Tsinghua University (China)
John I. Yorkston, Carestream Health, Inc. (United States)
Lifeng Yu, Mayo Clinic (United States)
Behrouz Shabestari, National Institute of Biomedical Imaging and
Bioengineering (United States)

Session Chairs

- 1 New Technologies in Imaging
Wei Zhao, Stony Brook Medicine (United States)
Guang-Hong Chen, University of Wisconsin School of Medicine and
Public Health (United States)
- 2 CT Reconstruction with DL Techniques
Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany)
Jinyi Qi, University of California, Davis (United States)
- 3 Photon Counting Detectors
Mats E. Danielsson, KTH Royal Institute of Technology (Sweden)
Stephen J. Glick, U.S. Food and Drug Administration (United States)
and University of Massachusetts Medical School (United States)
- 4 Quality Assessment and Optimization in Breast Imaging
Hilde Bosmans, UZ Leuven (Belgium)
Joseph Yuan-Chieh Lo, Carl E. Ravin Advanced Imaging
Laboratories, Duke University (United States)
- 5 Breast Imaging: New Technology
Patrick J. La Rivière, The University of Chicago (United States)
Hee-Joung Kim, Yonsei University (Korea, Republic of)
- 6 Innovations in Nuclear Medicine and MRI
Guang-Hong Chen, University of Wisconsin School of Medicine and
Public Health (United States)
Quanzheng Li, Massachusetts General Hospital (United States)
- 7 Detector Technologies
Rebecca Fahrig, Siemens Healthineers (Germany)
Karim S. Karim, University of Waterloo (Canada)

- 8 Target: Contrast Agent Imaging Optimized
John I. Yorkston, Carestream Health, Inc. (United States)
Maria Drangova, Robarts Research Institute (Canada)
- 9 X-ray Phase Contrast Imaging
Peter B. Noël, University of Pennsylvania (United States)
Mini Das, University of Houston (United States)
- 10 Photon Counting CT Applications
Lifeng Yu, Mayo Clinic (United States)
Arundhuti Ganguly, Varex Imaging Corporation (United States)
- 11 CBCT Reconstruction Techniques
Adam M. Alessio, Michigan State University (United States)
Adam S. Wang, Stanford University School of Medicine (United States)
- 12 Spectral CT New Hardware
John M. Sabol, GE Healthcare (United States)
Taly Gilat Schmidt, Marquette University (United States)
- 13 Virtual Imaging
Ioannis Sechopoulos, Radboud University Medical Center
(Netherlands)
Joseph Yuan-Chieh Lo, Carl E. Ravin Advanced Imaging
Laboratories, Duke University (United States)
- 14 New Reconstruction Techniques in Dual Energy CT
Frédéric Noo, The University of Utah (United States)
- 15 Artifacts in CBCT Solved
Joseph W. Stayman, Johns Hopkins University (United States)
Lifeng Yu, Mayo Clinic (United States)

2020 Medical Imaging Award Recipients

Robert F. Wagner Best Student Paper Award

Robert F. Wagner was an active scientist in the SPIE Medical Imaging meeting, starting with the first meeting in 1972 and continuing throughout his career. He ensured that the BRH, and subsequently the CDRH, was a sponsor for the early and subsequent Medical Imaging meetings, helping to launch and ensure the historical success of the meeting. The Robert F. Wagner All-Conference Best Student Paper Award (established 2014) is acknowledgment of his many important contributions to the Medical Imaging meeting and his many important advances to the field of medical imaging.



This award is co-sponsored by:



The Medical Image Perception Society

SPIE.

2020 Recipients:

First Place: **Multi-body registration for fracture reduction in orthopaedic trauma surgery (11315-14)**

R. Han, A. Uneri, P. Wu, R. Vijayan, P. Vagdargi, M. Ketcha, N. Sheth, Johns Hopkins University (United States), S. Vogt, G. Kleinszig, Siemens Healthineers (Germany) G. M. Osgood, John Hopkins Hospital (United States), J. H. Siewerdsen, John Hopkins University (United States)

Second Place: **Phase contrast CT enabled three-material decomposition in spectral CT imaging (11312-47)**

Xu Ji, Ran Zhang, Ke Li, Guang-Hong Chen, University of Wisconsin School of Medicine and Public Health (United States)

Physics of Medical Imaging Student Paper Awards sponsored by GE Healthcare

Winner: **Phase contrast CT enabled three-material decomposition in spectral CT imaging (11312-47)**

Xu Ji, Ran Zhang, Ke Li, Guang-Hong Chen, University of Wisconsin School of Medicine and Public Health (United States)

Runner-up: **Method for metal artifact avoidance in C-Arm cone-beam CT (11312-78)**

P. Wu, N. Sheth, A. Sisniega, A. Uneri, R. Han, R. Vijayan, P. Vagdargi, Johns Hopkins University (United States), B. Kreher, H. Kunze, G. Kleinszig, S. Vogt, Siemens Healthineers (Germany), S.-F. Lo, N. Theodore, and J. H. Siewerdsen, John Hopkins University (United States)

Runner-up: 1 μm spatial resolution in silicon photon-counting CT detectors by measuring charge diffusion (11312-14)

Christel Sundberg, Mats Persson, KTH Royal Institute of Technology (Sweden), J. Jacob Wikner, Linköping University, (Sweden) Mats Danielsson, KTH Royal Institute of Technology (Sweden)