

Medical Imaging 2014

Physics of Medical Imaging

Bruce R. Whiting
Christoph Hoeschen
Despina Kontos
Editors

17–20 February 2014
San Diego, California, United States

Sponsored by
SPIE

Cosponsored by
Modus Medical Devices Inc. (Canada) • XIFIN, Inc. • Ventana Medical Systems Inc. • Intrace Medical (Switzerland) • Caresteam • GE Healthcare

Cooperating Organizations
AAPM—American Association of Physicists in Medicine (United States) • APS—American Physiological Society • CARS—Computer Assisted Radiology and Surgery (Germany) • The DICOM Standards Committee • Medical Image Perception Society (United States) • Radiological Society of North America (United States) • Society for Imaging Informatics in Medicine (United States) • World Molecular Imaging Society

Published by
SPIE

Volume 9033
Part One of Three Parts

Proceedings of SPIE, 1605-7422, V. 9033

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

Medical Imaging 2014: Physics of Medical Imaging, edited by Bruce R. Whiting, Christoph Hoeschen, Despina Kontos,
Proc. of SPIE Vol. 9033, 903301 • © 2014 SPIE • CCC code: 1605-7422/14/\$18 • doi: 10.1117/12.2053734

The papers included 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. The papers published in these proceedings 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 this book:

Author(s), "Title of Paper," in *Medical Imaging 2014: Physics of Medical Imaging*, edited by Bruce R. Whiting, Christoph Hoeschen, Despina Kontos, Proceedings of SPIE Vol. 9033 (SPIE, Bellingham, WA, 2014) Article CID Number.

ISSN: 1605-7422

ISBN: 9780819498267

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 © 2014, 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 \$18.00 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 1605-7422/14/\$18.00.

Printed in the United States of America.

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



SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first 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, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four 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. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID Number.

Contents

Part One

- xxvii *Conference Committee*
- xxxi *2014 Medical Imaging Paper Award Recipients*

SESSION 1 KEYNOTE AND CARDIAC CT

- 9033 03 **Simulation evaluation of quantitative myocardial perfusion assessment from cardiac CT** [9033-2]
M. Bindschadler, Univ. of Washington (United States); D. Modgil, The Univ. of Chicago (United States); K. R. Branch, Univ. of Washington (United States); P. J. La Riviere, The Univ. of Chicago (United States); A. M. Alessio, Univ. of Washington (United States)
- 9033 04 **A combined local and global motion estimation and compensation method for cardiac CT** [9033-3]
Q. Tang, B. Chiang, Toshiba Medical Research Institute (United States); A. Akinyemi, Toshiba Medical Visualization Systems Europe, Ltd. (United Kingdom); A. Zamyatin, Toshiba Medical Research Institute (United States); B. Shi, Ohio Univ. (United States); S. Nakanishi, Toshiba Medical Research Institute (United States)

SESSION 2 CT AND APPLICATIONS

- 9033 05 **Dose reduction assessment in dynamic CT myocardial perfusion imaging in a porcine balloon-induced-ischemia model** [9033-4]
R. Fahmi, B. L. Eck, Case Western Reserve Univ. (United States); M. Vembar, Philips Healthcare (United States); H. G. Bezerra, Univ. Hospitals Case Medical Ctr. (United States); D. L. Wilson, Case Western Reserve Univ. (United States)
- 9033 06 **Estimating lesion volume in low-dose chest CT: How low can we go?** [9033-5]
S. Young, M. F. McNitt-Gray, UCLA Radiological Sciences (United States)
- 9033 07 **A biological phantom for evaluation of CT image reconstruction algorithms** [9033-6]
J. Cammin, G. S. K. Fung, E. K. Fishman, Johns Hopkins Univ. School of Medicine (United States); J. H. Siewerdsen, J. W. Stayman, Johns Hopkins Univ. (United States); K. Taguchi, Johns Hopkins Univ. School of Medicine (United States)
- 9033 08 **Impact of norm selections on the performance of four-dimensional cone-beam computed tomography (4DCBCT) using PICCS** [9033-7]
Y. Li, J. Tang, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 09 **3D image-based scatter estimation and correction for multi-detector CT imaging** [9033-8]
M. Petersilka, T. Allmendinger, K. Stierstorfer, Siemens AG (Germany)

- 9033 0A **In-line x-ray phase-contrast lung imaging in situ with a benchtop system** [9033-9]
A. B. Garson, Washington Univ. in St. Louis (United States); E. W. Izaguirre, Scott and White Healthcare (United States); S. G. Price, Washington Univ. School of Medicine, St. Louis (United States); H. Guan, S. K. Vasireddi, M. A. Anastasio, Washington Univ. in St. Louis (United States)

SESSION 3 PHASE CONTRAST IMAGING

- 9033 0B **Fast data acquisition method in x-ray differential phase contrast imaging using a new grating design** [9033-10]
Y. Ge, K. Li, J. Garrett, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 0C **Slit-scanning differential phase-contrast mammography: first experimental results** [9033-11]
E. Roesl, H. Daerr, T. Koehler, G. Martens, U. van Stevendaal, Philips Healthcare (Germany)
- 9033 0D **A multi-channel image reconstruction method for grating-based x-ray phase-contrast computed tomography** [9033-12]
Q. Xu, A. Sawatzky, M. A. Anastasio, Washington Univ. in St. Louis (United States)
- 9033 0E **Simultaneous implementation of low dose and high sensitivity capabilities in differential phase contrast and dark-field imaging with laboratory x-ray sources** [9033-13]
A. Olivo, C. K. Hagen, T. P. Millard, F. Vittoria, P. C. Diemoz, M. Endrizzi, Univ. College London (United Kingdom)
- 9033 0F **Cramér-Rao lower bound in differential phase contrast imaging and its application in the optimization of data acquisition systems** [9033-14]
Y. Ge, K. Li, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 0G **Statistical signal estimation methods in x-ray differential phase contrast imaging** [9033-15]
Y. Ge, K. Li, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 0H **Depth resolution properties of in-line x-ray phase-contrast tomosynthesis** [9033-16]
H. Guan, Q. Xu, A. Garson, M. A. Anastasio, Washington Univ. in St. Louis (United States)

SESSION 4 ALGORITHMS

- 9033 0J **Removing blooming artifacts with binarized deconvolution in cardiac CT** [9033-17]
C. Hofmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); M. Knaup, M. Kachelrieß, Deutsches Krebsforschungszentrum (Germany)
- 9033 0K **Automatic cable artifact removal for cardiac C-arm CT imaging** [9033-18]
C. Haase, Philips Healthcare (Germany) and Karlsruher Institut für Technologie (Germany); D. Schäfer, Philips Healthcare (Germany); M. Kim, S. J. Chen, J. Carroll, Univ. of Colorado Denver (United States); P. Eshuis, Philips Healthcare (Netherlands); O. Dössel, Karlsruher Institut für Technologie (Germany); M. Grass, Philips Healthcare (Germany)

- 9033 OL **Ring artifact reduction for metallic objects in direct digital radiography detectors with stationary antiscatter grids** [9033-19]
D. S. Kim, Hankuk Univ. of Foreign Studies (Korea, Republic of); S. Lee, DRTECH Corp. (Korea, Republic of)
- 9033 OM **Algorithms for optimizing CT fluence control** [9033-20]
S. S. Hsieh, N. J. Pelc, Stanford Univ. (United States)
- 9033 ON **Towards *in-vivo* K-edge imaging using a new semi-analytical calibration method** [9033-21]
C. Schirra, Philips Research (United States); A. Thran, H. Daerr, E. Roessl, R. Proksa, Philips Research (Germany)

SESSION 5 CT RECONSTRUCTIONS

- 9033 OO **Regularization design and control of change admission in prior-image-based reconstruction** [9033-22]
H. Dang, J. H. Siewerdsen, J. W. Stayman, Johns Hopkins Univ. (United States)
- 9033 OP **Novel iterative reconstruction method for optimal dose usage in redundant CT-acquisitions** [9033-23]
H. Bruder, R. Raupach, T. Allmendinger, S. Kappler, J. Sunnegardh, K. Stierstorfer, T. Flohr, Siemens HealthCare (Germany)
- 9033 OQ **FINESSE: a Fast Iterative Non-linear Exact Sub-space SEarch based algorithm for CT imaging** [9033-24]
K. Schmitt, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany), Siemens AG (Germany), and The Univ. of Utah (United States); H. Schöndube, K. Stierstorfer, Siemens AG (Germany); J. Hornegger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); F. Noo, The Univ. of Utah (United States)
- 9033 OR **A new approach to regularized iterative CT image reconstruction** [9033-25]
C. Hofmann, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); M. Knaup, M. Kachelrieß, Deutsches Krebsforschungszentrum (Germany)
- 9033 OS **A practical statistical polychromatic image reconstruction for computed tomography using spectrum binning** [9033-26]
M. Wu, Stanford Univ. (United States); Q. Yang, A. Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); R. Fahrig, Stanford Univ. (United States)
- 9033 OT **Investigation of an efficient short-scan C-arm reconstruction method with radon-based redundancy handling** [9033-27]
F. Dennerlein, H. Kunze, Siemens AG (Germany)

SESSION 6 RECONSTRUCTION

- 9033 OU **Statistical image reconstruction via denoised ordered-subset statistically penalized algebraic reconstruction technique (DOS-SPART)** [9033-28]
Y. Li, K. Niu, J. Tang, G. Chen, Univ. of Wisconsin-Madison (United States)

- 9033 0V **Toward a dose reduction strategy using model-based reconstruction with limited-angle tomosynthesis** [9033-29]
E. Haneda, J. E. Tkaczyk, GE Global Research Ctr. (United States); G. Palma, R. Iordache, GE Healthcare (France); S. Zelakiewicz, GE Global Research Ctr. (United States); S. Muller, GE Healthcare France (France); B. De Man, GE Global Research Ctr. (United States)
- 9033 0W **Enhancing tissue structures with iterative image reconstruction for digital breast tomosynthesis** [9033-30]
E. Y. Sidky, I. S. Reiser, The Univ. of Chicago (United States); R. M. Nishikawa, Univ. of Pittsburgh (United States); X. Pan, The Univ. of Chicago (United States)
- 9033 0X **Estimation of sparse null space functions for compressed sensing in SPECT** [9033-31]
J. M. Mukherjee, Univ. of Massachusetts Medical School (United States); E. Sidky, The Univ. of Chicago (United States); M. A. King, Univ. of Massachusetts Medical School (United States)
- 9033 0Y **Whole-body PET parametric imaging employing direct 4D nested reconstruction and a generalized non-linear Patlak model** [9033-32]
N. A. Karakatsanis, A. Rahmim, Johns Hopkins Univ. (United States)

SESSION 7 CONE BEAM CT AND NOVEL DESIGN

- 9033 0Z **Rapid scatter estimation for CBCT using the Boltzmann transport equation** [9033-33]
M. Sun, Varian Medical Systems, Inc. (United States); A. Maslowski, I. Davis, T. Wareing, G. Failla, Transpire, Inc. (United States); J. Star-Lack, Varian Medical Systems, Inc. (United States)
- 9033 10 **A patient-specific scatter artifacts correction method** [9033-34]
W. Zhao, S. Brunner, K. Niu, Univ. of Wisconsin-Madison (United States); S. Schafer, K. Royalty, Siemens Medical Solutions USA, Inc. (United States); G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 11 **Development and evaluation of a novel designed breast CT system** [9033-35]
C. Braun, H. Schlattl, O. Tischenko, Helmholtz Zentrum München GmbH (Germany); O. Dietrich, Ludwig-Maximilians-Univ. Hospital München (Germany); C. Hoeschen, Helmholtz Zentrum München GmbH (Germany)
- 9033 12 **Effective one step-iterative fiducial marker-based compensation for involuntary motion in weight-bearing C-arm cone-beam CT scanning of knees** [9033-36]
J.-H. Choi, Stanford Univ. School of Medicine (United States) and Stanford Univ. (United States); A. Maier, M. Berger, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); R. Fahrig, Stanford Univ. School of Medicine (United States)

SESSION 8 TOMOSYNTHESIS

- 9033 13 **Evaluation of low contrast detectability after scatter correction in digital breast tomosynthesis** [9033-37]
K. Michielsen, Katholieke Univ. Leuven (Belgium); A. Fieselmann, Siemens Healthcare (Germany); L. Cockmartin, J. Nuyts, Katholieke Univ. Leuven (Belgium)
- 9033 15 **Optimizing the acquisition geometry for digital breast tomosynthesis using the Defrise phantom** [9033-39]
R. J. Acciavatti, A. Chang, L. Woodbridge, A. D. A. Maidment, Univ. of Pennsylvania (United States)
- 9033 16 **Increased microcalcification visibility in lumpectomy specimens using a stationary digital breast tomosynthesis system** [9033-40]
A. W. Tucker, Y. Z. Lee, C. M. Kuzmiak, J. Calliste, J. Lu, O. Zhou, The Univ. of North Carolina at Chapel Hill (United States)
- 9033 17 **Evaluation of imaging geometry for stationary chest tomosynthesis** [9033-41]
J. Shan, A. W. Tucker, Y. Z. Lee, The Univ. of North Carolina at Chapel Hill (United States); M. D. Heath, X. Wang, D. Foos, Carestream Health, Inc. (United States); J. Lu, O. Zhou, The Univ. of North Carolina at Chapel Hill (United States)

SESSION 9 MULTI-ENERGY CT

- 9033 18 **CT calibration and dose minimization in image-based material decomposition with energy-selective detectors** [9033-42]
S. Faby, Deutsches Krebsforschungszentrum (Germany); S. Kuchenbecker, Deutsches Krebsforschungszentrum (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); D. Simons, H.-P. Schlemmer, Deutsches Krebsforschungszentrum (Germany); M. Lell, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); M. Kachelrieß, Deutsches Krebsforschungszentrum (Germany) and Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 9033 19 **Segmented targeted least squares estimator for material decomposition in multi-bin PCXDs** [9033-43]
P. L. Rajbhandary, S. S. Hsieh, N. J. Pelc, Stanford Univ. (United States)
- 9033 1A **Pooling optimal combinations of energy thresholds in spectroscopic CT** [9033-44]
T. Koenig, M. Zuber, E. Hamann, Karlsruher Institut für Technologie (Germany); A. Runz, Deutsches Krebsforschungszentrum (Germany); M. Fiederle, Karlsruher Institut für Technologie (Germany) and Univ. Freiburg (Germany); T. Baumbach, Karlsruher Institut für Technologie (Germany)
- 9033 1B **Effects of energy-bin acquisition methods on noise properties in photon-counting spectral CT** [9033-45]
T. Gilat Schmidt, K. C. Zimmerman, Marquette Univ. (United States); E. Y. Sidky, The Univ. of Chicago (United States)

- 9033 1C **Photon counting CT at elevated x-ray tube currents: contrast stability, image noise and multi-energy performance** [9033-46]
S. Kappler, A. Henning, B. Kreisler, F. Schöeck, K. Stierstorfer, Siemens Healthcare (Germany); T. Flohr, Siemens Healthcare (Germany) and Eberhard-Karls Univ. (Germany)
- 9033 1D **Direct spectral recovery using x-ray fluorescence measurements for material decomposition applications using photon counting spectral x-ray detectors** [9033-47]
T. Campbell-Ricketts, M. Das, Univ. of Houston (United States)

SESSION 10 MULTI-ENERGY IMAGING AND DETECTORS

- 9033 1E **Energy weighting improves the image quality of spectral mammograms: Implementation on a photon-counting mammography system** [9033-48]
J. Berglund, H. Johansson, H.-I. Maack, E. Fredenberg, Philips Healthcare (Sweden)
- 9033 1F **Spectral lesion characterization on a photon-counting mammography system** [9033-49]
K. Erhard, Philips Research (Germany); E. Fredenberg, Philips Healthcare (Sweden); H. Homann, E. Roessl, Philips Research (Germany)
- 9033 1G **Amorphous selenium direct detection CMOS digital x-ray imager with 25 micron pixel pitch** [9033-50]
C. C. Scott, S. Abbaszadeh, S. Ghanbarzadeh, Univ. of Waterloo (Canada); G. Allan, M. Farrier, Teledyne DALSA Inc. (Canada); I. A. Cunningham, Robarts Research Institute (Canada), Lawson Health Research Institute (Canada), and Univ. of Western Ontario (Canada); K. S. Karim, Univ. of Waterloo (Canada)
- 9033 1H **Reflection properties of scintillator-septum candidates for a pixelated MeV detector** [9033-51]
M. Shin, Stanford Univ. (United States); J. Star-Lack, Varian Medical Systems, Inc. (United States); M. Janecek, Rapiscan Labs, Inc. (United States); E. Abel, D. Shedlock, Varian Medical Systems, Inc. (United States); R. Fahrig, Stanford Univ. (United States)
- 9033 1I **Initial steps toward the realization of large area arrays of single photon counting pixels based on polycrystalline silicon TFTs** [9033-52]
A. K. Liang, M. Koniczek, L. E. Antonuk, Y. El-Mohri, Q. Zhao, H. Jiang, Univ. of Michigan (United States); R. A. Street, J. P. Lu, Palo Alto Research Ctr. (United States)

SESSION 11 NEW CONTRAST MECHANISMS

- 9033 1J **X-ray fluorescence molecular imaging of high-Z tracers: investigation of a novel analyzer based setup** [9033-53]
B. H. Müller, Ludwig-Maximilians-Univ. München (Germany) and Helmholtz Zentrum München GmbH (Germany); C. Hoeschen, Helmholtz Zentrum München GmbH (Germany); F. Grüner, Univ. Hamburg (Germany); T. R. C. Johnson, Ludwig-Maximilians-Univ. München (Germany)

- 9033 1K **Monte Carlo simulations of dose enhancement around gold nanoparticles used as x-ray imaging contrast agents and radiosensitizers** [9033-54]
W. B. Li, M. Müllner, M. B. Greiter, Helmholtz Zentrum München GmbH (Germany); C. Bissardon, Helmholtz Zentrum München GmbH (Germany) and Claude Bernard Univ. Lyon 1 (France); W. Z. Xie, Helmholtz Zentrum München GmbH (Germany) and Tsinghua Univ. (China); H. Schlatll, U. Oeh, Helmholtz Zentrum München GmbH (Germany); J. L. Li, Tsinghua Univ. (China); C. Hoeschen, Helmholtz Zentrum München GmbH (Germany)
- 9033 1L **Small-animal microangiography using phase-contrast x-ray imaging and gas as contrast agent** [9033-55]
U. Lundström, D. H. Larsson, KTH Royal Institute of Technology (Sweden); U. K. Westermark, Karolinska Institutet (Sweden); A. Burvall, H. M. Hertz, KTH Royal Institute of Technology (Sweden)
- 9033 1M **Small-animal dark-field radiography for pulmonary emphysema evaluation** [9033-56]
A. Yaroshenko, Technische Univ. München (Germany); F. G. Meinel, K. Hellbach, Ludwig-Maximilians-Univ. Hospital München (Germany); M. Bech, Technische Univ. München (Germany) and Lund Univ. (Sweden); A. Velroyen, M. Müller, Technische Univ. München (Germany); F. Bamberg, K. Nikolaou, M. F. Reiser, Ludwig-Maximilians-Univ. Hospital München (Germany); A. Ö. Yildirim, O. Eickelberg, Helmholtz Zentrum München GmbH (Germany); F. Pfeiffer, Technische Univ. München (Germany)
- 9033 1N **Compton coincidence volumetric imaging: a new x-ray volumetric imaging modality based on Compton scattering** [9033-57]
X. Xu, Beaumont Health Systems (United States)
- 9033 1O **Apparatus and fast method for cancer cell classification based on high harmonic coherent diffraction imaging in reflection geometry (Best Student Paper)** [9033-58]
M. Zürc, Friedrich-Schiller-Univ. Jena (Germany); S. Foertsch, Siemens AG (Germany) and Friedrich-Alexander-Univ. Erlangen (Germany); M. Matzas, Siemens AG (Germany); K. Pachmann, Univ. Hospital Jena (Germany) and Ctr. for Transfusion Medicine (Germany); R. Kuth, Siemens AG (Germany); C. Spielmann, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz-Institut Jena (Germany)

SESSION 12 DOSE

- 9033 1P **Patient-specific minimum-dose imaging protocols for statistical image reconstruction in C-arm cone-beam CT using correlated noise injection** [9033-59]
A. S. Wang, J. W. Stayman, Y. Otake, A. J. Khanna, G. L. Gallia, J. H. Siewerdsen, Johns Hopkins Univ. (United States)
- 9033 1Q **Prospective optimization of CT under tube current modulation: I. organ dose** [9033-60]
X. Tian, Duke Univ. (United States) (United States); X. Li, Cleveland State Univ. (United States); W. Segars, D. Frush, E. Samei, Duke Univ. (United States)
- 9033 1S **Size-specific dose estimates (SSDE) for a prototype orthopedic cone-beam CT system** [9033-62]
S. Richard, N. Packard, J. Yorkston, Carestream Health, Inc. (United States)

- 9033 1T **Monte Carlo investigation of backscatter factors for skin dose determination in interventional neuroradiology procedures** [9033-63]
A. Omar, Karolinska Univ. Hospital (Sweden); H. Benmakhlouf, Karolinska Univ. Hospital (Sweden) and Univ. of Stockholm (Sweden); M. Marteinsdottir, R. Bujila, P. Nowik, Karolinska Univ. Hospital (Sweden); P. Andreo, Univ. of Stockholm (Sweden)

SESSION 13 PHANTOMS

- 9033 1U **Design of anthropomorphic textured phantoms for CT performance evaluation** [9033-64]
J. Solomon, Duke Univ. (United States); F. Bochud, Lausanne Univ. Hospital (Switzerland); E. Samei, Duke Univ. (United States)
- 9033 1V **The development of a population of 4D pediatric XCAT phantoms for CT imaging research and optimization** [9033-65]
H. Norris, Y. Zhang, J. Frush, G. M. Sturgeon, A. Minhas, Duke Univ. (United States); D. J. Tward, J. T. Ratnanather, M. I. Miller, Johns Hopkins Univ. (United States); D. Frush, E. Samei, W. P. Segars, Duke Univ. (United States)
- 9033 1W **Construction of anthropomorphic hybrid dual-lattice voxel models for optimizing image quality and dose in radiography** [9033-66]
N. Petoussi-Henss, J. Becker, M. Greiter, H. Schlattl, M. Zankl, C. Hoeschen, Helmholtz Zentrum München GmbH (Germany)
- 9033 1X **Population of 100 realistic patient-based computerized breast phantoms for multi-modality imaging research** [9033-67]
W. P. Segars, Duke Univ. (United States); A. I. Veress, Univ. of Washington (United States); J. R. Wells, G. M. Sturgeon, N. Kiarashi, J. Y. Lo, E. Samei, J. T. Dobbins III, Duke Univ. (United States)

Part Two

- 9033 1Y **A second generation of physical anthropomorphic 3D breast phantoms based on human subject data** [9033-68]
A. Nolte, N. Kiarashi, E. Samei, W. P. Segars, J. Y. Lo, Duke Univ. (United States)
- 9033 1Z **Automatic insertion of simulated microcalcification clusters in a software breast phantom** [9033-69]
V. Shankla, Univ. of Pennsylvania (United States); D. D. Pokrajac, Delaware State Univ. (United States); S. P. Weinstein, M. DeLeo, C. Tuite, R. Roth, E. F. Conant, A. D. A. Maidment, P. R. Bakic, Univ. of Pennsylvania (United States)

SESSION 14 METROLOGY AND SYSTEM CHARACTERIZATION

- 9033 20 **Cascaded systems modeling of signal, noise, and DQE for x-ray photon counting detectors (Best Student Paper)** [9033-70]
J. Xu, W. Zbijewski, G. Gang, J. W. Stayman, K. Taguchi, Johns Hopkins Univ. (United States); M. Lundqvist, E. Fredenberg, Philips Women's Healthcare (Sweden); J. A. Carrino, J. H. Siewerdsen, Johns Hopkins Univ. (United States)

- 9033 21 **Detector system comparison using relative CNR for specific imaging tasks related to neuro-endovascular image-guided interventions (neuro-ElGIs)** [9033-71]
B. Loughran, S. N. Swetadri Vasan, V. Singh, C. N. Ionita, A. Jain, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9033 22 **Method for measuring the intensity profile of a CT fan-beam filter** [9033-72]
B. R. Whiting, Univ. of Pittsburgh (United States); A. Dohatcu, Univ. of Pittsburgh Medical Ctr. (United States)
- 9033 23 **Prospective optimization of CT under tube current modulation: II. image quality** [9033-73]
X. Tian, J. Wilson, D. Frush, E. Samei, Duke Univ. (United States)
- 9033 24 **A task-based comparison of two reconstruction algorithms for digital breast tomosynthesis** [9033-74]
R. Mahadevan, L. C. Ikejimba, Y. Lin, E. Samei, J. Y. Lo, Duke Univ. (United States)

SESSION 15 PERFORMANCE EVALUATION

- 9033 25 **A refined methodology for modeling volume quantification performance in CT** [9033-75]
B. Chen, J. Wilson, E. Samei, Duke Univ. (United States)
- 9033 26 **Internal noise in channelized Hotelling observer (CHO) study of detectability index-differential phase contrast CT vs. conventional CT** [9033-76]
X. Tang, Y. Yang, Emory Univ. School of Medicine (United States)
- 9033 27 **Towards continualized task-based resolution modeling in PET imaging** [9033-77]
S. Ashrafinia, N. Karakatsanis, H. Mohy-ud-Din, A. Rahmim, Johns Hopkins Univ. (United States)
- 9033 28 **CT x-ray tube voltage optimisation and image reconstruction evaluation using visual grading analysis** [9033-78]
X. Zheng, T. M. Kim, R. Davidson, Charles Sturt Univ. (Australia); S. Lee, C. Shin, Seoul National Univ. Hospital (Korea, Republic of); S. Yang, Dongshin Univ. (Korea, Republic of)
- 9033 29 **High-performance soft-tissue imaging in extremity cone-beam CT** [9033-79]
W. Zbijewski, A. Sisniega, J. W. Stayman, A. Muhit, G. Thawait, Johns Hopkins Univ. (United States); N. Packard, R. Senn, D. Yang, J. Yorkston, Carestream Health, Inc. (United States); J. A. Carrino, J. H. Siewerdsen, Johns Hopkins Univ. (United States)
- 9033 2A **Analyzing the performance of ultrasonic B-mode imaging for breast lesion diagnosis** [9033-80]
S. Bahramian, Beckman Institute, Univ. of Illinois at Urbana-Champaign (United States); C. K. Abbey, Univ. of California, Santa Barbara (United States); M. F. Insana, Beckman Institute, Univ. of Illinois at Urbana-Champaign (United States)

POSTER SESSION: ALGORITHMS AND APPLICATIONS

- 9033 2B **Investigation of the potential causes of partial scan artifacts in dynamic CT myocardial perfusion imaging** [9033-81]
Y. Tao, M. Speidel, T. Szczykutowicz, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 2C **Quantification of microarchitectural anisotropy in bone with diffraction enhanced imaging** [9033-82]
D. M. Connor Jr., M. Mehrotra, A. C. LaRue, Medical Univ. of South Carolina (United States)
- 9033 2D **Assessment of phase based dose modulation for improved dose efficiency in cardiac CT on an anthropomorphic motion phantom** [9033-83]
A. Budde, R. Nilsen, B. Nett, GE Healthcare (United States)
- 9033 2E **Image registration for motion estimation in cardiac CT** [9033-84]
B. Shi, Ohio Univ. (United States); G. Katsevich, Princeton Univ. (United States); B. S. Chiang, Toshiba Medical Research Institute (United States); A. Katsevich, Univ. of Central Florida (United States); A. Zamyatin, Toshiba Medical Research Institute (United States)
- 9033 2F **A novel Region of Interest (ROI) imaging technique for biplane imaging in interventional suites: high-resolution small field-of-view imaging in the frontal plane and dose-reduced, large field-of-view standard-resolution imaging in the lateral plane** [9033-85]
S. N. Swetadri Vasan, Univ. at Buffalo (United States) and Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States); C. Ionita, D. R. Bednarek, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States); S. Rudin, Univ. at Buffalo (United States) and Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9033 2G **Quantitative analysis of artifacts in 4D DSA: The relative contributions of beam hardening and scatter to vessel dropout behind highly attenuating structures** [9033-86]
J. Hermus, T. P. Szczykutowicz, C. M. Strother, C. Mistretta, Univ. of Wisconsin-Madison (United States)
- 9033 2H **Calibration-free coronary artery measurements for interventional device sizing using inverse geometry x-ray fluoroscopy: *in vivo* validation** [9033-87]
M. T. Tomkowiak, A. N. Raval, M. S. Van Lysel, Univ. of Wisconsin-Madison (United States); T. Funk, Triple Ring Technologies, Inc. (United States); M. A. Speidel, Univ. of Wisconsin-Madison (United States)
- 9033 2I **Necessary forward model specification accuracy for basis material decomposition in spectral CT** [9033-88]
H. Bornefalk, M. Persson, M. Danielsson, KTH Royal Institute of Technology (Sweden)
- 9033 2J **A study of the x-ray image quality improvement in the examination of the respiratory system based on the new image processing technique** [9033-90]
Y. Nagai, M. Kitagawa, J. Torii, T. Iwase, T. Aso, K. Ihara, National Cancer Ctr. Hospital (Japan); M. Fujikawa, Y. Takeuchi, K. Suzuki, T. Ishiguro, A. Hara, Hitachi Medical Corp. (Japan)
- 9033 2K **Relaxation times estimation in MRI** [9033-91]
F. Baselice, Univ. degli Studi di Napoli Parthenope (Italy); R. Caivano, A. Cammarota, IRCCS CROB (Italy); G. Ferraioli, V. Pascazio, Univ. degli Studi di Napoli Parthenope (Italy)

POSTER SESSION: CONE BEAM CT

- 9033 2L **Comparison of the effect of simple and complex acquisition trajectories on the 2D SPR and 3D voxelized differences for dedicated breast CT imaging** [9033-92]
J. P. Shah, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States);
S. D. Mann, Duke Univ. Medical Ctr. (United States); R. L. McKinley, ZumaTek, Inc. (United States); M. P. Tornai, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States)
- 9033 2M **C-arm perfusion imaging with a fast penalized maximum-likelihood approach** [9033-93]
R. Frysch, T. Pfeiffer, S. Bannasch, Otto-von-Guericke-Univ. Magdeburg (Germany);
S. Serowy, Univ. Medical Ctr. Magdeburg (Germany); S. Gugel, Otto-von-Guericke-Univ. Magdeburg (Germany); M. Skalej, Univ. Medical Ctr. Magdeburg (Germany); G. Rose, Otto-von-Guericke-Univ. Magdeburg (Germany)
- 9033 2N **Simultaneous motion estimation and image reconstruction (SMEIR) for 4D cone-beam CT** [9033-94]
J. Wang, X. Gu, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)
- 9033 2O **Three-dimensional image guided extrapolation for cone-beam CT image reconstruction** [9033-95]
B. Nett, GE Healthcare (United States)
- 9033 2P **Anti-scatter grid evaluation for wide-cone CT** [9033-96]
R. Melnyk, J. Boudry, GE Healthcare (United States); X. Liu, Missouri Univ. of Science and Technology (United States); M. Adamak, GE Healthcare (United States)
- 9033 2Q **Variance-based iterative image reconstruction from few views in limited-angle C-arm computed tomography** [9033-97]
W. El Hakimi, G. Sakas, Technische Univ. Darmstadt (Germany)
- 9033 2R **An experimental study on the noise correlation properties of CBCT projection data** [9033-98]
H. Zhang, Southern Medical Univ. (China) and The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); L. Ouyang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); J. Ma, J. Huang, W. Chen, Southern Medical Univ. (China); J. Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)
- 9033 2S **A sinogram based technique for image correction and removal of metal clip artifacts in cone beam breast CT** [9033-99]
T. Wang, Y. Shen, Y. Zhong, C.-J. Lai, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); J. Wang, First Affiliated Hospital of Xinjiang Medical Univ. (China); C. C. Shaw, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)
- 9033 2T **Preliminary study of region-of-interest image reconstruction with intensity weighting in cone-beam CT using iterative algorithm** [9033-100]
K. Son, Korea Advanced Institute of Science and Technology (Korea, Republic of) and Sungkyunkwan Univ. School of Medicine (Korea, Republic of); J. Lee, Y. Lee, J. S. Kim, S. Cho, Korea Advanced Institute of Science and Technology (Korea, Republic of)

POSTER SESSION: CONVENTIONAL CT

- 9033 2V **Reduction of metal artifacts: beam hardening and photon starvation effects** [9033-102]
G. K. Yadava, D. Pal, J. Hsieh, GE Healthcare (United States)
- 9033 2W **Acquiring tomographic images from panoramic x-ray scanners** [9033-103]
V.-G. Nguyen, Le Quy Don Technical Univ. (Viet Nam); S.-J. Lee, Paichai Univ (Korea, Republic of)
- 9033 2X **Impact of redundant ray weighting on motion artifact in a statistical iterative reconstruction framework** [9033-104]
Y. Tao, J. Tang, M. Speidel, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 2Y **Effective noise reduction and equalization in projection domain** [9033-105]
Z. Yang, A. A. Zamyatin, S. Nakanishi, Toshiba Medical Research Institute (United States)
- 9033 2Z **X-ray pulsing methods for reduced-dose computed tomography in PET/CT attenuation correction** [9033-106]
U. Wiedmann, V. B. Neculaes, D. Harrison, E. Asma, GE Global Research Ctr. (United States); P. E. Kinahan, Univ. of Washington (United States); B. De Man, GE Global Research Ctr. (United States)
- 9033 30 **Dose, noise and view weights in CT helical scans** [9033-107]
G. Cao, E. Chino, R. Nilsen, J. Hsieh, GE Healthcare (United States)
- 9033 31 **Volume estimation of multi-density nodules with thoracic CT** [9033-108]
M. A. Gavrielides, Q. Li, R. Zeng, K. J. Myers, B. Sahiner, N. Petrick, U.S. Food and Drug Administration (United States)

POSTER SESSION: CT RECONSTRUCTION

- 9033 32 **Accelerating ordered-subsets x-ray CT image reconstruction using the linearized augmented Lagrangian framework** [9033-109]
H. Nien, J. A. Fessler, Univ. of Michigan (United States)
- 9033 33 **Sinogram rebinning and frequency boosting for high resolution iterative CT reconstruction with focal spot deflection** [9033-110]
J. Wang, Y. Long, L. Fu, X. Rui, GE Global Research Ctr. (United States); E. A. Kazerooni, Univ. of Michigan Hospital (United States); B. De Man, GE Global Research Ctr. (United States)
- 9033 34 **A multi-resolution approach to retrospectively gated cardiac micro-CT reconstruction** [9033-111]
D. P. Clark, G. A. Johnson, C. T. Badea, Duke Univ. Medical Ctr. (United States)
- 9033 35 **Generalized least-squares CT reconstruction with detector blur and correlated noise models** [9033-112]
J. W. Stayman, W. Zbijewski, S. Tilley II, J. Siewerdsen, Johns Hopkins Univ. (United States)

- 9033 36 **LBP-based penalized weighted least-squares approach to low-dose cone-beam computed tomography reconstruction** [9033-113]
M. Ma, H. Wang, Y. Liu, H. Zhang, X. Gu, Z. Liang, Stony Brook Univ. (United States)
- 9033 37 **Nonlocal means-based regularizations for statistical CT reconstruction** [9033-114]
H. Zhang, Stony Brook Univ. (United States); J. Ma, Stony Brook Univ. (United States) and Southern Medical Univ. (China); Y. Liu, H. Han, Stony Brook Univ. (United States); L. Li, CUNY, College of Staten Island (United States); J. Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Z. Liang, Stony Brook Univ. (United States)
- 9033 38 **Low-dose CT reconstruction with patch based sparsity and similarity constraints** [9033-115]
Q. Xu, X. Mou, Xi'an Jiaotong Univ. (China)
- 9033 39 **Noise study on cone-beam CT FDK image reconstruction by improved area-simulating-volume technique** [9033-116]
Y. Liu, Stony Brook Univ. (United States); J. Wang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); H. Zhang, Y. Fan, Z. Liang, Stony Brook Univ. (United States)
- 9033 3A **Mojette tomographic reconstruction for micro-CT: a bone and vessels quality evaluation** [9033-117]
H. Der Sarkissian, LUNAM Univ., Univ. de Nantes, IRCCyN, CNRS (France) and KEOSYS (France); B. Recur, Australian National Univ. (Australia); J. Guédon, LUNAM Univ., Univ. de Nantes, IRCCyN, CNRS (France); P. Bléry, LUNAM Univ., Univ. de Nantes, IRCCyN, CNRS (France) and LIOAD INSERM (France); P. Pilet, LUNAM Univ., Univ. de Nantes, LIOAD INSERM (France); Y. Amouriq, LUNAM Univ., Univ. de Nantes, IRCCyN, CNRS (France) and LIOAD INSERM (France)
- 9033 3B **Two-step iterative reconstruction of region-of-interest with truncated projection in computed tomography** [9033-118]
K. Yamakawa, S. Kojima, Hitachi, Ltd. (Japan)
- 9033 3C **Multigrid iterative method with adaptive spatial support for computed tomography reconstruction from few-view data** [9033-119]
P.-C. Lee, Industrial Technology Research Institute (Taiwan)
- 9033 3D **Iterative raw measurements restoration method with penalized weighted least squares approach for low-dose CT** [9033-120]
H. Takahashi, T. Goto, K. Hirokawa, O. Miyazaki, Hitachi Medical Corp. (Japan)

POSTER SESSION: MULTI-ENERGY CT

- 9033 3E **Use of depth information from in-depth photon counting detectors for x-ray spectral imaging: a preliminary simulation study** [9033-121]
Y. Yao, Stanford Univ. (United States); H. Bornefalk, KTH Royal Institute of Technology (Sweden); S. S. Hsieh, Stanford Univ. (United States); M. Danielsson, KTH Royal Institute of Technology (Sweden); N. J. Pelc, Stanford Univ. (United States)
- 9033 3F **Fast model-based restoration of noisy and undersampled spectral CT data** [9033-122]
D. Rigie, P. J. La Riviere, Univ. of Chicago (United States)

- 9033 3G **Experimental study of two material decomposition methods using multi-bin photon counting detectors** [9033-123]
K. C. Zimmerman, Marquette Univ. (United States); E. Y. Sidky, Univ. of Chicago (United States); T. Gilat Schmidt, Marquette Univ. (United States)
- 9033 3H **Prostate tissue decomposition via DECT using the model based iterative image reconstruction algorithm DIRA** [9033-124]
A. Malusek, M. Magnusson, M. Sandborg, R. Westin, G. Alm Carlsson, Linköping Univ. (Sweden)
- 9033 3I **Investigation of the polynomial approach for material decomposition in spectral x-ray tomography using an energy-resolved detector** [9033-125]
A. Potop, CEA-LETI (France) and CREATIS, CNRS, Univ. de Lyon (France); V. Rebuffel, J. Rinkel, A. Brambilla, CEA-LETI (France); F. Peyrin, CREATIS, CNRS, Univ. de Lyon (France); L. Verger, CEA-LETI (France)
- 9033 3J **Enabling photon counting detectors with dynamic attenuators** [9033-126]
S. S. Hsieh, N. J. Pelc, Stanford Univ. (United States)
- 9033 3K **Noise balance in pre-reconstruction decomposition in spectral CT** [9033-127]
X. Wang, Y. Zou, Toshiba Medical Research Institute (United States)
- 9033 3L **Energy-resolved CT imaging with a photon-counting silicon-strip detector** [9033-128]
M. Persson, B. Huber, S. Karlsson, X. Liu, H. Chen, C. Xu, M. Yveborg, H. Bornefalk, M. Danielsson, KTH Royal Institute of Technology (Sweden)

POSTER SESSION: DETECTORS

- 9033 3M **Characterization of a hybrid energy-resolving photon-counting detector** [9033-129]
A. Zang, G. Pelzer, G. Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); R. Ballabriga Sune, CERN (Switzerland); F. Bisello, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany) and IBA Dosimetry GmbH (Germany); M. Campbell, CERN (Switzerland); A. Fauler, M. Fiederle, FMF-Freiburger Materialforschungszentrum (Germany); X. Llopart Cudie, CERN (Switzerland); I. Ritter, F. Tennert, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); S. Wölfel, IBA Dosimetry GmbH (Germany); W. S. Wong, CERN (Switzerland); T. Michel, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 9033 3N **X-ray light valve (XLV): a novel detectors' technology for digital mammography** [9033-130]
S. Marcovici, V. Sukhovatkin, P. Oakham, XLV Diagnostics, Inc. (Canada)
- 9033 3O **Characterization of a silicon strip detector for photon-counting spectral CT using monoenergetic photons from 40 keV to 120 keV** [9033-131]
X. Liu, H. Bornefalk, H. Chen, M. Danielsson, S. Karlsson, M. Persson, C. Xu, B. Huber, KTH Royal Institute of Technology (Sweden)
- 9033 3P **Experimental and theoretical performance analysis for a CMOS-based high resolution image detector** [9033-132]
A. Jain, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)

- 9033 3Q **Measurement of imaging properties of scintillating fiber optic plate** [9033-133]
G. Zentai, A. Ganguly, J. Star-Lack, G. Virshup, H. Hirsh, D. Shedlock, D. Humber, Varian Medical Systems, Inc. (United States)

Part Three

- 9033 3R **Optimizing two radioluminescence based quality assurance devices for diagnostic radiology utilizing a simple model** [9033-134]
J. Lindström, Karolinska Univ. Hospital (Sweden) and Linköping Univ. (Sweden); M. Hulthén, Karolinska Univ. Hospital (Sweden); G. Alm Carlsson, M. Sandborg, Linköping Univ. (Sweden)
- 9033 3S **Investigation of spatial resolution and temporal performance of SAPHIRE (scintillator avalanche photoconductor with high resolution emitter readout) with integrated electrostatic focusing** [9033-135]
D. A. Scaduto, A. R. Lubinsky, J. A. Rowlands, Stony Brook Univ. (United States); H. Kenmotsu, N. Nishimoto, T. Nishino, NanoX Japan (Japan); K. Tanioka, Tokyo Denki Univ. (Japan); W. Zhao, Stony Brook Univ. (United States)
- 9033 3T **Imaging performance of a thin $\text{Lu}_2\text{O}_3\text{:Eu}$ nanophosphor scintillating screen coupled to a high resolution CMOS sensor under x-ray radiographic conditions: comparison with $\text{Gd}_2\text{O}_2\text{S:Eu}$ conventional phosphor screen** [9033-136]
I. Seferis, Wroclaw Univ. (Poland) and Univ. of Patras (Greece); C. Michail, I. Valais, Technological Educational Institute of Athens (Greece); J. Zeler, Wroclaw Univ. (Poland); P. Liaparinos, N. Kalyvas, G. Fountos, Technological Educational Institute of Athens (Greece); E. Zych, Wroclaw Univ. (Poland); I. Kandarakis, Technological Educational Institute of Athens (Greece); G. Panayiotakis, Univ. of Patras (Greece)
- 9033 3U **Physical properties of a new flat panel detector with irradiated side sampling (ISS) technology** [9033-137]
M. Fiebich, J. M. Burg, C. Piel, Technische Hochschule Mittelhessen (Germany); L. Rodenheber, Justus Liebig Univ. Giessen (Germany); P. Penchev, Technische Hochschule Mittelhessen (Germany); G. A. Krombach, Justus Liebig Univ. Giessen (Germany)
- 9033 3V **MTF characterization in 2D and 3D for a high resolution large field of view flat panel imager for cone beam CT** [9033-138]
J. P. Shah, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States); S. D. Mann, Duke Univ. Medical Ctr. (United States); M. P. Tornai, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States); M. Richmond, G. Zentai, Varian Medical Systems, Inc. (United States)
- 9033 3W **Comparing analytical and Monte Carlo optical diffusion models in phosphor-based x-ray detectors** [9033-139]
N. Kalyvas, P. Liaparinos, Technological Educational Institute of Athens (Greece)

POSTER SESSION: DOSE

- 9033 3Y **Radio-fluorogenic dosimetry with violet diode laser-induced fluorescence** [9033-142]
P. Sandwall, H. Spitz, H. Elson, M. Lamba, W. Connick, H. Fenichel, Univ. of Cincinnati (United States)
- 9033 3Z **Comparison of different approaches of estimating effective dose from reported exposure data in 3D imaging with interventional fluoroscopy systems** [9033-143]
A. Svalkvist, J. Hansson, M. Båth, Univ. of Gothenburg (Sweden) and Sahlgrenska Univ. Hospital (Sweden)
- 9033 40 **Improved-resolution real-time skin-dose mapping for interventional fluoroscopic procedures** [9033-144]
V. K. Rana, S. Rudin, D. R. Bednarek, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9033 41 **Beam hardening and partial beam hardening of the bowtie filter: effects on dosimetric applications in CT** [9033-145]
X. Lopez-Rendon, Katholieke Univ. Leuven (Belgium); G. Zhang, Mayo Clinic (United States); H. Bosmans, R. Oyen, F. Zanca, Katholieke Univ. Leuven (Belgium)
- 9033 42 **CT-guided brachytherapy of prostate cancer: reduction of effective dose from x-ray examination** [9033-146]
D. B. Sanin, Medical Radiological Research Ctr. (Russian Federation) and Ctr. of Brachytherapy of Prostate Cancer (Russian Federation); V. A. Biryukov, S. S. Rusetskiy, Medical Radiological Research Ctr. (Russian Federation); P. V. Sviridov, T. V. Volodina, Ctr. of Brachytherapy of Prostate Cancer (Russian Federation)

POSTER SESSION: MAMMOGRAPHY

- 9033 43 **X-ray scatter characterization in dedicated breast CT with bowtie filters** [9033-147]
K. Kontson, R. J. Jennings, U.S. Food and Drug Administration (United States) and Univ. of Maryland (United States)
- 9033 44 **A simple scatter correction method for dual energy contrast-enhanced digital breast tomosynthesis** [9033-148]
Y. Lu, B. Lau, Y.-H. Hu, W. Zhao, G. Gindi, Stony Brook Univ. (United States)
- 9033 45 **Development of mammography system using CdTe photon counting detector for the exposure dose reduction** [9033-149]
S. Maruyama, N. Niwa, M. Yamazaki, Nagoya Univ. (Japan); T. Yamakawa, T. Nagano, Telesystems Co. (Japan); Y. Kodera, Nagoya Univ. (Japan)
- 9033 46 **On imaging with or without grid in digital mammography** [9033-150]
H. Chen, M. Danielsson, B. Cederström, KTH Royal Institute of Technology (Sweden)
- 9033 47 **Estimation of effective x-ray tissue attenuation differences for volumetric breast density measurement** [9033-151]
B. Chen, C. Ruth, Z. Jing, B. Ren, A. Smith, A. Kshirsagar, Hologic, Inc. (United States)

- 9033 48 **Improving the spatial resolution characteristics of dedicated cone-beam breast CT technology** [9033-152]
P. Gazi, J. M. Boone, Univ. of California Davis (United States)
- 9033 49 **Spectrum optimization for computed radiography systems** [9033-153]
J. Hummel, Medizinische Univ. Wien (Austria) and Wilhelminenspital (Austria); F. Semturs, M. Kaar, P. Homolka, M. Figl, Medizinische Univ. Wien (Austria)

POSTER SESSION: NEW IMAGING CONCEPTS

- 9033 4A **Feasibility study of spectral computed tomography (CT) with gold as a new contrast agent (Best Student Paper)** [9033-155]
M. Müllner, H. Schlattl, U. Oeh, C. Hoeschen, Helmholtz Zentrum München GmbH (Germany); O. Dietrich, Ludwig-Maximilians-Univ. Hospital München (Germany)
- 9033 4B **Projection-based energy weighting on photon-counting x-ray images in digital subtraction mammography: a feasibility study** [9033-156]
S.-H. Choi, S.-W. Lee, Y.-N. Choi, Y.-J. Lee, H.-J. Kim, Yonsei Univ. (Korea, Republic of)
- 9033 4C **High resolution x-ray fluorescence imaging for a microbeam radiation therapy treatment planning system** [9033-157]
P. Chtcheprov, C. Inscoe, L. Burk, R. Ger, H. Yuan, J. Lu, The Univ. of North Carolina at Chapel Hill (United States); S. Chang, O. Zhou, The Univ. of North Carolina at Chapel Hill (United States) and UNC Lineberger Comprehensive Cancer Ctr. (United States)
- 9033 4D **Development of an MRI fiducial marker prototype for automated MR-US fusion of abdominal images** [9033-158]
C. P. Favazza, K. R. Gorny, Mayo Clinic (United States); M. J. Washburn, GE Healthcare (United States); N. J. Hangiandreou, Mayo Clinic (United States)
- 9033 4E **Comparison between optimized GRE and RARE sequences for ^{19}F MRI studies** [9033-159]
C. D. Soffientini, Politecnico di Milano (Italy); A. Mastropietro, Fondazione IRCCS Istituto Neurologico C. Besta (Italy); M. Caffini, S. Cocco, Politecnico di Milano (Italy); I. Zucca, A. Scotti, Fondazione IRCCS Istituto Neurologico C. Besta (Italy); G. Baselli, Politecnico di Milano (Italy); M. G. Bruzzone, Fondazione IRCCS Istituto Neurologico C. Besta (Italy)
- 9033 4G **A new resonance-frequency based electrical impedance spectroscopy and its application in biomedical engineering** [9033-161]
S. Dhurjaty, Dhurjaty Electronics Consulting LLC (United States); Y. Qiu, M. Tan, B. Zheng, The Univ. of Oklahoma (United States)

POSTER SESSION: NUCLEAR MEDICAL IMAGING

- 9033 4H **A simple model for deep tissue attenuation correction and large organ analysis of Cerenkov luminescence imaging** [9033-164]
F. Habte, A. Natarajan, D. S. Paik, S. S. Gambhir, Stanford Univ. School of Medicine (United States)

- 9033 4I **Improved attenuation correction for freely moving animal brain PET studies using a virtual scanner geometry** [9033-165]
G. I. Angelis, W. J. Ryder, A. Z. Kyme, R. R. Fulton, S. R. Meikle, The Univ. of Sydney (Australia)
- 9033 4J **Optimization using detective quantum efficiency (DQE) of the high-resolution parallel-hole collimators with CdTe pixelated semiconductor SPECT system** [9033-166]
Y.-J. Lee, D.-H. Kim, Y. Kim, H.-J. Kim, Yonsei Univ. (Korea, Republic of)
- 9033 4K **A novel intra-operative positron imager for rapid localization of tumor margins** [9033-167]
H. Sabet, Radiation Monitoring Devices, Inc. (United States); B. C. Stack, Univ. of Arkansas for Medical Sciences (United States); V. V. Nagarkar, Radiation Monitoring Devices, Inc. (United States)
- 9033 4M **Image reconstruction for the new simultaneous whole-body openPET/CT geometry** [9033-169]
Y. Yin, Tokyo Institute of Technology (Japan); H. Tashima, National Institute of Radiological Sciences (Japan); T. Obi, Tokyo Institute of Technology (Japan); T. Yamaya, National Institute of Radiological Sciences (Japan)

POSTER SESSION: PHANTOMS AND RADIATION TRANSPORT

- 9033 4N **Including the effect of molecular interference in the coherent x-ray scattering modeling in MC-GPU and PENELOPE for the study of novel breast imaging modalities** [9033-170]
B. Ghamraoui, R. Peng, I. Suarez, C. Bettolo, A. Badal, U.S. Food and Drug Administration (United States)
- 9033 4O **Evaluation of the resolving potency of a novel reconstruction filter on periodontal ligament space with dental cone-beam CT: a quantitative phantom study** [9033-171]
Y. Houno, Nagoya Univ. (Japan); T. Hishikawa, K. Gotoh, M. Naitoh, E. Aiji, Aichi-Gakuin Univ. (Japan); Y. Koderu, Nagoya Univ. (Japan)
- 9033 4P **Unfiltered Monte Carlo-based tungsten anode spectral model from 20 to 640 kV** [9033-172]
A. M. Hernandez, J. M. Boone, Univ. of California, Davis (United States)
- 9033 4R **Hybrid-model for computed tomography simulations and post-patient collimator design** [9033-174]
H. Xu, K. Tao, GE Global Research Ctr. (China); P. GK, GE Healthcare Bio-Sciences Ltd. (India); M. Wu, GE Global Research Ctr. (China); X. Cao, GE Healthcare (China); Y. Long, GE Global Research Ctr. (United States); M. Yan, Y. Yao, GE Global Research Ctr. (China); B. De Man, GE Global Research Ctr. (United States)
- 9033 4S **Physics-based modeling of x-ray CT measurements with energy-integrating detectors** [9033-175]
Y. Long, GE Global Research Ctr. (United States); H. Gao, GE Healthcare Technologies (United States); M. Wu, GE China Technology Ctr. (China); J. D. Pack, GE Global Research Ctr. (United States); H. Xu, K. Tao, GE China Technology Ctr. (China); P. F. Fitzgerald, B. De Man, GE Global Research Ctr. (United States)

- 9033 4T **Quantification of biological tissue and construction of patient equivalent phantom (skull and chest) for infants (1-5 years old)** [9033-176]
A. F. Alves, D. R. Pina, F. A. Bacchim Neto, S. M. Ribeiro, J. R. A. Miranda, Univ. Estadual Paulista (Brazil)
- 9033 4U **Guidewire path simulation using equilibrium of forces** [9033-177]
F. M. Cardoso, S. S. Furuie, Univ. de São Paulo (Brazil)
- 9033 4V **Optical crosstalk in CT detectors and its effects on CT images** [9033-178]
H. Youn, S. Kam, J. C. Han, H. K. Kim, Pusan National Univ. (Korea, Republic of)
- 9033 4W **A comparison of simulation tools for photon-counting spectral CT** [9033-179]
R. A. Nasirudin, Technische Univ. München (Germany); P. Penchev, Technische Hochschule Mittelhessen (Germany); K. Mei, E. J. Rummeny, Technische Univ. München (Germany); M. Fiebich, Technische Hochschule Mittelhessen (Germany); P. B. Noël, Technische Univ. München (Germany)

POSTER SESSION: PHASE CONTRAST IMAGING

- 9033 4X **Optimization of grating-based phase-contrast imaging setup** [9033-180]
P. Baturin, M. Shafer, Carestream Health, Inc. (United States)
- 9033 4Y **Design of a compact high-energy setup for x-ray phase-contrast imaging** [9033-181]
M. Schüttler, Technische Univ. München (Germany) and Karlsruher Institut für Technologie (Germany); A. Yaroshenko, Technische Univ. München (Germany); M. Bech, Technische Univ. München (Germany) and Lund Univ. (Sweden); G. Potdevin, A. Malecki, M. Chabior, J. Wolf, A. Tapfer, Technische Univ. München (Germany); J. Meiser, D. Kunka, M. Amberger, J. Mohr, Karlsruher Institut für Technologie (Germany); F. Pfeiffer, Technische Univ. München (Germany)
- 9033 4Z **Multilayer coated gratings for phase-contrast computed tomography (CT)** [9033-182]
Z. Marton, H. B. Bhandari, Radiation Monitoring Devices, Inc. (United States); H. H. Wen, National Heart, Lung, and Blood Institute (United States); V. V. Nagarkar, Radiation Monitoring Devices, Inc. (United States)
- 9033 51 **Analysis of a deconvolution-based information retrieval algorithm in x-ray grating-based phase-contrast imaging** [9033-184]
F. Horn, F. Bayer, G. Pelzer, J. Rieger, A. Ritter, T. Weber, A. Zang, T. Michel, G. Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)
- 9033 52 **Energy weighting in grating-based x-ray phase-contrast imaging** [9033-185]
G. Pelzer, T. Weber, G. Anton, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); R. Ballabriga Sune, CERN (Switzerland); F. Bayer, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); M. Campbell, CERN (Switzerland); W. Haas, F. Horn, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); X. Llopart Cudie, CERN (Switzerland); N. Michel, CMS-Schnaittach (Germany); U. Mollenbauer, IBA Dosimetry GmbH (Germany); J. Rieger, A. Ritter, I. Ritter, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); S. Wölfel, IBA Dosimetry GmbH (Germany); W. S. Wong, CERN (Switzerland); A. Zang, T. Michel, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany)

- 9033 53 **Comparison of propagation- and grating-based x-ray phase-contrast imaging techniques with a liquid-metal-jet source** [9033-186]
T. Zhou, U. Lundström, KTH Royal Institute of Technology (Sweden); T. Thüring, S. Rutishauser, Paul Scherrer Institut (Switzerland) and Swiss Federal Institute of Technology (Switzerland); D. H. Larsson, KTH Royal Institute of Technology (Sweden); M. Stampanoni, Paul Scherrer Institut (Switzerland) and Swiss Federal Institute of Technology (Switzerland); C. David, Paul Scherrer Institut (Switzerland); H. M. Hertz, A. Burvall, KTH Royal Institute of Technology (Sweden)
- 9033 55 **Increasing the field of view of x-ray phase contrast imaging using stitched gratings on low absorbent carriers** [9033-188]
J. Meiser, M. Amberger, Karlsruher Institut für Technologie (Germany); M. Willner, Technische Univ. München (Germany); D. Kunka, P. Meyer, F. Koch, Karlsruher Institut für Technologie (Germany); A. Hipp, Helmholtz-Zentrum Geesthacht (Germany); M. Walter, microworks GmbH (Germany); F. Pfeiffer, Technische Univ. München (Germany); J. Mohr, Karlsruher Institut für Technologie (Germany)
- 9033 57 **Effect of coherence loss in differential phase contrast imaging** [9033-191]
W. Cai, Univ. of Rochester Medical Ctr. (United States); R. Ning, Univ. of Rochester Medical Ctr. (United States), Univ. of Rochester (United States), and Koning Corp. (United States); J. Liu, Univ. of Rochester (United States)
- 9033 58 **Effect of object size, position, and detector pixel size on x-ray absorption, differential phase-contrast and dark-field signal** [9033-192]
J. Wolf, M. Chabior, Technische Univ. München (Germany); J. Sperl, GE Global Research Ctr. (Germany); A. Malecki, Technische Univ. München (Germany); D. Bequé, C. Cozzini, GE Global Research Ctr. (Germany); F. Pfeiffer, Technische Univ. München (Germany)

POSTER SESSION: RECONSTRUCTION

- 9033 59 **Pre-computed backprojection based penalized-likelihood (PPL) reconstruction with an edge-preserved regularizer for stationary Digital Breast Tomosynthesis** [9033-194]
S. Xu, Southern Illinois Univ. Carbondale (United States); C. R. Inscoe, J. Lu, O. Zhou, The Univ. of North Carolina at Chapel Hill (United States) and UNC Lineberger Comprehensive Cancer Ctr. (United States); Y. Chen, Southern Illinois Univ. Carbondale (United States)
- 9033 5A **Digital breast tomosynthesis reconstruction with an adaptive voxel grid** [9033-195]
B. Claus, GE Global Research Ctr. (United States); H.-P. Chan, Univ. of Michigan (United States)
- 9033 5B **List-mode PET image reconstruction for motion correction using the Intel XEON PHI co-processor** [9033-196]
W. J. Ryder, G. I. Angelis, R. Bashar, J. E. Gillam, The Univ. of Sydney (Australia); R. Fulton, The Univ. of Sydney (Australia) and Westmead Hospital (Australia); S. Meikle, The Univ. of Sydney (Australia)
- 9033 5C **Statistical iterative reconstruction using fast optimization transfer algorithm with successively increasing factor in Digital Breast Tomosynthesis** [9033-197]
S. Xu, Southern Illinois Univ. Carbondale (United States); Z. Zhang, Xi'an Jiaotong Univ. (China); Y. Chen, Southern Illinois Univ. Carbondale (United States)

- 9033 5D **Iterative reconstruction of volumetric modulated arc radiotherapy plans using control point basis vectors** [9033-198]
J. C. Barbiere, A. Kapulsky, A. Ndlovu, John Theurer Cancer Ctr. at Hackensack Univ. Medical Ctr. (United States)
- 9033 5E **Investigation of the quantitative accuracy of 3D iterative reconstruction algorithms in comparison to filtered back projection method: a phantom study** [9033-199]
N. Abuhadi, D. Bradley, Univ. of Surrey (United Kingdom); D. Katarey, Kingston Hospital NHS Trust (United Kingdom); Z. Podolyak, Univ. of Surrey (United Kingdom); S. Sassi, Prince Sultan Medical Military City (Saudi Arabia)

POSTER SESSION: SYSTEM CHARACTERIZATION

- 9033 5F **Focal spot measurements using a digital flat panel detector** [9033-200]
A. Jain, A. Panse, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9033 5G **Dose reduction in CT with correlated-polarity noise reduction: context-dependent spatial resolution and noise properties demonstrating two-fold dose reduction with minimal artifacts** [9033-201]
J. T. Dobbins III, J. R. Wells, W. Segars, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States)
- 9033 5H **Validation of an image-based technique to assess the perceptual quality of clinical chest radiographs with an observer study** [9033-202]
Y. Lin, K. R. Choudhury, H. P. McAdams, Duke Univ. (United States); D. H. Foos, Carestream Health, Inc. (United States); E. Samei, Duke Univ. (United States)
- 9033 5I **Relative object detectability (ROD): a new metric for comparing x-ray image detector performance for a specified object of interest** [9033-203]
V. Singh, A. Jain, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)
- 9033 5J **Noise performance of statistical model based iterative reconstruction in clinical CT systems** [9033-204]
K. Li, J. Tang, G.-H. Chen, Univ. of Wisconsin-Madison (United States)
- 9033 5K **Comparison of deconvolution techniques to measure directional MTF of FDK reconstruction** [9033-205]
C. Lee, J. Park, Y. Ko, J. Baek, Yonsei Univ. (Korea, Republic of)

POSTER SESSION: SYSTEM REPORTS

- 9033 5M **A spectral CT technique using balanced K-edge filter set (Best Poster Award)** [9033-207]
Y. Rakvongthai, Massachusetts General Hospital (United States); W. Worstell, Photo Diagnostic Systems Inc. (United States) and Massachusetts General Hospital (United States); G. El Fakhri, J. Ouyang, Massachusetts General Hospital (United States)

- 9033 5N **A flat-field correction method for photon-counting-detector-based micro-CT** [9033-208]
S. E. Park, J. G. Kim, M. A. A. Hegazy, M. H. Cho, S. Y. Lee, Kyung Hee Univ. (Korea, Republic of)
- 9033 5O **Design of a nested SPECT-CT system with fully suspended CT sub-system for dedicated breast imaging** [9033-209]
J. P. Shah, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States); S. D. Mann, Duke Univ. Medical Ctr. (United States); R. L. McKinley, ZumaTek, Inc. (United States); M. P. Tornai, Duke Univ. (United States) and Duke Univ. Medical Ctr. (United States)
- 9033 5P **Phase contrast portal imaging for image-guided microbeam radiation therapy** [9033-210]
K. Umetani, Japan Synchrotron Radiation Research Institute (Japan); T. Kondoh, Kobe Univ. Graduate School of Medicine (Japan)
- 9033 5Q **Rotating and semi-stationary multi-beamline architecture study for cardiac CT imaging** [9033-211]
J. Wang, P. Fitzgerald, H. Gao, Y. Jin, GE Global Research Ctr. (United States); G. Wang, Rensselaer Polytechnic Institute (United States); B. De Man, GE Global Research Ctr. (United States)
- 9033 5R **Determination of minor and trace elements in kidney stones by x-ray fluorescence analysis** [9033-212]
A. Srivastava, B. J. Heisinger, V. Sinha, H.-K. Lee, X. Liu, Missouri Univ. of Science and Technology (United States); M. Qu, X. Duan, S. Leng, C. H. McCollough, Mayo Clinic (United States)
- 9033 5S **Workflow for the use of a high-resolution image detector in endovascular interventional procedures** [9033-213]
R. Rana, B. Loughran, S. N. Swetadri Vasan, L. Pope, C. N. Ionita, A. Siddiqui, N. Lin, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)

POSTER SESSION: TOMOSYNTHESIS AND MULTI-ENERGY IMAGING

- 9033 5T **Feasibility of active sandwich detectors for single-shot dual-energy imaging (Best Poster Award)** [9033-214]
S. Yun, J. C. Han, D. W. Kim, H. Youn, H. K. Kim, Pusan National Univ. (Korea, Republic of); J. Tanguay, Univ. of British Columbia (Canada); I. A. Cunningham, Robarts Research Institute (Canada) and Univ. of Western Ontario (Canada)
- 9033 5V **Assessing and improving cobalt-60 digital tomosynthesis image quality** [9033-216]
M. B. Marsh, Cancer Ctr. of Southeastern Ontario (Canada); L. J. Schreiner, A. T. Kerr, Cancer Ctr. of Southeastern Ontario (Canada) and Queen's Univ. (Canada)
- 9033 5W **2D and 3D registration methods for dual-energy contrast-enhanced digital breast tomosynthesis** [9033-217]
K. C. Lau, S. Roth, A. D. A. Maidment, Univ. of Pennsylvania (United States)

POSTER SESSION: X-RAY IMAGING

- 9033 60 **Model predictions for the WAXS signals of healthy and malignant breast duct biopsies** [9033-221]
R. J. LeClair, Laurentian Univ. (Canada)
- 9033 61 **X-ray coherent scatter imaging for surgical margin detection: a Monte Carlo study** [9033-222]
M. N. Lakshmanan, A. J. Kapadia, B. P. Harrowood, Duke Univ. Medical Ctr. (United States);
D. Brady, Duke Univ. (United States); E. Samei, Duke Univ. Medical Ctr. (United States) and
Duke Univ. (United States)
- 9033 62 **Limitations of anti-scatter grids when used with high resolution image detectors** [9033-223]
V. Singh, A. Jain, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ.
at Buffalo (United States)
- 9033 64 **Scatter reduction for high resolution image detectors with a region of interest attenuator** [9033-225]
A. Jain, D. R. Bednarek, S. Rudin, Toshiba Stroke and Vascular Research Ctr., Univ. at
Buffalo (United States)
- 9033 65 **Potential use of a single scatter model in breast CBCT applications** [9033-226]
C. Laamanen, R. J. LeClair, Laurentian Univ. (Canada)

Author Index

Conference Committee

Symposium Chairs

Ehsan Samei, Duke University (United States)
David J. Manning, Lancaster University (United Kingdom)

Conference Chairs

Bruce R. Whiting, University of Pittsburgh (United States)
Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany)

Conference Co-Chair

Despina Kontos, The University of Pennsylvania (United States)

Conference Program Committee

Andreu Badal, U.S. Food and Drug Administration (United States)
Kirsten Boedeker, Toshiba Medical Research Institute USA
(United States)
Hilde Bosmans, University Hospitals of KU Leuven (Belgium)
Guang-Hong Chen, University of Wisconsin School of Medicine and
Public Health (United States)
Mats E. Danielsson, KTH Royal Institute of Technology (Sweden)
Mini Das, University of Houston (United States)
Maria Drangova, Robarts Research Institute (Canada) and University
of Western Ontario (Canada)
Thomas G. Flohr, Siemens Healthcare (Germany) and Eberhard Karls
Universität Tübingen (Germany)
Stephen J. Glick, University of Massachusetts Medical School
(United States)
Michael Grass, Philips Research (Germany)
Marc Kachelrieß, Deutsches Krebsforschungszentrum (DKFZ)
(Germany)
Karim S. Karim, University of Waterloo (Canada)
Hee-Joung Kim, Yonsei University (Korea, Republic of)
Joseph Y. Lo, Duke University (United States)
Robert M. Nishikawa, University of Pittsburgh (United States)
Norbert J. Pelc, Stanford University (United States)
Jinyi Qi, University of California, Davis (United States)
John A. Rowlands, Thunder Bay Regional Research Institute (Canada)
John M. Sabol, GE Healthcare (United States)
Taly G. Schmidt, Marquette University (United States)
Anders Tingberg, Lund University (Sweden)

John Yorkston, Carestream Health Technology and Innovation
Center (United States)

Session Chairs

- 1 Keynote and Cardiac CT
Bruce R. Whiting, University of Pittsburgh (United States)
Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany)
- 2 CT and Applications
Taly G. Schmidt, Marquette University (United States)
Robert M. Nishikawa, University of Pittsburgh (United States)
- 3 Phase Contrast Imaging
Mini Das, University of Houston (United States)
Thomas G. Flohr, Siemens Healthcare (Germany) and Eberhard Karls
Universität Tübingen (Germany)
- 4 Algorithms
Thomas G. Flohr, Siemens Healthcare (Germany) and Eberhard Karls
Universität Tübingen (Germany)
Kirsten Boedeker, Toshiba Medical Research Institute USA
(United States)
- 5 CT Reconstructions
Guang-Hong Chen, University of Wisconsin-Madison (United States)
Marc Kachelriess, Deutsches Krebsforschungszentrum (Germany)
- 6 Reconstruction
Jinyi Qi, University of California, Davis (United States)
Despina Kontos, The University of Pennsylvania (United States)
- 7 Cone Beam CT and Novel Design
Stephen J. Glick, University of Massachusetts Medical School
(United States)
Michael Grass, Philips Research (Germany)
- 8 Tomosynthesis
John M. Sabol, GE Healthcare (United States)
Anders Tingberg, Lund University (Sweden)
- 9 Multi-energy CT
John A. Rowlands, Thunder Bay Regional Research Institute (Canada)
Taly G. Schmidt, Marquette University (United States)

- 10 Multi-energy Imaging and Detectors
John A. Rowlands, Thunder Bay Regional Research Institute (Canada)
Joseph Y. Lo, Duke University Medical Center (United States)
- 11 New Contrast Mechanisms
Norbert J. Pelc, Stanford University (United States)
Maria Drangova, Robarts Research Institute (Canada)
- 12 Dose
Andreu Badal, U.S. Food and Drug Administration (United States)
Hilde Bosmans, Katholieke Universiteit Leuven (Belgium)
- 13 Phantoms
Bruce R. Whiting, University of Pittsburgh (United States)
Andreu Badal, U.S. Food and Drug Administration (United States)
- 14 Metrology and System Characterization
Karim S. Karim, University of Waterloo (Canada)
Joseph Y. Lo, Duke University Medical Center (United States)
- 15 Performance Evaluation
Despina Kontos, The University of Pennsylvania (United States)
Christoph Hoeschen, Helmholtz Zentrum München GmbH (Germany)

Awards



Robert F. Wagner 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 cosponsored by:



The Medical Image Perception Society

SPIE[®]

2014 Recipients:

First Place: **MRI signal and texture features for the prediction of MCI to Alzheimer's disease progression** (9035-78)

A. Martínez-Torteya, J. A. Rodríguez-Rojas, J. M. Celaya-Padilla, J. I. Galván-Tejada, V. M. Treviño-Alvarado, Sr., J. G. Tamez-Peña, Tecnológico de Monterrey (Mexico)

Second Place: **Distinguishing benign confounding treatment changes from residual prostate cancer on MRI following laser ablation** (9036-49)

G. Litjens, H. Huisman, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); R. Elliot, Case Western Reserve Univ. (United States); N. Shih, M. Feldman, Univ. of Pennsylvania (United States); S. Viswnath, Case Western Reserve Univ. (United States); J. Futterer, J. Bomers, Radboud Univ. Nijmegen Medical Ctr. (Netherlands); A. Madabhushi, Case Western Reserve Univ. (United States)

Conference Awards

2014 Recipients:

Best Student Paper Awards sponsored by Carestream

First Place

Apparatus and fast method for cancer cell classification based on high harmonic coherent diffraction imaging in reflection geometry [9033-58]

M. Zürich, Friedrich-Schiller-Univ. Jena (Germany); S. Foertsch, Siemens AG (Germany) and Friedrich-Alexander-Univ. Erlangen (Germany); M. Matzas, Siemens AG (Germany); K. Pachmann, Univ. Hospital Jena (Germany) and Ctr. for Transfusion Medicine (Germany); R. Kuth, Siemens AG (Germany); C. Spielmann, Friedrich-Schiller-Univ. Jena (Germany) and Helmholtz Institute Jena (Germany)

Second Place

Cascaded systems modeling of signal, noise, and DQE for x-ray photon counting detectors [9033-70]

J. Xu, W. Zbijewski, G. Gang, J. W. Stayman, K. Taguchi, Johns Hopkins Univ. (United States); M. Lundqvist, E. Fredenberg, Philips Women's Healthcare (Sweden); J. A. Carrino, J. H. Siewerdsen, Johns Hopkins Univ. (United States)

Third Place

Feasibility study of spectral computed tomography (CT) with gold as a new contrast agent [9033-155]

M. Müllner, H. Schlattl, U. Oeh, C. Hoeschen, Helmholtz Zentrum München GmbH (Germany); O. Dietrich, Ludwig-Maximilians-Univ. Hospital München (Germany)

Poster Awards sponsored by GE Healthcare

First Place

Feasibility of active sandwich detectors for single-shot dual-energy imaging [9033-214]

S. Yun, J. C. Han, D. W. Kim, H. Youn, H. K. Kim, Pusan National Univ. (Korea, Republic of); J. Tanguay, Univ. of British Columbia (Canada); I. A. Cunningham, Robarts Research Institute (Canada) and Univ. of Western Ontario (Canada)

Runner Up

A spectral CT technique using balanced K-edge filter set [9033-207]

Y. Rakvongthai, Massachusetts General Hospital (United States); W. Worstell, Photo Diagnostic Systems Inc. (United States) and Massachusetts General Hospital (United States); G. El Fakhri, J. Ouyang, Massachusetts General Hospital (United States)