

Third International Conference on Image Formation in X-Ray Computed Tomography 2014

Salt Lake City, Utah, USA
22 – 25 June 2014

ISBN: 978-1-5108-5713-1

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2014) by Utah Center For Advanced Imaging Research (UCAIR)
All rights reserved.

Printed by Curran Associates, Inc. (2018)

For permission requests, please contact Utah Center For Advanced Imaging Research (UCAIR)
at the address below.

Utah Center For Advanced Imaging Research (UCAIR)
729 Arapeen Drive
Salt Lake City, UT 84108-1217
USA

Phone: 801-581-5221
Fax: 801-585-3592

Medicine.utah.edu/ucair

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

Session M1: Spectral CT imaging

Moderated by Bresler Y (University of Illinois & Instarecon) and Glick S (UMass Medical School)

| | |
|---|----|
| Optimization-based direct inversion of spectral CT data into a materials decomposition | 1 |
| Sidky E Y, Gilat-Schmidt T, Pan X <i>The University of Chicago, Chicago IL, USA; Marquette University, Milwaukee WI, USA</i> | 5 |
| Maximum a posteriori reconstruction of CT images using pixel-based latent variable of tissue types | 9 |
| Nakada K, Taguchi K, Fung G S K, Amaya K <i>Tokyo Institute of Technology, Tokyo, Japan; Johns Hopkins University, MD, USA</i> | 13 |
| A generalized vectorial total-variation for spectral CT reconstruction | 17 |
| Rigie D S, La Riviere P J <i>The University of Chicago, Chicago IL, USA</i> | 21 |
| Statistical image reconstruction for metal artifact correction using kV and selective MV imaging | 25 |
| Wu M, Constantin D, Star-Lack J, Fahrig R <i>Stanford University, Stanford, CA, USA; Varian Medical Systems, Inc. Palo Alto, CA, USA</i> | 29 |

Session M2: Dose and image quality

Moderated by Das M (University of Houston) and Stierstorfer K (Siemens Healthcare Sector)

| | |
|--|----|
| Dose reconstruction for real-time patient-specific dose estimation in CT | 17 |
| De Man B, FitzGerald P, Jin Y, Yin Z, Edic P M, Yao Y, Tian X, Samei E <i>GE Global Research, Niskayuna, NY, USA; GE Global Research, Shanghai, China; Duke University, Durham, NC, USA</i> | 21 |
| CT protocol optimization at the dawn of iterative reconstruction: challenges and solutions | 25 |
| Li K, Tang J, Chen G H <i>University of Wisconsin-Madison, WI, USA; GE Healthcare, Waukesha, WI, USA</i> | 29 |
| Application of task-based measures of image quality to evaluation of image reconstruction methods in X-ray CT | 33 |
| Xu J, Elshahaby F, Fuld M K, Fung G S K, Tsui B M W <i>Johns Hopkins University, MD, USA; Siemens Medical Solutions, Inc., Malvern, PA, USA</i> | 37 |
| Mixed confidence estimation for iterative CT reconstruction | 44 |
| Perlmutter D S, Kim S M, Kinahan P E, Alessio A M <i>University of Washington, Seattle, WA, USA</i> | 48 |

Session M3A: Premium posters – Image quality evaluation and optimization

Moderated by Gilat-Schmidt T (Marquette University) and Pack J D (GE Global Research)

| | |
|---|----|
| Vessel overlap sparsity index – A predictive metric for 3D+T accuracy | 33 |
| Royalty K, Szczykutowicz T, Rohkohl C, Kowarschik M <i>Siemens Medical Solutions USA, Inc.; University of Wisconsin, Madison, WI, USA; Siemens AG, Healthcare Sector, Forchheim, Germany</i> | 37 |
| Noise-weighted spatial domain FBP algorithm | 44 |
| Zeng G L <i>Weber State University, Ogden, UT, USA; University of Utah, UT, USA</i> | 48 |
| A new redundancy weighting scheme for non-stationary data | 52 |
| Taguchi K, Cammin J <i>Johns Hopkins University, MD, USA</i> | 56 |
| Construction of an atlas of filter configurations for fluence field modulated CT | 60 |
| Szczykutowicz T P, Mistretta C A <i>University of Wisconsin-Madison, WI, USA</i> | 64 |

| | |
|---|----|
| Feasibility study on ultra-low dose 3D scout of organ based CT scan planning | 52 |
| Yin Z, Yao Y, Montillo A, Edic P M, De Man B <i>GE Global Research, Niskayuna, NY, USA; GE Global Research, Shanghai, China</i> | |
| Task-based comparison of linear forward projection models in iterative CT reconstruction | 56 |
| Schmitt K, Schoendube H, Stierstorfer K, Hornegger J, Noo F <i>Siemens AG, Healthcare Sector, Germany; University of Erlangen-Nuremberg, Erlangen, Germany; University of Utah, UT, USA</i> | |
| Clinical data evaluation of C-arm-based motion compensated coronary artery reconstruction | 60 |
| Schwemmer C, Lauritsch G, Kleinfeld A, Rohkohl C, Müller K, Hornegger J <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany; Siemens AG, Healthcare Sector, Forchheim, Germany</i> | |
| Parameter determination for optimization-based image reconstruction in cone-beam CT for image-guided radiation therapy | 64 |
| Han X, Pearson E, Sidky E Y, Pelizzari C A, Pan X <i>The University of Chicago, IL, USA</i> | |
| Validation of motion artifact metric optimization reconstruction (MAM) | 68 |
| Bruder H, Fung G S K, Rohkohl C, Allmendinger T, Stierstofer K <i>Siemens Healthcare Sector, Forchheim, Germany; John Hopkins University, MD, USA</i> | |

Session M3B: Premium posters – Spectral CT imaging
Moderated by Gilat-Schmidt T (Marquette University) and Pack J D (GE Global Research)

| | |
|---|----|
| Experimental investigation of hybrid region-of-interest spectral CT imaging with a photon-counting detector | 71 |
| Gilat-Schmidt T, Zimmerman K C <i>Marquette University, Milwaukee, WI, USA</i> | |
| Dual-energy-based beam hardening correction in digital volume tomography (DVT) | 75 |
| Schueller S, Stannigel K, Huelsbusch M, Sawall S, Ulrici J, Hell E, Kachelrieß M <i>German Cancer Research Center (DKFZ), Heidelberg, Germany; Institute of Medical Physics, Friedrich-Alexander-University (FAU) Erlangen-Nuremberg, Erlangen, Germany; Sirona Dental Systems GmbH, Bensheim, Germany</i> | |
| Dictionary learning and low rank based multi-energy CT reconstruction | 79 |
| Zhang Y, Yu H, Mou X, Wang G <i>Xi'an Jiaotong University, Xi'an, Shaanxi, China; Beijing Center for Mathematics and Information Interdisciplinary Sciences, Beijing, China; Wake Forest University Health Sciences, Winston-Salem, NC, USA ; Rensselaer Polytechnic Institute, Troy, NY, USA</i> | |
| CNR analysis of dual energy technologies | 83 |
| Jin Y, Gao H, Pack J D, Wiedmann U, De Man B <i>GE Global Research Center, Niskayuna, NY, USA; GE Healthcare, Waukesha, WI, USA</i> | |
| Spectrum binning approach for multi-material beam hardening correction (MMBHC) in CT | 87 |
| Yang Q, Wu M, Maass N, Maier A K, Hornegger J, Fahrig R <i>Friedrich-Alexander-University Erlangen-Nuremberg, Germany; Stanford University, CA, USA; Siemens AG, Healthcare Sector, Erlangen, Germany</i> | |
| Guided noise reduction for spectral CT with energy-selective photon counting detectors | 91 |
| Manhart M, Fahrig R, Hornegger J, Doerfler A, Maier A <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; Universitätsklinikum Erlangen, Erlangen, Germany; Stanford University, CA, USA</i> | |

Session M4: Model-based Iterative CT Reconstruction
Moderated by Fessler J A (University of Michigan) and Taguchi K (Johns Hopkins University)

| | |
|---|-----|
| Modified noise modeling for robust statistical reconstructions Bergner F, Brendel B, Bippus R, Muenzel D, Noel P B, Koehler T <i>Philips Technologie GmbH, Innovative Technologies, Research Laboratories, Hamburg, Germany; Technische Universitaet Muenchen, Munich, Germany</i> | 95 |
| Improved statistical models in iterative CT reconstruction for PET attenuation correction Kim S M, Alessio A M, Perlmutter D S, Thibault J-B, De Man B, Kinahan P E <i>University of Washington, Seattle, WA, USA; GE Healthcare, Waukesha, WI, USA; GE Global Research Center, Niskayuna, NY, USA</i> | 99 |
| Optimized momentum steps for accelerating X-ray CT ordered subsets image reconstruction Kim D, Fessler J A <i>University of Michigan, Ann Arbor, MI, USA</i> | 103 |
| Adaptive sparsifying transforms for iterative tomographic reconstruction Pfister L, Bresler Y <i>University of Illinois, Urbana Champaign, IL, USA</i> | 107 |
| Integration of component knowledge in penalized-likelihood reconstruction with morphological and spectral uncertainties Stayman J W, Tilley S II, Siewerdsen J H <i>Johns Hopkins University, Baltimore, MD, USA</i> | 111 |

Session T1: Homeland Security applications
Moderated by Crawford C (Csuptwo, LLC) and Martz H (Lawrence Livermore National Laboratory)

| | |
|--|-----|
| Explosive detection in aviation applications using CT Parker L <i>Department of Homeland Security, USA</i> | 116 |
| Threat liquid identification in hand-held baggage Faby S, Brehm M, Knaup M, Powell K, Ayoub M, Cantwell B, Radley I, Iovea M, Kachelrieß M <i>German Cancer Research Center (DKFZ), Heidelberg, Germany; Kromek Ltd, Sedgefield, Co Durham, United Kingdom; ACCENT PRO 2000 s.r.l. (AP2K), Bucharest, Romania</i> | 117 |
| Algorithmic improvements to SIRT with application to X-Ray CT of luggage Gregor J <i>University of Tennessee, Knoxville, TN, USA</i> | 121 |
| Sinogram sparsified metal artifact reduction technology (SSMART) Do S, Karl W C <i>Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA; Boston University, MA, USA</i> | 125 |
| Sinogram restoration for security screening CT applications Vargas P, La Riviere P <i>University of Chicago, IL, USA</i> | 129 |
| Artifact reduction in dual-energy CT reconstruction for security applications Martin L, Karl W C, Ishwar P <i>Boston University, Boston, MA, USA</i> | 133 |
| Simultaneous segmentation and reconstruction for dual-energy CT: experimental results Tracey B H, Miller E L <i>Tufts University, Medford MA, USA</i> | 137 |

| | |
|---|-----|
| Compressed sensing as a tool for scanning very large objects with high energy X-ray computed tomography | 141 |
| Schoen T, Firsching M, Reims N, Sukowski F, Dittmann J <i>Fraunhofer Institute for Integrated Circuits IIS, Fuerth, Germany; Julius-Maximilians-University, Wuerzburg, Germany</i> | |
| Investigation of simulation software for explosive-detection CT imaging | 145 |
| Gilat-Schmidt T <i>Marquette University, Milwaukee, WI, USA</i> | |
| Efficient and accurate correction of beam hardening artifacts | 149 |
| Champlay K, Bremer T <i>Lawrence Livermore National Laboratory, Livermore, CA, USA</i> | |

Session T2: Invited talks

Moderated by McCollough C (Mayo Clinic) and Tsui B (Johns Hopkins University)

Radiation dose in x-ray computed tomography

McNitt-Gray M

University of California Los Angeles, CA, USA

Model observers: perspective from nuclear medicine

Gifford H

University of Houston, TX, USA

Breast CT imaging: state-of-the-art

Vedantham S

UMass Medical School, MA, USA

Session T3: Classical posters -- New directions

Human and model observers performance in low contrast detection tasks with CT phantom images acquired at different dose levels

153

Hernandez-Giron I, Geleijns J, Calzado A, Joemai R M S, Veldkamp W J H

Universitat Rovira i Virgili, Reus, Spain; Universidad Complutense de Madrid, Spain; Leiden University Medical Center, The Netherlands

X-ray tube potential modulation in spectral CT

157

Li X, Wang X, Zou Y

Johns Hopkins University, Baltimore, MD, USA; Toshiba Medical Research Institute USA, Vernon Hills, IL, USA

Motion-compensated cardiac CT with extended projection data range

161

Cammin J, Tang Q, Taguchi K

Johns Hopkins University, MD, USA; Toshiba Medical Research Institute USA, Vernon Hills, IL, USA

Textureization: a generalized image quality comparison method

165

Do S, Pourjabbar S, Khawaja R, Padole A, Singh S, Kalra M

Massachusetts General Hospital and Harvard Medical School, Boston, MA, USA

Motion compensated backprojection versus backproject-then-warp for motion compensated reconstruction

169

Brendel B, Bippus R, Kabus S, Grass M

Philips Technologie GmbH, Innovative Technologies, Research Laboratories, Hamburg, Germany

Optimal kVp selection for contrast CT imaging based on a projection-domain method

173

Rui X, Jin Y, Fitzgerald P F, Alessio A, Kinahan P, De Man B

GE Global Research Center, Niskayuna, NY, USA; University of Washington, Seattle, WA, USA

A cone-beam reconstruction algorithm for dose-minimized short scan and super short scan

178

Xia Y, Dennerlein F, Bauer S, Berger M, Hornegger J, Maier A

Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany; Siemens AG, Healthcare Sector, Germany

| | |
|---|-----|
| Fast and accurate stratification of tomographic scans for motion artifacts | 182 |
| Ho H, Nett B E, Pack J D | |
| <i>GE Healthcare, WI, USA; GE Global Research Center, Niskayuna, NY, USA</i> | |
| Constrained TV-minimization image reconstruction for dynamic micro-CT data with reduced angular sampling | 186 |
| Chen B, Liu X, Zhang Z, Davis A, Han X, Sidky E Y, Pan X | |
| <i>The University of Chicago, Chicago, IL, USA; Bruker microCT, Kontich, Belgium</i> | |
| A modified 4D ROOSTER method using the Chambolle-Pock algorithm | 191 |
| Mory C, Jacques L | |
| <i>Universite catholique de Louvain, Louvain-la-Neuve, Belgium; Universite de Lyon, France</i> | |
| Regularised GMRES-type methods for X-ray computed tomography | 194 |
| Coban S B, Lionheart W R B | |
| <i>The University of Manchester, Manchester, UK</i> | |
| Performance evaluation of OS-SPS and CG for differential phase-contrast X-ray tomography | 198 |
| Fehringer A, Brendel B, Hahn D, Noël P B, Pfeiffer F, Koehler T | |
| <i>Technische Universität München, Munich, Germany; Philips Technologie GmbH, Innovative Technologies, Hamburg, Germany</i> | |
| Estimation of missing fan-beam projections using frequency consistency conditions | 203 |
| Pohlmann M, Berger M, Maier A, Hornegger J, Fahrig R | |
| <i>Stanford University, CA, USA; Friedrich Alexander Universitaet Erlangen-Nuremberg, Erlangen, Germany</i> | |
| Experimental investigation of multi-energy CT material decomposition using artificial neural networks | 208 |
| Zimmerman K C, Gilat-Schmidt T | |
| <i>Marquette University, Milwaukee, WI, USA</i> | |
| A simple and efficient super-short-scan algorithm of fan-beam reconstruction for multiple circular trajectories: solution towards the truncated data | 212 |
| Chen L, Rodet T, Gac N | |
| <i>Universite Paris-Sud-CNRS-Supelec, France; Ecole Normale Superieur de Cachan, France</i> | |
| Sampling analysis of a dual source and dual detector CT system | 216 |
| Cao G, Hsieh J | |
| <i>GE Healthcare, Waukesha, WI, USA</i> | |
| Quantitative uniformity of iodinated contrast across the Z-coverage of large cone-angle CT | 220 |
| Gao H, Cohen A, Imai Y | |
| <i>GE Healthcare, Waukesha, WI, USA</i> | |
| Quantifying Hotelling observer performance for detection of small signals in CT images produced by linear reconstruction algorithms | 224 |
| Sanchez A A, Sidky A Y, Pan X | |
| <i>The University of Chicago, IL, USA</i> | |
| Optimization-based reconstruction exploiting spectral information in CT | 228 |
| Pan X, Chen B, Zhang Z, Pearson E, Sidky E Y, Han X | |
| <i>The University of Chicago, IL, USA</i> | |
| Tomosynthesis image quality assessment based on micro-CT | 233 |
| Cordes A, Levakhina Y M, Buzug T M | |
| <i>Universitaet zu Luebeck, Luebeck, Germany</i> | |
| Effect of reconstruction method on optimal acquisition parameters for lesion detection-localization in digital breast tomosynthesis | 237 |
| Liang Z, Gifford H C, Das M | |
| <i>University of Houston, TX, USA</i> | |
| Optimization of prior parameter for noise control in iterative computed tomography reconstruction | 241 |
| Yamakawa K, Kojima S | |
| <i>Hitachi Central Research Laboratory, Tokyo, Japan</i> | |

| | |
|---|-----|
| Synchrotron-based microtomography: exploiting tunable, monochromatic, parallel X-rays for non-destructive materials characterization | 245 |
| Willey T M, van Buuren T, Lauderbach L, Gagliardi F, Overturf G | |
| <i>Lawrence Livermore National Laboratory, USA</i> | |
| 2D filtered backprojection for fan-beam CT with independent rotations of the source and the detector | 249 |
| Rit S, Clackdoyle R | |
| <i>Universite de Lyon, France; Laboratoire Hubert Curien, CNRS, France; Universite Jean Monnet, Saint Etienne, France</i> | |
| A GPU-accelerated Katsevich algorithm with CUDA for fast, scalable, helical cone-beam CT | 253 |
| Ward W C, Lattimore B M, Hunter J F | |
| <i>Los Alamos National Laboratory, Los Alamos, NM, USA</i> | |
| General thresholding representation for the L_p regularization and its application in computed tomography | 257 |
| Miao C, Yu H | |
| <i>Wake Forest University Health Sciences, Winston-Salem, NC, USA</i> | |
| GPU-based implementation for interior tomography | 261 |
| Liu R, Yu H | |
| <i>Wake Forest University Health Sciences, Winston-Salem, NC, USA</i> | |
| Solid lung nodule volumetry: effects of dose reduction and reconstruction algorithms | 265 |
| Young S, McNitt-Gray M F | |
| <i>University of California Los Angeles, CA, USA</i> | |
| Considerations on an advanced adaptive filter | 270 |
| Schoendube H, Raupach R, Stierstorfer K | |
| <i>Siemens AG, Healthcare Sector, Forchheim, Germany</i> | |
| Improved trajectories in C-Arm computed tomography for non-circular fields of view | 274 |
| Herbst M, Schebesch F, Berger M, Fahrig R, Hornegger J, Maier A | |
| <i>Friedrich-Alexander-Universitaet Erlangen-Nuremberg, Erlangen, Germany; Stanford University, Stanford, CA, USA</i> | |
| Reduction of dose by focusing the X-ray beam to a specific region of interest: Monte Carlo assessment | 279 |
| Oktay M B, Noo F | |
| <i>University of Utah, UT, USA</i> | |

Session T4: Phase contrast CT & Few-view CT
 Moderated by De Man B (GE Global Research) and Tang X (Emory University)

| | |
|--|-----|
| Grating based differential phase contrast CT imaging without mechanical phase stepping | 283 |
| Ge Y, Li K, Garrett J, Chen G-H | |
| <i>University of Wisconsin-Madison, Madison, WI, USA</i> | |
| X-ray phase-contrast computed tomography in helical mode without phase stepping | 287 |
| Marschner M, Willner M, Herzen J, Noel P B, Pfeiffer F | |
| <i>Technische Universitaet Muenchen, Garching, Germany; Institute of Materials Research, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany</i> | |
| Fast splitting-based ordered-subsets X-ray CT image reconstruction | 291 |
| Nien H, Fessler J A | |
| <i>University of Michigan, Ann Arbor, MI, USA</i> | |
| Tomographic image reconstruction from continuous projections | 295 |
| Cant J, Palenstijn W J, Behiels G, Sijbers J | |
| <i>University of Antwerp, Belgium; Agfa Healthcare NV, Belgium</i> | |
| Preliminary evaluation of dental cone-beam CT image from reduced projection data by constrained-TV-minimization | 299 |
| Zhang Z, Han X, Kusnoto B, Sidky E Y, Pan X | |
| <i>The University of Chicago, IL, USA; The University of Illinois at Chicago, IL, USA</i> | |

Session W1: Advanced cone-beam imaging techniques and algorithms
 Moderated by Chen G-H (University of Wisconsin-Madison) and Sidky E Y (University of Chicago)

| | |
|--|-----|
| Old ideas new again: a system concept for fast CT using semi-conventional approaches | 303 |
| Besson G M | |
| <i>ForeVision Technologies Corporation, USA</i> | |
| Mitigating cone-beam artifacts via shift-variant data usage for large cone-angle scans | 307 |
| Pack J D, Zeng K, Budde A, Yin Z, De Man B | |
| <i>GE Global Research Center, Niskayuna, NY, USA; GE Healthcare, Waukesha, WI, USA</i> | |
| Efficient and exact C-arm cone-beam imaging for axially extended field-of-view using the ellipse-line-ellipse trajectory | 311 |
| Yu Z, Lauritsch G, Hornegger J, Noo F | |
| <i>University of Utah, Salt Lake City, USA; Siemens AG, Healthcare Sector, Forchheim, Germany; University of Erlangen-Nuremberg, Erlangen, Germany</i> | |
| New inversion formula for the X-ray transform and its application to CT reconstruction | 315 |
| Oeckl S | |
| <i>Fraunhofer-Entwicklungsamt Roentgentechnik EZRT, Fuerth, Germany</i> | |

Session W2: Data consistency conditions and applications
 Moderated by Xu J (Johns Hopkins University) and Yu Z (Mayo Clinic)

| | |
|--|-----|
| Data consistency conditions for 2D truncated parallel projections | 319 |
| Clackdoyle R, Desbat L | |
| <i>Laboratoire Hubert Curien, CNRS, Saint Etienne, France; TIMC-IMAG laboratory, CNRS UMR, Grenoble, France; Joseph Fourier University, Grenoble, France</i> | |
| Fanbeam data consistency conditions for applications to motion detection | 324 |
| Clackdoyle R, Rit S, Hoskovec J, Desbat L | |
| <i>Laboratoire Hubert Curien, CNRS, Saint Etienne, France; TIMC-IMAG laboratory, CNRS UMR, Grenoble, France; Joseph Fourier University, Grenoble, France; CREATIS laboratory, CNRS and INSERM, Lyon, France; Université Jean Monnet, Saint Etienne, France</i> | |
| Motion compensated fan-beam CT by enforcing Fourier properties of the sinogram | 329 |
| Berger M, Maier A, Xia Y, Hornegger J, Fahrig R | |
| <i>Stanford University, CA, USA; Friedrich-Alexander-Universitaet Erlangen-Nuremberg, Erlangen, Germany</i> | |
| Redundancies in X-ray images due to the epipolar geometry for transmission imaging | 333 |
| Aichert A, Maass N, Deuerling-Zheng Y, Berger M, Manhart M, Hornegger J, Maier A K, Doerfler A | |
| <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany; Siemens AG, Healthcare Sector, Erlangen and Forchheim, Germany; Universitätsklinikum Erlangen, Germany</i> | |
| Geometrical jitter correction in computed tomography | 338 |
| Maass N, Dennerlein F, Aichert A, Maier A | |
| <i>Siemens AG, Healthcare Sector, Erlangen, Germany; Friedrich-Alexander-University Erlangen-Nuremberg, Germany</i> | |

Session W3A: Premium poster – Model-based iterative CT reconstruction
 Moderated by Szczytkowicz T (University of Wisconsin-Madison) and Yu Z (Toshiba Medical Research Institute, USA)

| | |
|--|-----|
| An efficient technique for multi-phase model based iterative reconstruction | 343 |
| Xu S, Pal D, Thibault J-B | |
| <i>Southern Illinois University, Carbondale, IL, USA; GE Healthcare, Waukesha, WI, USA</i> | |

| | |
|---|-----|
| Multiscale interior tomography using 1D generalized total variation | 347 |
| Lee M, Ward J P, Unser M, Ye J C | |
| <i>KAIST, Korea; EPFL, Switzerland</i> | |
| Application of incremental algorithms to CT image reconstruction for sparse-view, noisy data | 351 |
| Rose S, Andersen M S, Sidky E Y, Pan X | |
| <i>The University of Chicago, IL, USA; Technical University of Denmark, Denmark</i> | |
| GPU accelerated structure-exploiting matched forward and back projection for algebraic iterative cone beam CT reconstruction | 355 |
| Thompson W M, Lionheart W R B | |
| <i>University of Manchester, UK</i> | |
| Duality-based projection-domain tomography solver for splitting-based X-ray CT reconstruction | 359 |
| McGaffin M G, Fessler J A | |
| <i>University of Michigan, Ann Arbor, MI, USA</i> | |
| Iterative CT reconstruction using models of source and detector blur and correlated noise | 363 |
| Tilley S II, Siewerdsen J H, Stayman J W | |
| <i>Johns Hopkins University, Baltimore, MD, USA</i> | |
| CT reconstruction of surfaces from binary objects | 368 |
| Sawall S, Kuntz J, Maier J, Flach B, Schueller S, Kachelrieß M | |
| <i>German Cancer Research Center (DKFZ), Heidelberg, Germany</i> | |

Session W3B: Premium poster – Data simulation & corrections for physical effects
Moderated by Szczykutowicz T (University of Wisconsin-Madison) and Yu Z (Toshiba Medical Research Institute, USA)

| | |
|---|-----|
| Statistical framework for synthetic object addition to CT projections | 372 |
| Zabic S, Brown K M, Eck B | |
| <i>Philips Healthcare, Cleveland, OH, USA; Case Western Reserve University, Cleveland, OH, USA</i> | |
| Development of a cardiac CT simulation platform: an integration of 4D anthropomorphic phantom with stent models and an accurate CT projector | 376 |
| Fung G S K, Stierstorfer K, Taguchi K, Segars W P, Bruder H, Fuld M, Flohr T G, Tsui B M W | |
| <i>Johns Hopkins University, Baltimore, MD, USA; Siemens Healthcare, Forchheim, Germany; Duke University, Durham, NC, USA.</i> | |
| Axial cone beam BPF/DBPF reconstruction with 3D weighting and butterfly filtering | 380 |
| Tang S, Wang W, Tang X | |
| <i>Xi'an University of Posts and Telecommunications, Xi'an, Shaanxi, China; Emory University, Atlanta, GA, USA</i> | |
| Reduction of cone artifacts in CT with incomplete source trajectories | 384 |
| Sunnegårdh J, Schoendube H, Flohr T | |
| <i>Siemens Healthcare, Forchheim, Germany</i> | |
| Bilateral filtering for X-ray phase-contrast imaging | 388 |
| Allner S, Koehler T, Fehringer A, Willner M, Pfeiffer F, Noël P B | |
| <i>Technische Universität München, Munich, Germany; Philips Technologie GmbH, Innovative Technologies, Hamburg, Germany</i> | |
| Metal artifact reduction using l1 and non-local penalties with iterative sinogram correction | 393 |
| Kim K, Ye J C, El Fakhri G, Li Q | |
| <i>Massachusetts General Hospital and Harvard Medical School, MA, USA; Korea Advanced Institute of Science and Technology, Daejeon, Korea</i> | |

| | |
|--|-----|
| Scatter deconvolution in X-ray cone-beam CT using data consistency Kim C, Park M, Sung Y, Lee J H, Choi J, Cho S <i>Korea Advanced Institute of Science and Technology, Daejeon, Korea; Samsung Advanced Institute of Technology, Suwon, Korea</i> | 397 |
| A sparse Monte Carlo method for high speed, high accuracy scatter correction for soft-tissue imaging in cone-beam CT Zbijewski W, Sisniega A, Stayman J W, Yorkston J, Aygun N, Koliatsos V, Siewersdson J H <i>Johns Hopkins University, Baltimore, MD, USA; Carestream Health, Rochester, NY, USA</i> | 401 |

| | |
|--|-----|
| Session W4: X-ray cone-beam imaging in interventional radiology Moderated by Kachelriess M (DKFZ) and Stayman J W (Johns Hopkins University) | |
| Deformable 3D–2D registration for CT and its application to low dose tomographic fluoroscopy Flach B, Kuntz J, Brehm M, Kueres R, Bartling S, Kachelrieß M <i>German Cancer Research Center (DKFZ), Heidelberg, Germany; University of Erlangen–Nuremberg, Erlangen, Germany; University Medical Center Mannheim, Mannheim, Germany</i> | 405 |
| Nesterov's method for accelerated penalized-likelihood statistical reconstruction for C-arm cone-beam CT Wang A S, Stayman J W, Otake Y, Kleinszig G, Vogt S, Siewersdson J H <i>Johns Hopkins University, Baltimore, MD, USA; Siemens Healthcare, Erlangen, Germany</i> | 409 |
| Patient-bounded extrapolation for 3D region of interest reconstruction in C-arm CT Xia Y, Bauer S, Maier A, Berger M, Hornegger J <i>Friedrich-Alexander-University Erlangen-Nuremberg, Erlangen, Germany; Siemens AG, Healthcare Sector, Germany</i> | 414 |
| Catheter artifact reduction (CAR) in dynamic cardiac chamber imaging with interventional C-arm CT Müller K, Lauritsch G, Schwemmer C, Maier A K, Taubmann O, Abt B, Köhler H, Nöttling A, Hornegger J, Fahrig R <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Erlangen, Germany; Siemens AG, Healthcare Sector, Forchheim, Germany; Herz- und Kreislaufzentrum, Rotenburg an der Fulda, Germany; Stanford University, CA, USA</i> | 418 |