Computational Imaging XII

Conference Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

Tuesday 4 February

Location: Continental Ballroom 5 . . . . . .**8:30 am to 9:50 am**

Plenary Session and Society Award Presentations

8:30 am: **Using fMRI To Reverse Engineer the Human Visual System** *(Plenary)*, Jack L. Gallant, Univ. of California, Berkeley (United States) . . . . [9011-301]

Location: Continental Ballroom 4 . . . . . **5:30 pm to 7:30 pm**

Symposium Demonstration Session

A symposium-wide demonstration session will be open to attendees 5:30 to 7:30 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.

Wednesday 5 February

Location: Continental Ballroom 5 . . . . . .**8:30 am to 9:50 am**

Plenary Session and Conference Award Presentations

8:30 am: **Integrated Imaging: Creating Images from the Tight Integration of Algorithms, Computation, and Sensors** *(Plenary)*, Charles A. Bouman, Purdue Univ. (United States) . . . . [9011-300]

Interactive Paper Session-Wednesday

Interactive papers will be placed on display after 8:30 am on Wednesday. An interactive paper session, with authors present at their papers, will be held Wednesday morning, 9:50 to 11:10 am. Refreshments will be served.

Location: Continental Ballroom and Golden Gate Foyers . . . .**9:50 am to 11:10 am**

Medical MR image compressed sensing reconstruction based on wavelet and l_1 norm optimization, Xiaoming Huang, Beijing Jiaotong Univ. (China); Ivan Jambor, Harri Merisaari, Marko Pesola, Chunlei Han, H. J. Aronen, Univ. of Turku (Finland); Gangrong Qu, Beijing Jiaotong Univ. (China) . . . . [9020-31]

Texture mapping 3D models of indoor environments with noisy camera poses, Peter Cheng, Michael Anderson, Stewart He, Avideh Zakhor, Univ. of California, Berkeley (United States) . . . . [9020-32]

Spatial adaptive blending method for robust ultrasound image deconvolution, Sung-chan Park, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . [9020-33]

Reconstruction of compressively sampled ray space by using DCT basis and statistically-weighted L1 norm optimization, Qiang Yao, Keita Takahashi, Toshiaki Fujii, Nagoya Univ. (Japan) . . . . [9020-34]

Image matching in Bayer raw domain to de-noise low-light still images, optimized for real-time implementation, Ilya V. Romanenko, Apical (United Kingdom); Eran Edirisinghe, Loughborough Univ. (United Kingdom) . . . . [9020-35]

Real-time focal stack compositing for handheld mobile cameras, Mashhour Solh, Texas Instruments Inc. (United States) . . . . [9020-36]

Image deblurring using the direction dependence of camera resolution, Yukio Hirai, Hiroyasu Yoshikawa, Masayoshi Shimizu, Fujitsu Labs., Ltd. (Japan) . . . . [9020-37]

Illumination modeling and optimization for indoor video surveillance environment, Krishna Reddy Konda, Nicola Conci, Univ. degli Studi di Trento (Italy) . . . . [9020-38]

Nonlinear and non-Gaussian Bayesian-based handwriting beautification, Cao Shi, Jianguo Xiao, Wenhua Jia, Canhui Xu, Peking Univ. (China) . . . . [9020-39]

Multi-exposure image fusion with compensation for multi-dimensional camera shake and foreground object movement, Eran A. Edirisinghe, Manal Al-Rawahi, Sara Saravi, Loughborough Univ. (United Kingdom) . . . . [9020-40]

LCAV-31: a dataset for light field object recognition, Alireza Ghasemi, Nelly J. Afonso, Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . [9020-41]

Scale-invariant representation of light field images for object recognition and tracking, Alireza Ghasemi, Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . [9020-42]

Image indexing based on a circularity features, Ana M. Herrera-Navarro, Univ. Autonoma de Queretaro (Mexico); Hugo Jiménez-Hernández, Ctr. de Ingenieria y Desarrollo Industrial (Mexico); Ivan Terol-Villalobos, CIDETEQ (Mexico) . . . . [9020-43]

Comparative analysis of the speed performance of texture analysis algorithms on a graphic processing unit (GPU), Jennifer C. Triana, Sergio A. Orjuela Vargas, Univ. Antonio Nariño (Colombia); Wilfried Philips, Univ. Gent (Belgium) . . . . [9020-44]

Session 1

Location: Plaza B . . . . **Wed 11:10 am to 12:10 pm**

Computational Imaging for Consumer Electronics

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

11:10 am: **Video colorization based on optical flow and edge-oriented color propagation**, Mayu Otani, Nara Institute of Science and Technology (Japan); Hirohisa Hioki, Kyoto Univ. (Japan) . . . . [9020-1]

11:30 am: **Image enhancement with blurred and noisy image pairs using dual edge-preserving filtering technique**, Yuushi Toyoda, Hiroyasu Yoshikawa, Masayoshi Shimizu, Fujitsu Labs., Ltd. (Japan) . . . . [9020-3]

11:50 am: **Computational efficiency improvements for image colorization**, Chao Yu, Gaurav Sharma, Univ. of Rochester (United States); Hussein Aly, Military Technical College (Egypt) . . . . [9020-4]

Lunch Break . . . . .Wed 12:10 pm to 2:00 pm

Session 2

Location: Plaza B . . . . **Wed 2:00 pm to 3:40 pm**

Inverse Problems

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

2:00 pm: **Architectures and algorithms for x-ray diffraction imaging**, David A. Castañón, Boston Univ (United States) . . . . [9020-5]

2:20 pm: **Joint metal artifact reduction and material discrimination in x-ray CT using a learning-based graph-cut method**, Limor Martin, Ahmet Tuysuzoglu, Prakash Ishwar, William C. Karl, Boston Univ. (United States) . . . . [9020-6]

2:40 pm: **Accurate estimation of noise correlations in a CT image**, Frédéric Noo, Marta Heilbrun, The Univ. of Utah (United States) . . [9020-7]

3:00 pm: **Linear discriminant analysis (LDA) for rapid deconvolution of photon counting measurements by digital filtering**, Shane Z. Sullivan, Ryan D. Muir, Garth J. Simpson, Purdue Univ. (United States) . . . [9020-8]

3:20 pm: **Magnified neutron radiography with coded sources**, Philip R. Bingham, Hector J. Santos-Villalobos, Nickolay V. Lavrik, Oak Ridge National Lab. (United States); Jens Gregor, The Univ. of Tennessee (United States); Hassina Bilheux, Oak Ridge National Lab. (United States) [9020-9]

Coffee Break . . . . .Wed 3:40 pm to 4:00 pm

Session 3

Location: Plaza B . . . .**Wed 4:00 pm to 5:20 pm**

Modeling and Analysis of Multidimensional Data

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

4:00 pm: **A super-resolution algorithm for enhancement of flash lidar data: flight test results**, Alexander Bulyshev, Analytical Mechanics Associates, Inc. (United States); Farzin Amzajerdian, Vincent E. Roback, Robert A. Reisse, NASA Langley Research Ctr. (United States). . [9020-10]

4:20 pm: **Automatic image assessment from facial attributes**, Ray Ptucha, David Kloosterman, Brian Mittelstaedt, Alexander Loui, Eastman Kodak Co. (United States). . . . . [9020-11]

4:40 pm: **Closely spaced object discrimination computation using quantum annealing model**, John J. Tran, Information Sciences Institute (United States); Robert F. Lucas, The Univ. of Southern California (United States); Kevin J. Scully, Darren L. Semmen, The Aerospace Corp. (United States) . . . . [9020-12]

5:00 pm: **3D quantitative microwave imaging from sparse measured data with Huber regularization**, Funing Bai, Aleksandra Pizurica, Univ. Gent (Belgium). . . . . [9020-13]

Thursday 6 February

Session 4

Location: Plaza B . . . . **Thu 8:30 am to 10:10 am**

Tomographic Estimation

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

8:30 am: **Novel tensor transform-based method of image reconstruction from limited-angle projection data**, Artyom M. Grigoryan, Nan Du, The Univ. of Texas at San Antonio (United States) . . . . [9020-14]

8:50 am: **Statistical x-ray computed tomography from photon-starved measurements**, Zhiqian Chang, University of Notre Dame (United States); Jean-Baptiste Thibault, GE Healthcare (United States); Ken Sauer, University of Notre Dame (United States); Charles Bouman, Purdue University (United States) . . . . [9020-15]

9:10 am: **Model-based iterative tomographic reconstruction with adaptive sparsifying transforms**, Luke Pfister, Yoram Bresler, Univ. of Illinois at Urbana-Champaign (United States). . . . . [9020-16]

9:30 am: **Structured illumination for compressive x-ray diffraction tomography**, Joel A. Greenberg, Mehadi Hassan, Kalyani Krishnamurthy, David Brady, Duke Univ. (United States). . . . . [9020-17]

9:50 am: **Generalized Huber functions for model-based reconstruction from anomalous data**, Singanallur Venkatakrishnan, Purdue Univ. (United States); Lawrence F. Drummy, Air Force Research Lab. (United States); Marc De Graef, Carnegie Mellon Univ. (United States); Jeff Simmons, Air Force Research Lab. (United States); Charles A. Bouman, Purdue Univ. (United States). . . . . [9020-18]

Coffee Break . . . . .Thu 10:10 am to 10:40 am

Session 5

Location: Plaza B . . . . **Thu 10:40 am to 12:00 pm**

Inverse Problems in Materials and Security

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

10:40 am: **Effects of powder microstructure on CT number estimates**, Jeffrey S. Kallman, Sabrina dePiero, Stephen G. Azevedo, Harry E. Martz, Lawrence Livermore National Lab. (United States). . . . . [9020-19]

11:00 am: **Coded aperture x-ray scatter tomography**, Andrew Holmgren, Kenneth P. MacCabe, Martin P. Tornai, David J. Brady, Duke Univ (United States) . . . . [9020-20]

11:20 am: **Marked point process models for microscope images of materials**, Huixi Zhao, Mary L. Comer, Purdue Univ. (United States) . . . . [9020-21]

11:40 am: **Model-based, one-sided, time-of-flight terahertz image reconstruction**, Stephen M. Schmitt, Jeffrey A. Fessler, Univ. of Michigan (United States); Greg D. Fichter, David A. Zimdars, Picometrix, LLC (United States) . . . . [9020-22]

Lunch Break . . . . Thu 12:00 pm to 2:00 pm

Session 6

Location: Plaza B . . . . **Thu 2:00 pm to 3:00 pm**

Image Enhancement and Denoising

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

2:00 pm: **Resolution enhancement and noise reduction using an array of cameras**, Ibrahim E. Pekkucuksen, Umit Batur, Texas Instruments Inc. (United States). . . . . [9020-23]

2:20 pm: **Fast edge-preserving image denoising via group coordinate descent on the GPU**, Madison G. McGaffin, Jeffrey A. Fessler, Univ. of Michigan (United States) . . . . [9020-24]

2:40 pm: **Signal processing to improve imagery from compressive sensing cameras under unstable illumination**, Donna Hewitt, Justin Fritz, Tyler Weston, James Tidman, Matt Herman, Lenore McMackin, InView Technology Corp. (United States) . . . . [9020-25]

Coffee Break . . . . Thu 3:00 pm to 3:40 pm

Session 7

Location: Plaza B . . . . **Thu 3:40 pm to 5:00 pm**

Light Field Cameras and Algorithms

Session Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ken D. Sauer,** Univ. of Notre Dame (United States)

3:40 pm: **JEI** **Adaptive compressive sensing algorithm for video acquisition using a single-pixel camera**, Imama Noor, Univ. of Memphis (United States). . . . . [9020-27]

4:00 pm: **Light field panorama by a plenoptic camera**, Zhou Xue, Loïc Baboulaz, Paolo Prandoni, Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . [9020-28]

4:20 pm: **Efficient volumetric estimation from plenoptic data**, Paul Anglin, Stanley J. Reeves, Auburn Univ (United States) . . . . [9020-29]

4:40 pm: **Computationally efficient background subtraction in the light field domain**, Alireza Ghasemi, Mahdad Hosseinikamal, Martin Vetterli, Ecole Polytechnique Fédérale de Lausanne (Switzerland) . . . . . . [9020-30]

JEI = Published in *the Journal of Electronic Imaging*