Conference 8657

Tuesday–Thursday 5–7 February 2013 • Proceedings of IS&T/SPIE Vol. 8657

Computational Imaging XI

Conference Chairs: **Charles A. Bouman,** Purdue Univ. (United States); **Ilya Pollak,** Purdue Univ. (United States); **Patrick J. Wolfe,** Harvard Univ. (United States)

Program Committee: **Scott T. Acton,** Univ. of Virginia (United States); **Thomas S. Denney Jr.,** Auburn Univ. (United States); **Minh N. Do,** Univ. of Illinois at Urbana-Champaign (United States); **Peter C. Doerschuk,** Cornell Univ. (United States); **Maya R. Gupta,** Univ. of Washington (United States); **William C. Karl,** Boston Univ. (United States); **Eric L. Miller,** Tufts Univ. (United States); **Joseph A. O'Sullivan,** Washington Univ. in St. Louis (United States); **Zygmunt Pizlo,** Purdue Univ. (United States); **Stanley J. Reeves,** Auburn Univ. (United States); **Jeff P. Simmons,** Air Force Research Lab. (United States); **Yongyi Yang,** Illinois Institute of Technology (United States)

Tuesday 5 February

Room: Grand Peninsula Ballroom D Tue 8:20 to 9:30 am

Plenary Session and Society Award Presentations

8:25 am: **Another Look at Signals and Images**, Sabine Süsstrunk, École Polytechnique Fédérale de Lausanne (Switzerland)

Session 1

Room: Harbour Room A . . . . . Tue 2:00 pm to 3:40 pm

Computational Photography

2:00 pm: **A unifying retinex model based on non-local differential operators**, Dominique Zosso, Giang Tran, Stanley J. Osher, Univ. of California, Los Angeles (United States) . . . . . [8657-1]

2:20 pm: **Subspace methods for computational relighting**, Ha Q. Nguyen, Siying Liu, Minh N. Do, Univ. of Illinois at Urbana-Champaign (United States) . . . . . [8657-2]

2:40 pm: **Bayesian demosaicing using Gaussian scale mixture priors with local adaptivity in the dual tree complex wavelet packet transform domain**, Bart Goossens, Jan Aelterman, Hiep Luong, Aleksandra Pižurica, Wilfried Philips, Univ. Gent (Belgium) . . . . . [8657-3]

3:00 pm: **Demosaicing for RGBZ sensor**, Lilong Shi, Ilia Ovsiannikov, Samsung Semiconductor, Inc. (United States); Dong-Ki Min, Yohwan Noh, SAMSUNG Electronics Semiconductor (Korea, Republic of); Wanghyun Kim, Sunhwa Jung, Joonho Lee, Deokha Shin, Hyekyung Jung, SAMSUNG Electronics Co., Ltd. (Korea, Republic of); Gregory Waligorski, Michelle Wang, Wendy Wang, Samsung Semiconductor, Inc. (United States); Yoondong Park, Chilhee Chung, SAMSUNG Electronics Co., Ltd. (Korea, Republic of) . . . . . [8657-4]

3:20 pm: **Auto zoom crop from face detection and facial features**, Raymond Ptucha, Brian Mittelstaedt, David Rhoda, Eastman Kodak Co. (United States) . . . . . [8657-5]

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

Session 2

Room: Harbour Room A . . . . . Tue 4:00 pm to 4:40 pm

Compressed Sensing and Coded Aperture Imaging

4:00 pm: **Optimal filters for high-speed compressive detection in spectroscopy**, Bradley J. Lucier, Gregery T. Buzzard, Purdue Univ. (United States) . . . . . [8657-6]

4:20 pm: **Neutron imaging with coded sources: new challenges and the implementation of a simultaneous iterative reconstruction technique**, Hector J. Santos-Villalobos, Philip R. Bingham, Oak Ridge National Lab. (United States); Jens Gregor, The Univ. of Tennessee (United States) . . . . . [8657-8]

Room: Grand Peninsula Ballroom A Tue 5:30 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 6 February

Room: Grand Peninsula Ballroom D Wed 8:20 to 9:30 am

Plenary Session and Conference Award Presentations

8:25 am: **A Trillion Photos,** Steven Seitz, Univ. of Washington (United States)

Session 3

Room: Harbour Room A . . . . . Wed 9:50 am to 10:30 am

Physics-Based Microscopic Imaging I

9:50 am: **Physics-based regularization**, Jeffrey P. Simmons, Air Force Research Lab. (United States) . . . . . [8657-10]

10:10 am: **Reconstruction of bright field STEM with Bragg diffraction correction**, Charles A. Bouman, Purdue Univ. (United States) . . [8657-11]

Coffee Break . . . . . Wed 10:30 am to 10:45 am

Room: Grand Peninsula Ballroom E . . . . . Wed 10:45 to 11:30 am

Keynote Session I

Please note the room change for this session.

10:45 am: **Petapixel photography and the limits of camera information capacity** *(Keynote Presentation)*, David J. Brady, Duke Univ. (United States) . . . . . [8657-35]

Session 4

Room: Harbour Room A . . . . . Wed 11:50 am to 12:30 pm

Physics-Based Microscopic Imaging II

11:50 am: **Sparse imaging for fast electron microscopy**, Hyrum S. Anderson, Jovana Helms, Brandon Rohrer, Jason Wheeler, Kurt W. Larson, Sandia National Labs. (United States) . . . . . [8657-12]

12:10 pm: **Building and enforcing shape priors for segmentation of alloy micrographs**, Landis M. Huffman, The MITRE Corp. (United States); Jeffrey P. Simmons, Air Force Research Lab. (United States); Marc De Graef, Carnegie Mellon Univ. (United States); Ilya Pollak, Purdue Univ. (United States) . . . . . [8657-13]

Lunch Break . . . . . Wed 12:30 pm to 2:00 pm

Session 5

Room: Harbour Room A . . . . . .Wed 2:00 pm to 3:40 pm

Physics-Based Microscopic Imaging III

2:00 pm: **Real-time dynamic range and signal to noise enhancement in beam-scanning microscopy by integration of sensor characteristics, data acquisition hardware, and statistical methods**, Garth J. Simpson, Purdue Univ. (United States) . . . . . [8657-14]

2:20 pm: **Multi-modal electron tomography**, Lawrence F. Drummy, UES, Inc. (United States) . . . . . [8657-15]

2:40 pm: **Segmentation of materials images using 3D electron interaction modeling**, Mary L. Comer, Dae Woo Kim, Purdue Univ. (United States) . . . . . [8657-16]

3:00 pm: **A forward modeling approach to electron back-scatter diffraction patters**, Marc De Graef, Carnegie Mellon Univ. (United States) . . . . . [8657-17]

3:20 pm: **Interactive grain image segmentation using graph cut algorithms**, Jarrell W. Waggoner, Youjie Zhou, Univ. of South Carolina (United States); Jeffrey P. Simmons, Air Force Research Lab. (United States); Ayman Salem, Materials Resources International (United States); Marc De Graef, Carnegie Mellon Univ. (United States); Song Wang, Univ. of South Carolina (United States) . . . . . [8657-18]

Interactive Paper Session

Room: Grand Peninsula Ballroom A . Wed 3:30 to 5:30 pm

Interactive papers will be placed on display after 12:30 pm on Wednesday. An interactive paper session, with authors present at their papers, will be held Wednesday afternoon, 3:30 to 5:30 pm. Refreshments will be served.

Sub-pixel depth camera registration using gradient circle pattern, Seungkyu Lee, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [8657-31]

Efficient synthetic refocusing method from multiple coded aperture images for 3D user interaction, Sungjoo Suh, Changkyu Choi, Dusik Park, Chang-Yeong Kim, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . [8657-32]

Multiscale based adaptive contrast enhancement, Muhammad I. Abir, Missouri Univ. of Science and Technology (United States) and Idaho National Lab. (United States); Fahima F. Islam, Missouri Univ. of Science and Technology (United States); Daniel M. Wachs, Idaho National Lab. (United States); Hyoung Koo Lee, Missouri Univ. of Science and Technology (United States) . . . . . [8657-33]

Thursday 7 February

Session 6

Room: Harbour Room A . . . . . Thu 8:50 am to 10:10 am

Segmentation and Tracking

8:50 am: **An enhanced grid-based Bayesian array for target tracking**, Qian Sang, Zongli Lin, Scott T. Acton, Univ. of Virginia (United States) . . . . . [8657-19]

9:10 am: **A fourth-order active contour shape prior for multiple-instance object detection in images**, Ikhlef Bechar, INRIA Sophia Antipolis - Méditerranée (France); Ian H. Jermyn, Durham Univ. (United Kingdom); Josiane B. Zerubia, INRIA Sophia Antipolis - Méditerranée (France) . . . . . [8657-20]

9:30 am: **Efficient occlusion reasoning for articulated tracking in monocular views**, Landis M. Huffman, The MITRE Corp. (United States); Ilya Pollak, Purdue Univ. (United States) . . . . . [8657-21]

9:50 am: **An efficient optimizer for simple point process models**, Ahmed Gamal Eldin, INRIA Rhône-Alpes (France); Guillaume Charpiat, Xavier Descombes, Josiane B. Zerubia, INRIA Sophia Antipolis - Méditerranée (France) . . . . . [8657-22]

Coffee Break . . . . . .Thu 10:10 am to 10:50 am

Session 7

Room: Harbour Room A . . . . . Thu 10:50 am to 11:30 am

Image System Modeling and Simulation

10:50 am: **Texture mapping 3D planar models of indoor environments with noisy camera poses**, Peter Cheng, Michael Anderson, Stewart He, Avideh Zakhor, Univ. of California, Berkeley (United States) . . . . [8657-23]

11:10 am: **Optical touch sensing: practical bounds for design and performance**, Alexander Blaessle, UBC Okanagan (Canada); Bebart Janbek, Simon Fraser Univ. (Canada); Lifeng Liu, Univ. of Pittsburgh (United States); Kanna Nakamura, Univ. of Maryland, College Park (United States); Kimberly Nolan, Drexel Univ. (United States); Victor Paraschiv, Univ. of Victoria (Canada); Zachi I. Baharav, Corning Incorporated (United States) . . . . . [8657-24]

Session 8

Room: Harbour Room A . . . . . Thu 11:30 am to 12:30 pm

Reconstruction, Inverse Problems, and Noise Reduction I

11:30 am: **Light field image denoising using a linear 4D frequency-hyperfan all-in-focus filter**, Donald G. Dansereau, Daniel L. Bongiorno, Oscar Pizarro, Stefan B. Williams, The Univ. of Sydney (Australia)[8657-25]

11:50 am: **Computational imaging approach for fanbeam x-ray scatter imaging**, Joseph A O'Sullivan, David G. Politte, Washington Univ. in St. Louis (United States); Kenneth MacCabe, Kalyani Krishnamurthy, Duke Univ. (United States); Ikenna Odinaka, Washington Univ. in St. Louis (United States); Anuj Kapadia, David J. Brady, Duke Univ. (United States) . . . . . [8657-26]

12:10 pm: **Robust registration of electron tomography projections without fiducial makers**, Viet Dung Tran, Maxime Moreaud, IFP Energies Nouvelles (France); Éric M. Thiébaut, Ctr. de Recherche Astronomique de Lyon (France); Loïc Dénis, Jean Marie Becker, Lab. Hubert Curien, CNRS (France) . . . . . [8657-27]

Lunch Break . . . . . Thu 12:30 pm to 2:00 pm

Session 9

Room: Harbour Room A . . . . . Thu 2:00 pm to 3:00 pm

Reconstruction, Inverse Problems, and Noise Reduction II

2:00 pm: **Low signal noise modeling for statistical CT reconstruction**, Jean-Baptiste Thibault, GE Healthcare (United States); Ken D. Sauer, Univ. of Notre Dame (United States); Charles A. Bouman, Purdue Univ. (United States) . . . . . [8657-28]

2:20 pm: **Sensing aware metric learning**, Zach Sun, Prakash Ishwar, William C. Karl, Venkatesh Saligrama, Boston Univ. (United States) . . . . . [8657-29]

2:40 pm: **Analysis of image color and effective bandwidth as a tool for assessing air pollution at urban spatiotemporal scale**, Yael Etzion-Cohen, David M. Broday, Barak Fishbain, Technion-Israel Institute of Technology (Israel) . . . . . [8657-30]