# Computational Imaging X

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

*Program Committee:* **Samit Basu,** GE Security (United States); **Thomas S. Denney, Jr.,** Auburn Univ. (United States); **Maya R. Gupta,** Univ. of Washington (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); **Yongyi Yang,** Illinois Institute of Technology (United States)

## Monday 23 January

### SESSION 1

**Room: Harbour Room A . . . . . Mon. 8:30 am to 12:10 pm**

### Special Session on Micropscopy and Information Modeling

8:30 am: **Imaging with electrons: a review of modern modalities** *(Keynote Presentation)*, Marc DeGraef, United States (United States) . . . . . .[8296-01]

9:00 am: **Improving boundary localization in the statistical image segmentation of materials micrographs**, Mary L. Comer, Purdue Univ. (United States). . . . . .[8296-02]

9:20 am: **Scanning transmission electron tomography and applications to materials science**, Lawrence F. Drummy, Air Force Research Lab. (United States). . . . . .[8296-03]

9:40 am: **Combining global labeling and local relabeling for metallic image segmentation**, Jarrell W. Waggoner, Univ. of South Carolina (United States); Jeff Simmons, Air Force Research Lab. (United States); Song Wang, Univ. of South Carolina (United States). . . . . .[8296-04]

10:00 am: **Towards automated detection of active colitis in images of H&E-stained tissue samples**, Michael McCann, Ramu Bhagavatula, Carnegie Mellon Univ. (United States); Matthew Fickus, Air Force Institute of Technology (United States); Jelena Kovacevic, Carnegie Mellon Univ. (United States). . . . . .[8296-05]

Coffee Break . . . . . .10:20 to 10:50 am

10:50 am: **Computer-aided fiber analysis for crime scene forensics**, Mario Hildebrandt, Andrey Makrushin, Jana Dittmann, Christian Arndt, Otto-von-Guericke-Univ. Magdeburg (Germany) . . . . . .[8296-06]

11:10 am: **An automated diagnostic aid for otitis media**, Anupama Kuruvilla, Carnegie Mellon Univ. (United States); Pablo H. Hennings Yeomans, Ontario Institute for Cancer Research (Canada); Pedro Quelhas, Instituto de Engenharia Biomédica (Portugal); Alejandro Hoberman, Univ. of Pittsburgh (United States); Jelena Kovacevic, Carnegie Mellon Univ. (United States) . . . . . .[8296-07]

11:30 am: **3D reconstruction based on single-particle cryo electron microscopy images as a random signal in noise problem**, Qiu Wang, Cornell Univ. (United States); Yili Zheng, Lawrence Berkeley National Lab. (United States); Peter C. Doerschuk, Cornell Univ. (United States)[8296-08]

11:50 am: **Highly scalable methods for exploiting a label with unknown location in order to orient a set of single-particle cryo electron microscopy images**, Cory J. Prust, Milwaukee School of Engineering (United States); Peter C. Doerschuk, Cornell Univ. (United States); John E. Johnson, The Scripps Research Institute (United States). . . . . .[8296-09]

Lunch Break . . . . . 12:10 to 1:40 pm

### SESSION 2

**Room: Harbour Room A . . . . . Mon. 1:40 to 3:50 pm**

### Reconstruction

1:40 pm: **Plenoptic camera with freely movable microlenses**, Todor G. Georgiev, Adobe Systems Inc. (United States); Sergio Goma, Qualcomm Inc. (United States) . . . . . .[8296-10]

2:00 pm: **Image reconstruction using projections from a few views by discrete steering combined with DART**, Junghyun Kwon, Samuel M. Song, Brian Kauke, Douglas P. Boyd, TeleSecurity Sciences, Inc. (United States) . . . . . .[8296-11]

2:20 pm: **One-dimensional control grid interpolation-based demosaicing and color image interpolation**, Christine M. Zwart, David H. Frakes, Arizona State Univ. (United States) . . . . . .[8296-12]

2:40 pm: **Limited view angle iterative CT reconstruction for transportation security application**, Sherman J. Kisner, Charles A. Bouman, Purdue Univ. (United States) . . . . . .[8296-13]

Coffee Break . . . . . 3:00 to 3:30 pm

3:30 pm: **Variational semi-blind sparse image reconstruction with application to MRFM**, Se Un Park, Alfred O. Hero, Univ. of Michigan (United States); Nicolas Dobigeon, Univ. de Toulouse (France) . .[8296-15]

### SESSION 3

**Room: Harbour Room A . . . . . Mon. 3:50 to 5:10 pm**

### Classification and Detection

3:50 pm: **Moon search algorithms for NASA's Dawn mission to asteroid Vesta**, Nargess Memarsadeghi, Lucy A. McFadden, David R. Skillman, NASA Goddard Space Flight Ctr. (United States); Brian McLean, Max Mutchler, Space Telescope Science Institute (United States)[8296-16]

4:10 pm: **CLEAN: a false alarm reduction method for SAR CCD**, Rhonda Phillips, MIT Lincoln Lab. (United States) . . . . . .[8296-17]

4:30 pm: **Insertion of synthetic features in SAR CCD imagery**, Eric Turner, Rhonda Phillips, Miriam Cha, MIT Lincoln Lab. (United States) . . . . . .[8296-18]

4:50 pm: **Multichannel hierarchical image classification using multivariate copulas**, Aurelie Voisin, Vladimir Krylov, INRIA Sophia Antipolis - Méditerranée (France); Gabriele Moser, Sebastiano B. Serpico, Univ. degli Studi di Genova (Italy); Josiane Zerubia, INRIA Sophia Antipolis - Méditerranée (France). . . . . .[8296-19]

## Tuesday 24 January

**Room: Grand Peninsula Ballroom A . . . . . Tues. 8:20 to 9:30 am**

### Plenary Session and Society Award Presentations

8:25 am: **Computational Photography**, William T. Freeman, Massachusetts Institute of Technology (United States)

**Keynote Presentation**

**Room: Harbour Room A . . . . . Tues. 9:30 to 10:00 am**

9:30 am: **Definition of shape,** Zygmunt Pizlo, Purdue Univ. (United States) . . . . . [8296-43]

**SESSION 4**

**Room: Harbour Room A . . . . . Tues. 10:00 am to 12:10 pm**

## Enhancement, Denoising, and Restoration I

10:00 am: **Denoising and deblurring of Fourier-trasform infrared spectroscopic imaging**, Tan H. Nguyen, Rohith K. Reddy, Michael J. Walsh, Matthew Schulmerich, Gabriel Popescu, Minh N. Do, Rohit Bhargava, Univ. of Illinois at Urbana-Champaign (United States) [8296-20]

Coffee Break . . . . . .10:20 to 10:50 am

10:50 am: **Iterative weighted risk estimation for nonlinear image restoration with analysis priors**, Jeffrey Rosen, Zhihao Liu, Sathish Ramani, Jeffrey A. Fessler, Univ. of Michigan (United States) . . .[8296-21]

11:10 am: **Nonlocal transform-domain denoising of volumetric data with groupwise adaptive variance estimation**, Matteo T. Maggioni, Alessandro Foi, Tampere Univ. of Technology (Finland). . . . . .[8296-22]

11:30 am: **Non-uniform contrast correction for coded source neutron imaging**, Hector J. Santos-Villalobos, Philip R. Bingham, Oak Ridge National Lab. (United States). . . . . .[8296-23]

11:50 am: **Image enhancement and quality measures for dietary assessment using mobile devices**, Chang Xu, Fengqing Zhu, Nitin Khanna, Carol J. Boushey, Edward J. Delp III, Purdue Univ. (United States) . . . . . .[8296-24]

Lunch Break . . . . . 12:10 to 1:40 pm

**SESSION 5**

**Room: Harbour Room A . . . . . Tues. 1:40 to 2:40 pm**

## Enhancement, Denoising, and Restoration II

1:40 pm: **Risk estimates for MRI denoising**, Patrick J. Wolfe, Harvard Univ. (United States) . . . . . .[8296-25]

2:00 pm: **Subjective evaluations of example-based, total variation, and joint regularization for image processing**, Hyrum S. Anderson, Maya R. Gupta, Univ. of Washington (United States); Jon Hardeberg, Gjøvik Univ. College (Norway) . . . . . .[8296-26]

2:20 pm: **Removal of haze and noise from a single image**, Erik Matlin, Peyman Milanfar, Univ. of California, Santa Cruz (United States).[8296-27]

**SESSION 6**

**Room: Harbour Room A . . . . . Tues. 2:40 to 5:50 pm**

## Computer Vision and 3D Modeling

2:40 pm: **Finding saliency in noisy images**, Chelhwon Kim, Peyman Milanfar, Univ. of California, Santa Cruz (United States). . . . . .[8296-28]

3:00 pm: **Automatic loop closure detection using multiple cameras for 3D indoor localization**, Nicholas Corso, John Kua, Jacky Chen, Avideh Zakhor, Univ. of California, Berkeley (United States) . . . . . .[8296-29]

Coffee Break . . . . . 3:20 to 3:50 pm

3:50 pm: **An information theoretic trackability measure**, Scott T. Acton, Alla Aksel, Univ. of Virginia (United States) . . . . . .[8296-30]

4:10 pm: **Text replacement on cylindrical surfaces: a semi-automatic approach**, Hengzhou Ding, Raja Bala, Zhigang Fan, Xerox Corp. (United States); Charles A. Bouman, Jan P. Allebach, Purdue Univ. (United States) . . . . . .[8296-31]

4:30 pm: **Figure-ground organization is easier than previously thought**, Yunfeng Li, Taekyu Kwon, Purdue Univ. (United States); Longin Jan Latecki, Temple Univ. (United States); Zygmunt Pizlo, Purdue Univ. (United States). . . . . .[8296-32]

4:50 pm: **An efficient and iterative two-step depth camera self-calibration technique using depth measurements**, R. S. Pahwa, D. Babacan, M. N. Do, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[8296-41]

5:10 pm: **Registration and integration of multiple depth images using signed distance function,** D. Kubacki, H. Q. Bui, D. Babacan, M. N. Do, Univ. of Illinois at Urbana-Champaign (United States) . . . . . .[8296-42]

5:30 pm: **Image reconstruction from nonuniformly spaced samples in Fourier domain optical coherence tomography**, Jun Ke, Edmund Y. Lam, Rui Zhu, The Univ. of Hong Kong (Hong Kong, China) . . . .[8296-14]

## Interactive Paper and Symposium Demonstration Session

**Room: Grand Peninsula Ballroom E . . Tues. 5:30 to 8:00 pm**

**Demonstrations . . . . . 5:30 to 8:00 pm**

*A symposium-wide demonstration session will be open to attendees 5:30 to 8:00 pm Tuesday evening. Demonstrators will provide interactive, hands-on demonstrations of a wide-range of products related to Electronic Imaging.*

**Posters . . . . . 5:30 to 8:00 pm**

*Interactive papers will be placed on display after 10:30 am on Tuesday. An interactive paper session, with authors present at their papers, will be held Tuesday evening, 5:30 to 8:00 pm.*

**Analysis of practical coverage of uniform motions for approximating real camera shakes**, Hojin Cho, Sunghyun Cho, Pohang Univ. of Science and Technology (Korea, Republic of); Young Su Moon, Junguk Cho, Shihwa Lee, Samsung Electronics Co., Ltd. (Korea, Republic of); Seungyong Lee, Pohang Univ. of Science and Technology (Korea, Republic of) . . . . . .[8296-33]

**Real-time computational camera system for high-sensitivity imaging by using combined long/short exposure**, Satoshi Sato, Yusuke Okada, Takeo Azuma, Panasonic Corp. (Japan) . . . . . .[8296-34]

**Color correction with edge preserving and minimal SNR decrease using multi-layer decomposition**, Byung Kwan Park, Wonhee Choe, JaeGuyn Lim, SeongDeok Lee, ChangYeong Kim, Samsung Electronics Co., Ltd. (Korea, Republic of) . . . . . .[8296-35]

**Bayesian image superresolution for hyperspectral image reconstruction**, Yusuke Murayama, Ari Ide-Ektessabi, Kyoto Univ. (Japan). . . . . .[8296-36]

**ToF depth image deblurring using 3D blur shape models and motion blur saliency map (MBSM)**, Seungkyu Lee, Kate Shim, James D. K. Kim, Chang yeong Kim, Samsung Advanced Institute of Technology (Korea, Republic of) . . . . . .[8296-37]

**Computational imaging of defects in commercial substrates for electronic and photonic devices**, Ryo Kashiwagi, Masayuki Fukuzawa, Masayoshi Yamada, Kyoto Institute of Technology (Japan) . . . .[8296-38]

**Nondestructive three-dimensional measurement of gas temperature distribution by phase tomography**, Satoshi Tomioka, Shusuke Nishiyama, Hokkaido Univ. (Japan). . . . . .[8296-39]

**Closed-form inverses for the mixed pixel/multpath interference problem in AMCW lidar**, John P. Godbaz, Michael J. Cree, Adrian Dorrington, The Univ. of Waikato (New Zealand) . . . . . .[8296-40]

# Wednesday 25 January

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

## Plenary Session and Conference Award Presentations

8:25 am: **More Words and Bigger Pictures***,* David A. Forsyth, Univ. of Illinois at Urbana-Champaign (United States)