Computational Imaging XIV

Conference grouping: Image and Video Processing, Quality, and Systems

Conferences in this grouping discuss electrical resistance and impedance imaging; diffusion optical imaging; imagery-based surveillance and tracking; the readability of electronic paper and mobile displays; image preference measurement and modeling; medical and forensic imaging; genetic and evolutionary computing; steganography and data hiding, microarray imaging; electronic cinema; multimedia content retrieval; and image and video compression, communications, segmentation and recognition, restoration and enhancement, among other topics.

Conference overview

More than ever before, computers and computation are critical to the image formation process. Across diverse applications and fields, remarkably similar imaging problems appear, requiring sophisticated mathematical, statistical, and algorithmic tools. This conference focuses on imaging as a marriage of computation with physical devices. It emphasizes the interplay between mathematical theory, physical models, and computational algorithms that enable effective current and future imaging systems. Contributions to the conference are solicited on topics ranging from fundamental theoretical advances to detailed system-level implementations and case studies.

Photo: Dietmar Wueller.

Conference Chairs and Program Committee:
Charles A. Bouman, Purdue Univ. (USA), and
Ken D. Sauer, Univ. of Notre Dame (USA)

Computational Imaging XIV

Tuesday, February 16, 2016

Keynote: Indoor and Outdoor Image Based Localization for Mobile Devices
Session Chair: Charles Bouman, Purdue University (USA)
8:50 – 9:50 am
Golden Gate 1

8:50 COIMG-147
Indoor and outdoor image based localization for mobile devices, *Avideh Zakhor, University of California, Berkeley (USA)*

Optimization and Learning

Session Chair: Peyman Milanfar, Google, Inc. (USA)

9:50 – 10:30 am
Golden Gate 1

9:50 COIMG-148
An alternating direction method of multiplier algorithm for single-photon imaging sensors, *Stanley Chan, Purdue University (USA)*

10:10 COIMG-149
Adaptive activation functions for deep networks, *Michael Dushkoff, Rochester Institute of Technology (USA)*

10:30 – 10:50 am Coffee Break

Optimization and Learning (continued)

Session Chair: Peyman Milanfar, Google, Inc. (USA)

10:50 – 12:30 pm
Golden Gate 1

10:50 COIMG-150
Filtering without normalization, *Peyman Milanfar, Google, Inc. (USA)*

11:10 COIMG-151
Sparse non-local interpolation for nano-scale imaging, *Suhas Sreehari[1], Singanallur Venkatakrishnan[2], Jeffrey Simmons[3], Lawrence Drummy[3], and Charles Bouman[1]; [1]Purdue University, [2]Lawrence Berkeley National Laboratory, and [3]Air Force Research Laboratory (USA)*

11:30 COIMG-152
Hierarchical decomposition of large deep networks, *Vijaya Naga Jyoth Sumanth Chennupati, Shagan Sah, Sai Prasad Nooka, and Raymond Ptucha, Rochester Institute of Technology (USA)*

11:50 COIMG-153
A supervised learning approach for dynamic image sampling, *G.M. Dilshan Godaliyadda[1], Dong Ye[1], Michael Uchic[2], Michael Groeber[2], Gregery Buzzard[3], and Charles Bouman[1]; [1]Purdue University and [2]Air Force Research Laboratory (USA)*

12:10 COIMG-154
Stochastic first-order minimization techniques using Jensen's surrogates for x-ray transmission tomography, *Soysal Degirmenci[1], Joseph O'Sullivan[1], and David Politte[2]; [1]Washington University and [2]Washington University School of Medicine (USA)*

12:30 – 2:00 pm Lunch Break

EI 2016 Tuesday Plenary and Symposium Awards
Session Chair: Nitin Sampat (Rochester Institute of Technology)
2:00 – 3:00 PM
Continental Ballroom 5

Pushing computational photography deeper into imaging system design, *Ren Ng, University of California, Berkeley (USA)*

3:00 – 3:30 pm Coffee Break

Scientific Imaging

Session Chair: Dilworth Parkinson, University of California, Berkeley (USA)

3:30 – 5:10 pm
Golden Gate 1

3:30 COIMG-155
Making advanced scientific algorithms and big scientific data management more accessible, *Dilworth Parkinson[1], Luis Barroso-Luque[1], Keith Beattie[2], Joaquin Correa[3], Eli Dart[4], Jack Deslippe[3], Alexander Hexemer[1], Harinarayan Krishnan[2], Alastair MacDowell[1], Stefano Marchesini[1], Simon Patton[2], Talita Perciano[2], James Sethian[2,5], Rune Stromsness[6], Michael Tang[1], Brian Tierney[4], Craig Tull[2], Daniela Ushizima[2], and Singanallur Venkatakrishnan[1]; [1]Lawrence Berkeley National Laboratory, [3]National Energy Research Scientific Computing Center, [4]Energy Sciences Network, and [5]University of California, Berkeley (USA)*

3:50 COIMG-156
Simulation of abnormal grain growth in polycrystalline materials, *Shruthi Kubatur and Mary Comer, Purdue University (USA)*

4:10 COIMG-157
Reducing restoration artifacts in 3D computational microscopy using wavefront encoding, *Nurmohammed Patwary and Chrysanthe Preza, University of Memphis (USA)*

4:30 COIMG-158
Single shot digital holography based on iterative reconstruction with alternating updates of amplitude and phase, *Dennis Lee[1,2], Charles Bouman[2], and Andrew Weiner[2]; [1]Sandia National Laboratories and [2]Purdue University (USA)*

4:50 COIMG-159
Remote heart rate estimation using small variation amplification, *Dahjung Chung, Jeehyun Choe, Marguerite E. O'Haire, A.J. Schwichtenberg, and Edward Delp, Purdue University (USA)*

EI 2016 Symposium Demonstration Session and Exhibit Hall Happy Hour
5:30 – 7:00 PM
Continental Ballroom Foyer

Wednesday, February 17, 2016

Image and Signal Analysis

Session Chair: James Theiler, Los Alamos National Laboratory (USA)

8:50 – 10:10 am
Golden Gate 1

8:50 COIMG-160
Right spectrum in the wrong place: A framework for local hyperspectral anomaly detection, *James Theiler, Los Alamos National Laboratory (USA)*

9:10 COIMG-161
Data adaptive affinity functions in unsupervised segmentation, *Reid Porter, Diane Oyen, and James Theiler, Los Alamos National Laboratory (USA)*

9:30 COIMG-162
A strip-based fast text detection algorithm for low cost embedded devices, *Jobin J. Mathew[1], Yue Wang[1], Eli Saber[1], David Larson[2], Peter Bauer[2], George Kerby[2], and Jerry Wagner[2]; [1]Rochester Institute of Technology and [2]Hewlett Packard Company (USA)*

9:50 COIMG-163
Automatic computer detection and power estimation in indoor environments from imagery, *Satarupa Mukherjee, Hariprasad P.S., Omar Oreifej, Brian Pugh, Eric Turner, and Avideh Zakhor, University of California, Berkeley (USA)*

10:10 – 10:30 am Coffee Break

Nondestructive Evaluation and Security Imaging

Session Chair: David Castañón, Boston University (USA)

10:30 am – 12:10 pm
Golden Gate 1

10:30 COIMG-164
Simulation of an inverse schlieren image acquisition system for inspecting transparent objects, *Johannes Meyer[1,2], Thomas Längle[1,2], Jürgen Beyerer[1,2], and Robin Gruna[2]; [1]Karlsruhe Institute for Technology and [2]Fraunhofer IOSB (Germany)*

10:50 COIMG-165
Enhancing nuclear resonance fluorescence with coded aperture for security based imaging, *Zachary Sun, Clem Karl, and David Castañón, Boston University (USA)*

11:10
The unavoidable use of computational imaging on next generation biometric identification systems, *Jens Gregor[1] and Hector Santos-Villalobos[2]; [1]University of Tennessee and [2]Oak Ridge National Laboratory (USA)*

11:30 COIMG-167
Sparse angle 3-D X-ray reconstructions on GPU processors, *Fernando Quivira[1], Simon Bedford[2], Richard Moore[3], John Beaty[4], and David Castañón[5]; [1]Northeastern University, [2]Astrophysics, [3]Massachusetts General Hospital, and [5]Boston University (USA)*

11:50 COIMG-521
Non-destructive evaluation for destruction: x-ray imaging for hard drive magnet recovery, *Jeffrey S. Kallman, Karina P. Bond, William D. Brown, and Harry E. Martz; Lawrence Livermore National Laboratory (USA)*

12:10 – 2:00 pm Lunch Break

EI 2016 Wednesday Plenary and Symposium Awards
Session Chair: Choon-Woo Kim (Inha University)
2:00 – 3:00 PM
Continental Ballroom 5

Intel® RealSense Technology: Adding human-like sensing and interactions to computing devices, *Achin Bhowmik, Intel Corporation (USA)*

3:00 – 3:30 pm Coffee Break

Reconstruction and Restoration

Session Chair: Hector Santos-Villalobos, Oak Ridge National Laboratory (USA)

3:30 – 5:30 pm
Golden Gate 1

3:30 COIMG-168
Depth-guided deblurring, *Thomas Hach[1] and Arvind Amruth[2]; [1]Arnold & Richter Cinetechnik and [2]Technical Univ. Munich (Germany)*

3:50 COIMG-169
Spectral resolution enhancement of hyperspectral images via sparse representations, *Konstantina Fotiadou[1,2], Grigorios Tsagkatakis[1], and Panagiotis Tsakalides[1,2]; [1]Foundation for Research and Technology (FORTH), Institute of Computer Science (ICS) and [2]University of Crete (Greece)*

4:10 COIMG-170
Multi-spectral infrared computed tomography, *Philip Bingham, Marissa Morales, Panos Datskos, and David Graham, Oak Ridge National Laboratory (USA)*

4:30 COIMG-171
Multi-modal kHz frame rate multi-photon microscopy pairing Lissajous trajectory beam-scanning with model-based image reconstruction, *Garth Simpson, Shane Sullivan, Ryan Muir, Justin Newman, Suhas Sreehari, and Charles Bouman, Purdue University (USA)*

4:50 COIMG-172
Non-uniform neutron source approximation for the iterative reconstruction of coded source images, *Hector Santos-Villalobos[1], Dustin Morris[1], Jens Gregor[2], and Philip Bingham[1]; [1]Oak Ridge National Laboratory and [2]University of Tennessee (USA)*

5:10 COIMG-173
Exploiting structure and variable-dependency modeling in block-based compressed sensing image reconstruction in the presence of non-linear mixtures (JIST-first), *Lynn Keuthan[1], Robert Harrington[1], and Jefferson Willey[2]; [1]The George Washington University and [2]U.S. Naval Research Lab. (USA)*

Computational Imaging XIV Interactive Papers Session

5:30 – 7:00 pm
Continental Ballroom 6

The following works will be presented at the EI 2016 Symposium Interactive Papers Session.

COIMG-174
Gradient enhanced image pyramid for improved nonlinear image registration, *Lin Gan and Gady Agam, Illinois Institute of Technology (USA)*

COIMG-175
Hidden watermark of 3D models by just noticeable color difference, *Tzung-Han Lin, National Taiwan University of Science and Technology (Taiwan)*

COIMG-176
Illumination normalization and skin color verification for robust face detection, *Sanghun Lee and Chulhee Lee, Yonsei University (South Korea)*

COIMG-177
Improved reconstruction for compressive hyperspectral imaging using spatial-spectral non-local means regularization, *Pablo Meza[1], Esteban Vera[2], and Javier Martínez[1]; [1]Universidad de La Frontera (Chile) and [2]Duke University (USA)*

COIMG-178
Protein chemical cross-linking/mass spectrometry: From raw data to fully immersive visualizations, *Islam Ebeid[1], Carolina Cruz-Neira[1], Mihir Jaiswal[2], and Boris Zybaylov[2]; [1]University of Arkansas at Little Rock and [2]University of Arkansas for Medical Sciences (USA)*

COIMG-179
Real-time depth estimation and view interpolation using Quasar, *Bart Goossens, Simon Donne, Jan Aelterman, Jonas De Vylder, Dirk Van Haerenborgh, and Wilfried Philips, Universiteit Gent (Belgium)*

EI 2016 Symposium Interactive Papers Session
5:30 – 7:00 PM
Continental Ballroom 6