



Society for Imaging Science and Technology

REGISTER

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Sponsor

Qualcomm

IS&T International Symposium on

Electronic Imaging 2020
SCIENCE AND TECHNOLOGY

26–30 January 2020
Burlingame, California USA

COMPUTATIONAL IMAGING XVIII

Conference Keywords: *Inverse Problems, Image Reconstruction, Image Analysis, Denoising, Model-based Imaging*

[COIMG XVIII 2020 Call for Papers PDF](#)

Program Overview Topics

Monday January 27, 2020

Plug and Play Approaches

Session Chair: W. Clem Karl, Boston University (United States)
8:45 – 10:10 AM

Grand Peninsula B/C

8:45

Conference Welcome

8:50

COIMG-005

Plug-and-play AMP for image recovery with Fourier-structured operators, Subrata Sarkar, Rizwan Ahmad, and Philip Schniter, Ohio State University (United States)

9:10

COIMG-006

A splitting-based iterative algorithm for GPU-accelerated statistical

Important Dates

Call for Papers Announced

Journal-first Submissions Due

Abstract Submission Site Opens

Review Abstracts Due (*refer to For A*)

· Early Decision Ends

· Regular Submission Ends

· Extended Submission Ends

Final Manuscript Deadlines

· Manuscripts for Fast Track

· All Manuscripts

Registration Opens

Early Registration Ends

Hotel Reservation Deadline

Conference Begins

Conference Proceedings

[2020](#)

[2019](#)

[2018](#)

[2017](#)

[2016](#)

Conference Chairs

Charles A.

Bouman, Purdue University (United States);

Gregery T.

Buzzard, Purdue

Events
Publications
Standards

Careers
Policies

dual-energy x-ray CT reconstruction, Fangda Li, Ankit Manerikar, Tanmay Prakash, and Avinash Kak, Purdue University (United States)

Donate
9:30

COIMG-007

Proximal Newton Methods for x-ray imaging with non-smooth regularization, Tao Ge, Umberto Villa, Ulugbek Kamilov, and Joseph O'Sullivan, Washington University in St. Louis (United States)

9:50

COIMG-008

Integrating learned data and image models through consensus equilibrium, W. Clem Karl and Muhammad Usman Ghani, Boston University (United States)

10:10 – 10:50 AM Coffee Break

Scientific Imaging I

Session Chair: Eric Miller, Tufts University (United States)

10:50 AM – 12:30 PM

Grand Peninsula B/C

10:50

COIMG-043

Learned priors for the joint pycho-tomography reconstruction, Selin Aslan, Argonne National Laboratory (United States)

11:10

COIMG-044

A joint reconstruction and lambda tomography regularization technique for energy-resolved x-ray imaging, James Webber, Eric Quinto, and Eric Miller, Tufts University (United States)

11:30

COIMG-045

Generalized tensor learning with applications to 4D-STEM image denoising, Rungang Han¹, Rebecca Willett², and Anru Zhang¹; ¹University of Wisconsin-Madison and ²University of Chicago (United States)

11:50

COIMG-046

Computational imaging in infrared sensing of the atmosphere,

University (United States); **Robert L. Stevenson**, University of Notre Dame (United States)

Program Committee

Clem Karl, Boston University (United States); **Eric Miller**, Tufts University (United States); **Joseph A O'Sullivan**, Washington University in St. Louis (United States); **Hector J Santos-Villalobos**, Oak Ridge National Laboratory (United States); **Ken D. Sauer**, University of Notre Dame (United States)

Computational Microscopy Special Session Organizers

Singanallur V Venkatakrisnan, Oak Ridge National Laboratory (United States); **Ulugbek S Kamilov**,

Adam Milstein, Yaron Rachlin, Corrie Smeaton, Charles Wynn, Ryan Sullenberger, Philip Chapnik, Steven Leman, and William Blackwell, MIT Lincoln Laboratory (United States)

12:10

COIMG-047

Learning optimal sampling for computational imaging, He Sun¹, Adrian Dalca², and Katherine Bouman^{1,1}; California Institute of Technology and ²Harvard Medical School (United States)

12:30 – 2:00 PM Lunch

PLENARY: Frontiers in Computational Imaging

Session Chairs: Jonathan Phillips, Google Inc. (United States) and Radka Tezaur, Intel Corporation (United States)

2:00 – 3:10 PM

Grand Peninsula D

Imaging the unseen: Taking the first picture of a black hole, Katherine Bouman, California Institute of Technology (United States)

Katherine Bouman is an assistant professor in the Computing and Mathematical Sciences Department at the California Institute of Technology. Before joining Caltech, she was a postdoctoral fellow in the Harvard-Smithsonian Center for Astrophysics. She received her PhD in the Computer Science and Artificial Intelligence Laboratory (CSAIL) at MIT in EECS. Before coming to MIT, she received her bachelor's degree in electrical engineering from the University of Michigan. The focus of her research is on using emerging computational methods to push the boundaries of interdisciplinary imaging.

3:10 – 3:30 PM Coffee Break

Scientific Imaging II

Session Chair: Brendt Wohlberg, Los Alamos National Laboratory (United States)

Washington University in St. Louis (United States)

Optically-Coherent and Interferometric Imaging Special Session Organizer

Casey Pellizzari, United States Air Force Academy (United States)

Computational Imaging Applications to Materials Characterization Special Session Organizers

Jeff Simmons, Air Force Research Laboratory (United States); **Stephen Niezgoda,** The Ohio State University (United States)

Algorithm/Hardware Co-Design for Computational Imaging Special Session Organizers

States)

3:30 – 4:10 PM

Grand Peninsula B/C

3:30

COIMG-058

Revealing subcellular structures with live-cell and 3D fluorescence nanoscopy, Fang Huang, Purdue University (United States)

3:50

COIMG-059

Single-shot coded diffraction system for 3D object shape estimation, Samuel Pinilla¹, Laura Galvis¹, Karen Egiazarian², and Henry Arguello¹; ¹Universidad Industrial de Santander (Colombia) and ²Tampere University (Finland)

PANEL: The Future of Computational Imaging

Panel Moderator: Charles Bouman, Purdue University (United States)
 Panelists: Katherine Bouman, California Institute of Technology (United States); Sergio Goma, Qualcomm Inc. (United States); Peyman Milanfar, Google Research (United States); Casey Pellizzari, United States Air Force Academy (United States); and Brendt Wohlberg, Los Alamos National Laboratory (United States)

4:10 – 4:50 PM

Grand Peninsula B/C

Electronic imaging is evolving rapidly under the influence of new imaging devices combined with computational approaches and artificial intelligence. Computational imaging, composing images through a combination of data acquisition and data processing, has applications to autonomous vehicles, medical imaging, astronomical imaging, remote sensing, etc. Computational imaging topics surface throughout the EI 2020 week, including the Monday plenary, "Imaging the Unseen: Taking the First Picture of a Black Hole," and presentations in conferences such as Autonomous Vehicles and Machines 2020, Computational Imaging XVIII, Imaging and Multimedia Analytics in a Web and Mobile World 2020, and Image Processing: Algorithms and Systems XVIII. This panel brings together researchers and practitioners to look into the futures of these technologies.

Sergio Goma,

Qualcomm
Technologies
Inc. (United States);

Hasib

Saddiqui, Qualcomm
Technologies
Inc. (United States)

5:00 – 6:00 PM All-Conference Welcome Reception

Tuesday January 28, 2020

7:30 – 8:45 AM Women in Electronic Imaging Breakfast (pre-registration required)

KEYNOTE: Computation and Photography

Session Chair: Charles Bouman, Purdue University (United States)

8:50 – 9:30 AM

Grand Peninsula B/C

COIMG-089

Computation and photography: How the mobile phone became a camera, Peyman Milanfar, Google Research (United States)

Peyman Milanfar is a principal scientist / director at Google Research, where he leads Computational Imaging. Previously, he was professor of electrical engineering at UC Santa Cruz (1999-2014). Most recently, Peyman's team at Google developed the "Super Res Zoom" pipeline for the Pixel phones. Peyman received his BS in electrical engineering and mathematics from UC Berkeley, and his MS and PhD in EECS from MIT. He founded MotionDSP, which was acquired by Cubic Inc. He is a Distinguished Lecturer of the IEEE Signal Processing Society, and a Fellow of the IEEE.

Optically-Coherent and Interferometric Imaging I

Session Chair: Casey Pellizzari, United States Air Force Academy (United States)

9:30 – 10:30 AM**Grand Peninsula B/C**

Optically-coherent and interferometric imaging sensors provide a means to measure both the amplitude and phase of incoming light. These sensors depend on computational-based methods to convert real-valued intensity measurements into amplitude and phase information for image reconstruction. Additionally, computational methods have helped overcome many of the practical issues associated with these sensors as well as enabled new imaging modalities. This session explores the coupling between optically-coherent and interferometric sensors and the computational methods that enable and extend their use. Example topic areas include both coherent and incoherent holography, coherent lidar, microscopy, metrology, and astronomy.

9:30**COIMG-111**

Spectral shearing LADAR, Jason Stafford¹, David Rabb¹, Kyle Watson², Brett Spivey², and Ryan Galloway^{3,1}; ¹United States Air Force Research Laboratory, ²JASR Systems, and ³Montana State University (United States)

9:50**COIMG-112**

3D computational phase microscopy with multiple-scattering samples, Laura Waller¹, Shwetadwip Chowdhury¹, Michael Chen¹, Yonghuan David Ren¹, Regina Eckert¹, Michael Kellman¹, and Eemrah Bostan^{2,1}; ¹University of California, Berkeley (United States) and ²University of Amsterdam (the Netherlands)

10:10**COIMG-113**

Imaging through deep turbulence and emerging solutions, Mark Spencer¹, Casey Pellizzari², and Charles Bouman^{3,1}; ¹Air Force Research Laboratory, ²United States Air Force Academy, and ³Purdue University (United States)

10:00 AM – 7:30 PM Industry Exhibition - Tuesday

10:10 – 10:50 AM Coffee Break

Optically-Coherent and Interferometric Imaging II

Session Chair: Casey Pellizzari, United States Air Force Academy (United States)

10:50 – 11:30 AM

Grand Peninsula B/C

Optically-coherent and interferometric imaging sensors provide a means to measure both the amplitude and phase of incoming light. These sensors depend on computational-based methods to convert real-valued intensity measurements into amplitude and phase information for image reconstruction. Additionally, computational methods have helped overcome many of the practical issues associated with these sensors as well as enabled new imaging modalities. This session explores the coupling between optically-coherent and interferometric sensors and the computational methods that enable and extend their use. Example topic areas include both coherent and incoherent holography, coherent lidar, microscopy, metrology, and astronomy.

10:50

COIMG-125

Holographic imaging through highly attenuating fog conditions,

Abbie Watnik¹, Samuel Park¹, James Lindle², and Paul Lebow^{3,1}; ¹United States Naval Research Laboratory, ²DCS Corporation, and ³Alaire Technologies (United States)

11:10

COIMG-126

Intensity interferometry-based 3D ranging,

Fabian Wagner¹, Florian Schiffers¹, Florian Willomitzer¹, Oliver Cossairt¹, and Andreas Velten²; ¹Northwestern University and ²University of Wisconsin-Madison (United States)

Phase Coherent Imaging

Session Chair: Charles Bouman, Purdue University (United States)

11:30 AM – 12:10 PM

Grand Peninsula B/C

11:30

COIMG-146

Constrained phase retrieval using a non-linear forward model for x-ray phase contrast tomography, K. Aditya Mohan, Jean-Baptiste

Forien, and Jefferson Cuadra, Lawrence Livermore National Laboratory (United States)

11:50

COIMG-147

Multi-wavelength remote digital holography: Seeing the unseen by imaging off scattering surfaces and imaging through scattering media, Florian Willomitzer¹, Prasanna Rangarajan², Fengqiang Li¹, Muralidhar Madabhushi Balaji², and Oliver Cossairt¹; ¹Northwestern University and ²Southern Methodist University (United States)

Recent Progress in Computational Microscopy I

Session Chair: Singanallur Venkatakrisnan, Oak Ridge National Laboratory (United States)

12:10 – 12:30 PM

Grand Peninsula B/C

Microscopy is currently experiencing an exciting era of new methodological developments with computation at its core. The recent progress in compressive imaging, numerical physical models, regularization techniques, large-scale optimization methods, and machine learning are leading to a faster, quantitative, and reliable microscopic imaging. Though many computational methods are being developed independently for different modalities, their combination may be seen as example of a new paradigm of rapid, comprehensive, and information-rich computational microscopy. This session will explore cross-cutting themes in several modalities such as optical, neutron, x-ray, and electron microscopy and will attempt to promote transfer of ideas between investigators in these different areas.

12:10

COIMG-152

3D DiffuserCam: Computational microscopy with a lensless imager, Laura Waller, University of California, Berkeley (United States)

12:30 – 2:00 PM Lunch

PLENARY: Automotive Imaging

Session Chairs: Jonathan Phillips, Google Inc. (United States) and Radka Tezaur, Intel Corporation (United States)

2:00 – 3:10 PM

Grand Peninsula D

Imaging in the autonomous vehicle revolution, Gary Hicok, NVIDIA Corporation (United States)

Gary Hicok is senior vice president of hardware development at NVIDIA, and is responsible for Tegra System Engineering, which oversees Shield, Jetson, and DRIVE platforms. Prior to this role, Hicok served as senior vice president of NVIDIA's Mobile Business Unit. This vertical focused on NVIDIA's Tegra mobile processor, which was used to power next-generation mobile devices as well as in-car safety and infotainment systems. Before that, Hicok ran NVIDIA's Core Logic (MCP) Business Unit also as senior vice president. Throughout his tenure with NVIDIA, Hicok has also held a variety of management roles since joining the company in 1999, with responsibilities focused on console gaming and chipset engineering. He holds a BSEE from Arizona State University and has authored 33 issued patents.

3:10 – 3:30 PM Coffee Break

Recent Progress in Computational Microscopy II

Session Chair: Singanallur Venkatakrisnan, Oak Ridge National Laboratory (United States)

3:30 – 5:10 PM

Grand Peninsula B/C

Microscopy is currently experiencing an exciting era of new methodological developments with computation at its core. The recent progress in compressive imaging, numerical physical models, regularization techniques, large-scale optimization methods, and machine learning are leading to a faster, quantitative, and reliable microscopic imaging. Though many computational methods are being developed independently for different modalities, their combination may be seen as example of a new paradigm of rapid, comprehensive, and information-rich computational microscopy. This session will explore cross-cutting themes in

several modalities such as optical, neutron, x-ray, and electron microscopy and will attempt to promote transfer of ideas between investigators in these different areas.

3:30 **COIMG-156**
Computational nanoscale imaging with synchrotron radiation,
Doga Gursoy, Argonne National Laboratory (United States)

3:50 **COIMG-157**
Recent advances in 3D structured illumination microscopy with reduced data-acquisition, *Chrysanthe Preza, The University of Memphis (United States)*

4:10 **COIMG-158**
Method of moments for single-particle cryo-electron microscopy,
Amit Singer, Princeton University (United States)

4:30 **COIMG-159**
Computational imaging in transmission electron microscopy: Atomic electron tomography and phase contrast imaging, *Colin Ophus, Lawrence Berkeley National Laboratory (United States)*

4:50 **COIMG-160**
3D and 4D computational imaging of molecular orientation with multiview polarized fluorescence microscopy, *Talon Chandler¹, Min Guo², Rudolf Oldenbourg³, Hari Shroff², and Patrick La Riviere¹; The University of Chicago,² National Institutes of Health, and³ Marine Biological Laboratory (United States)*

DISCUSSION: Tuesday Tech Mixer

Hosts: Charles Bouman, Purdue University (United States); Gregory Buzzard, Purdue University (United States); and Robert Stevenson, University of Notre Dame (United States)

5:10 – 5:40 PM

Grand Peninsula B/C

Computational Imaging Conference Tuesday wrap-up discussion and refreshments.

5:30 – 7:30 PM Symposium Demonstration Session

Wednesday January 29, 2020

Medical Imaging

Session Chair: Evan Morris, Yale University (United States)

8:50 – 10:10 AM

Grand Peninsula B/C

8:50

COIMG-191

Model comparison metrics require adaptive correction if parameters are discretized: Application to a transient

neurotransmitter signal in PET data, Heather Liu and Evan Morris, Yale University (United States)

9:10

COIMG-192

Computational pipeline and optimization for automatic multimodal reconstruction of marmoset brain histology, Brian Lee¹, Meng Lin², Junichi Hata², Partha Mitra³, and Michael Miller^{1,1}; Johns Hopkins University (United States), ²RIKEN Brain Science Institute (Japan), and ³Cold Spring Harbor Laboratory (United States)

9:30

COIMG-193

Model-based approach to more accurate stopping power ratio

estimation for proton therapy, Maria Medrano¹, Jeffrey Williamson², Bruce Whiting³, David Politte⁴, Shuanyue Zhang¹, Tyler Webb¹, Tianyu Zhao⁴, Ruirui Liu⁴, Mariela Porras-Chaverri², Tao Ge¹, Rui Liao¹, and Joseph O'Sullivan¹; Washington University in St. Louis (United States), ²University of Costa Rica (Costa Rica), ³University of Pittsburg (United States), and ⁴Washington University School of Medicine (United States)

9:50

COIMG-194

Deep learning based regularized image reconstruction for respiratory gated PET, *Tiantian Li¹, Mengxi Zhang¹, Wenyuan Qi², Evren Asma², and Jinyi Qi¹*; ¹University of California, Davis and ²Canon Medical Research (United States), Inc. (United States)

10:00 AM – 3:30 PM Industry Exhibition - Wednesday

10:10 – 10:50 AM Coffee Break

Computational Imaging Applications to Materials Characterization

Session Chair: Jeffrey Simmons, Air Force Research Laboratory (United States)

10:50 AM – 12:30 PM

Grand Peninsula B/C

Materials science, like physics, focuses on forward modeling almost exclusively for analysis. This creates opportunities for imaging scientists to make significant advances by introducing modern, inversion-based methods for analysis of microscope imagery. Materials Science emerged as a true "scientific" discipline, with the development of microscopy because it allowed the materials scientist to observe the "microstructure," that is, the texture produced by the processes used for preparing the material. For this reason, materials science and microscopy have always been intimately linked, with the major connection being microstructure as a means of controlling properties. Until quite recently materials characterization was largely "photons-on-film." With the digital transition of microscopy from film to data file, microscopy became a computational imaging problem. With the automation of data collection, it became imperative to develop algorithms requiring less human interaction. This session highlights recent advances in materials science as a direct consequence of cross-disciplinary approaches between computational imaging and materials science. This session covers, but is not limited to, forward modeling of material-probe-detector interactions, segmentation, anomaly detection, data fusion, denoising, learning approaches, detection and tracking, and super-resolution.

10:50

COIMG-404

Deepfake, artificial intelligence: will machines replace us all?,

Huolin Xin, University of California, Irvine (United States)

11:10 **COIMG-248**

Crystallographic symmetry for data augmentation in detecting dendrite cores, Lan Fu¹, Hongkai Yu², Megna Shah³, Jeffrey Simmons³, and Song Wang^{1,1}; University of South Carolina,² University of Texas, and³ Air Force Research Laboratory (United States)

11:30 **COIMG-249**

Multi-resolution data fusion for super resolution imaging of biological materials, Emma Reid¹, Cheri Hampton², Asif Mehmood², Gregery Buzzard¹, Lawrence Drummy², and Charles Bouman¹; ¹Purdue University and ²Air Force Research Laboratory (United States)

11:50 **COIMG-250**

Void detection and fiber extraction for statistical characterization of fiber-reinforced polymers, Camilo Aguilar Herrera and Mary Comer, Purdue University (United States)

12:10 **COIMG-251**

Applications of denoising, structure optimization, and deep learning in high resolution electron microscopy, Chenyu Zhang and Paul Voyles, University of Wisconsin-Madison (United States)

12:30 – 2:00 PM Lunch

PLENARY: VR/AR Future Technology

Session Chairs: Jonathan Phillips, Google Inc. (United States) and Radka Tezaur, Intel Corporation (United States)

2:00 – 3:10 PM

Grand Peninsula D

Quality screen time: Leveraging computational displays for spatial computing, Douglas Lanman, Facebook Reality Labs (United States)

Douglas Lanman is the director of Display Systems Research at Facebook Reality Labs, where he leads investigations into advanced display and imaging technologies for augmented and virtual reality. His prior research has focused on head-mounted displays, glasses-free 3D displays, light-field cameras, and active illumination for 3D reconstruction and interaction. He received a BS in Applied Physics with Honors from Caltech in 2002 and his MS and PhD in Electrical Engineering from Brown University in 2006 and 2010, respectively. He was a senior research scientist at NVIDIA Research from 2012 to 2014, a postdoctoral associate at the MIT Media Lab from 2010 to 2012, and an assistant research staff member at MIT Lincoln Laboratory from 2002 to 2005. His most recent work has focused on developing the Oculus Half Dome: an eye-tracked, wide-field-of-view varifocal HMD with AI-driven rendering.

3:10 – 3:30 PM Coffee Break

Materials Imaging

Session Chair: David Castañón, Boston University (United States)

3:30 – 4:10 PM

Grand Peninsula B/C

3:30

COIMG-263

Mueller matrix imaging for classifying similar diffuse materials, *Lisa Li, Meredith Kupinski, Madellyn Brown, and Russell Chipman, The University of Arizona (United States)*

3:50

COIMG-264

Modeling multivariate tail behavior in materials data, *Lucas Costa, Tomas Comer, Daniel Greiwe, Camilo Aguilar Herrera, and Mary Comer, Purdue University (United States)*

Security Imaging

Session Chair: David Castañón, Boston University (United States)

4:10 – 4:50 PM

Grand Peninsula B/C

4:10**COIMG-293**

A spectrum-adaptive decomposition method for effective atomic number estimation using dual energy CT, *Ankit Manerikar, Fangda Li, Tanmay Prakash, and Avinash Kak, Purdue University (United States)*

4:30**COIMG-294**

Metal artifact reduction in dual-energy CT with synthesized monochromatic basis for baggage screening, *Sandamali Devadithya and David Castañón, Boston University (United States)*

DISCUSSION: Wednesday Tech Mixer

Hosts: Charles Bouman, Purdue University (United States); Gregory Buzzard, Purdue University (United States); and Robert Stevenson, University of Notre Dame (United States)

4:50 – 5:30 PM

Grand Peninsula B/C

Computational Imaging Conference Wednesday wrap-up discussion and refreshments.

Computational Imaging XVIII Interactive Posters Session

5:30 – 7:00 PM

Sequoia

The following works will be presented at the EI 2020 Symposium Interactive Posters Session.

COIMG-305

Connected-tube MPP model for unsupervised 3D fiber detection, *Tianyu Li, Mary Comer, and Michael Sangid, Purdue University (United States)*

COIMG-306**Imaging through scattering media with a learning based prior,**

Florian Schiffers, Lionel Fiske, Pablo Ruiz, Aggelos K Katsaggelos, and Oliver Cossairt, Northwestern University (United States)

COIMG-307**Reconstruction of 2D seismic wavefields from nonuniformly**

sampled sources, *Laura Galvis¹, Juan Ramirez¹, Edwin Vargas¹, Ofelia Villarreal², William Agudelo³, and Henry Arguello¹; Universidad Industrial de Santander,² Cooperativa de Tecnólogos e Ingenieros de la Industria del Petróleo y Afines, TIP, and³ Instituto Colombiano del Petróleo, ICP, Ecopetrol S.A. (Colombia)*

5:30 – 7:00 PM EI 2020 Symposium Interactive Posters Session

5:30 – 7:00 PM Meet the Future: A Showcase of Student and Young Professionals Research

Thursday January 30, 2020

Deep Learning in Computational Imaging

Session Chair: Gregory Buzzard, Purdue University (United States)

8:50 – 10:10 AM

Grand Peninsula B/C

8:50

COIMG-341

2D label free microscopy imaging analysis using machine learning,

Han Hu¹, Yang Lei², Daisy Xin², Viktor Shkolnikov², Steven Barcelo², Jan Allebach¹, and Edward Delp¹; Purdue University and² HP Labs, HP Inc. (United States)

9:10

COIMG-342

ProPaCoL-Net: A novel recursive stereo SR net with progressive parallax coherency learning,

Jeonghun Kim and Munchurl Kim, Korea Advanced Institute of Science and Technology (Republic of Korea)

9:30**COIMG-343**

Deep learning method for height estimation of sorghum in the field using LiDAR, Matthew Waliman and Avidah Zakhor, University of California, Berkeley (United States)

9:50**COIMG-344**

Background subtraction in diffraction x-ray images using deep CNN, Rodrigo Aranguren Carmona, Gady Agam, and Thomas Irving, Illinois Institute of Technology (United States)

10:10 – 10:50 AM Coffee Break

Algorithm/Hardware Co-Design for Computational Imaging

Session Chair: Sergio Goma, Qualcomm Inc. (United States)

10:50 AM – 12:10 PM

Grand Peninsula B/C

The aim of this session is to take computational imaging concepts a step further and to set a stepping stone towards an optimal, technology dependent implementation of computational imaging: algorithm-hardware co-design. Complex algorithms thrive on clean data sets therefore sensors that are designed in conjunction with supporting algorithms can offer significantly improved results. This session is soliciting original contributions that relate to the joint design of sensors and/or technology in conjunction with algorithms.

10:50**COIMG-355**

Estimation of the background illumination in optical reflectance microscopy, Charles Brookshire¹, Michael Uchic², Victoria Kramb¹, Tyler Lesthaeghe³, and Keigo Hirakawa¹; ¹University of Dayton, ²Air Force Research Laboratory, and ³University of Dayton Research Institute (United States)

11:10**COIMG-357**

Skin chromophore estimation from mobile selfie images using constrained independent component analysis, Raja Bala¹, Luisa Polania², Ankur Purwar³, Paul Matts⁴, and Martin Maltz⁵; ¹Palo Alto

Research Center (United States),²Target Corporation (United States),³Procter & Gamble (Singapore),⁴Procter & Gamble (United Kingdom), and⁵Xerox Corporation (United States)

11:30

COIMG-358

Computational imaging: Algorithm/hardware co-design considerations, *Sergio Goma, Qualcomm Inc. (United States)*

11:50

COIMG-359

Statistical inversion methods in mobile imaging, *Hasib Siddiqui, Qualcomm Technologies Inc. (United States)*

12:30 – 2:00 PM Lunch

Computer Vision I

Session Chair: Robert Stevenson, University of Notre Dame (United States)

2:00 – 3:00 PM

Grand Peninsula B/C

2:00

COIMG-377

Efficient multilevel architecture for depth estimation from a single image, *Nilesh Pandey, Bruno Artacho, and Andreas Savakis, Rochester Institute of Technology (United States)*

2:20

COIMG-378

Sky segmentation for enhanced depth reconstruction and Bokeh rendering with efficient architectures, *Tyler Nuanes^{1,2}, Matt Elsey², Radek Grzeszczuk², and John Shen¹; ¹Carnegie Mellon University and ²Light (United States)*

2:40

COIMG-379

A dataset for deep image deblurring aided by inertial sensor data, *Shuang Zhang, Ada Zhen, and Robert Stevenson, University of Notre Dame (United States)*

3:00 – 3:30 PM Coffee Break

Computer Vision II

Session Chair: Robert Stevenson, University of Notre Dame (United States)

3:30 – 4:30 PM

Grand Peninsula B/C

3:30

COIMG-390

On the distinction between phase images and two-view light field for PDAF of mobile imaging, *Chi-Jui (Jerry) Ho and Homer Chen, National Taiwan University (Taiwan)*

3:50

COIMG-391

Indoor layout estimation by 2D LiDAR and camera fusion, *Jieyu Li and Robert Stevenson, University of Notre Dame (United States)*

4:10

COIMG-392

Senscape: Modeling and presentation of uncertainty in fused sensor data live image streams, *Henry Dietz and Paul Eberhart, University of Kentucky (United States)*



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