IS&T International Symposium on

Electronic Imaging

SCIENCE AND TECHNOLOGY

29 January 2017 – 2 February 2017 • Burlingame, CA, USA

Image Processing: Algorithms and Systems XV

Editors: **Sos S. Agaian,** The Univ. of Texas at San Antonio (United States),
Karen 0. Egiazarian, Tampere Univ. of Technology (Finland),
Atanas P. Gotchev, Tampere Univ. of Technology (Finland)

Image Processing: Algorithms and Systems XV

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Image Processing: Algorithms and Systems XV

Tuesday, January 31, 2017

Transform-domain Image Processing

Session Chair: Karen Egiazarian, Tampere University of Technology (Finland)

8:50 – 10:10 am
Cypress B

8:50   5
Compressed sensing MRI using curvelet sparsity and nonlocal total variation: CS-NLTV, *Ali Pour Yazdanpanah and Emma E. Regentova, University of Nevada (United States)* (IPAS-197)

9:10   10
Brand detection framework in LG wavelet domain, *Federica Mangiatordi, Andrea Bernardini, Emiliano Pallotti, and Licia Capodiferro, Fondazione Ugo Bordoni (Italy)* (IPAS-198)

9:30   16
Texture representations in different basis functions for image synthesis using system criteria analysis, *Viacheslav Voronin[1], Vladimir Ryzhov[2], Vladimir Marchuk[1], and Sergey Makov[1]; [1]Don State Technical University, and [2]Southern Federal University (Russian Federation)* (IPAS-199)

9:50   21
2-D octonion discrete fourier transform: Fast algorithms, *Artyom Grigoryan and Sos Agaian, University of Texas at San Antonio (United States)* (IPAS-200)

10:00 AM – 7:30 pm   Industry Exhibition
10:10 – 10:50 am   Coffee Break

Image Processing Algorithms

Session Chair: Karen Egiazarian, Tampere University of Technology (Finland)

10:50 am – 11:50 am
Cypress B

10:50   27
Full-reference metrics multidistortional analysis, *Oleg Ieremeiev[1], Vladimir Lukin[1], Nikolay Ponomarenko[1], and Karen Egiazarian[2]; [1]National Aerospace University (Ukraine) and [2]Tampere University of Technology (Finland)* (IPAS-202)

11:10   36
ICA-based background subtraction method for an FPGA-SoC, *Fernando Carrizosa-Corral, Alberto Vázquez-Cervantes, Josué Montes Martínez, Teresa Hernández-Díaz, Leonardo Barriga-Rodríguez, Jorge Soto-Cajiga, and Hugo Jimenez; Centro de Ingeniería y Desarrollo Industrial (Mexico)* (IPAS-203)

11:30   42
A robust line segmentation for Arabic printed text with diacritics, *Muna Ayesh[1], Khader Mohammad[1], Aziz Qaroush[1], Sos Agaian[2], and Mahdi Washha[3]; [1]Birzeit University (Palestine), [2]University of Texas (United States), and [3]University of Toulouse (France)* (IPAS-204)

11:50 – 2:00 pm   Lunch Break

EI 2017 Tuesday Plenary and Symposium Awards

Session Chairs: Joyce E. Farrell, Stanford University, and Nitin Sampat, Rochester Institute of Technology (United States)
2:00 – 3:00 pm
Grand Peninsula Ballroom D

VR 2.0: Making virtual reality better than reality, *Gordon Wetzstein, Stanford University (United States)*

Gordon Wetzstein is an Assistant Professor of Electrical Engineering and, by courtesy, of Computer Science, at Stanford University, and leads the Stanford Computational Imaging Group. He received a PhD in computer science from the University of British Columbia (2011) where his doctoral dissertation focused on computational light modulation for image acquisition and display. In his talk, Wetzstein explores the frontiers of VR systems engineering. Eventually, VR/AR systems will redefine communication, entertainment, education, collaborative work, simulation, training, telesurgery, and basic vision research, as next-generation computational near-eye displays evolve to deliver visual experiences that are better than the real world.

3:00 – 3:30 pm   Coffee Break

Image Interpolation, Restoration, and Denoising `Joint Session`

Session Chairs: Karen Egiazarian, Tampere University of Technology (Finland), and Radka Tezaur, Intel Corporation (United States)

3:30 – 5:30 pm
Grand Peninsula Ballroom A

This session is jointly sponsored by: Digital Photography and Mobile Imaging XIII and Image Processing: Algorithms and Systems XV.

3:30   48
BM3D-HVS: Content-adaptive denoising for improved visual quality (Invited), *Karen Egiazarian[1,2], Aram Danielyan[2], Nikolay Ponomarenko[1,2], Alessandro Foi[1,2], Oleg Ieremeiev[3], and Vladimir Lukin[3]; [1]Tampere University of Technology (Finland), [2]Noiseless Imaging Oy (Finland), and [3]National Aerospace University (Ukraine)* (DPMI-083)

3:50   56
Refining raw pixel values using a value error model to drive texture synthesis, *Henry Dietz, University of Kentucky (United States)* (IPAS-084)

4:10   67
Color interpolation based on colorization for RGB-white color filter array, *Paul Oh[1], Sukho Lee[2], and Moon Gi Kang[1]; [1]Yonsei University and [2]Dongseo University (Republic of Korea)* (IPAS-085)

4:30   72
Video frame synthesizing method for HDR video capturing system with four image sensors, *Takayuki Yamashita[1,2] and Yoshihiro Fujita[1]; [1]Ehime University and [2]NHK (Japan)* (IPAS-086)

4:50
Robust defect pixel detection and correction for Bayer Imaging Systems, *Noha El-Yamany, Intel Corporation (Finland)* (DPMI-088)

Symposium Demonstration Session
5:30 – 7:30 pm
Grand Peninsula Ballroom E

Wednesday, February 1, 2017

Image Processing Applications

Session Chair: Sos Agaian, University of Texas at San Antonio (United States)

8:50 – 10:10 am
Cypress B

8:50   78

Water region extraction in thermal and RGB sequences using spatiotemporally-oriented energy features, *Amir Ghahremani, Egor Bondarev, and Peter De With, Eindhoven University of Technology (the Netherlands)* (IPAS-205)

9:10   87

Cloud and shadow detection using sequential characteristics on multi-spectral satellite images, *Herman Groot[1], Arjen Oostdijk[2], Mark van Persie[2], and Peter De With[1]; [1]Eindhoven University of Technology and [2]Netherlands Aerospace Centre (the Netherlands)* (IPAS-206)

9:30   95

Thermal facial signatures for state assessment during deception, *Nilesh Powar[1], Tamera Schneider[2], Julie Skipper[2], Douglas Petkie[2], Vijayan Asari[1], Rebecca Riffle[2], Matthew Sherwood[2], and Carl Cross[2]; [1]University of Dayton and [2]Wright State University (United States)* (IPAS-207)

9:50   105

Face spoofing detection based on local binary descriptors, *Yao-Hong Tsai and Yu-Jung Lin, Hsuan Chung University (Taiwan)* (IPAS-208)

10:00 am – 4:00 pm   Industry Exhibition

10:10 – 10:50 am   Coffee Break

3D Sensing and Processing

Session Chair: Atanas Gotchev, Tampere University of Technology (Finland)

10:50 – 11:30 am
Cypress B

10:50   109

Real-time estimation of the 3D transformation between images with large viewpoint differences in cluttered environments, *Dennis van de Wouw[1,2], Martin Pieck[1], Gijs Dubbelman[1], and Peter De With[1]; [1]Eindhoven University of Technology and [2]Vinotion B.V. (the Netherlands)* (IPAS-209)

11:10   117

Camera-to-model back-raycasting for extraction of RGB-D images from pointclouds, *Hani Javan Hemma, Egor Bondarev, and Peter De With; Eindhoven University of Technology (the Netherlands)* (IPAS-210)

11:30 am – 2:00 pm   Lunch Break

EI 2017 Wednesday Plenary and Symposium Awards

Session Chairs: Joyce E. Farrell, Stanford University, and Nitin Sampat, Rochester Institute of Technology (United States)
2:00 – 3:00 pm
Grand Peninsula Ballroom D

Designing VR video camera systems, *Brian Cabral, Facebook, Inc. (United States)*

Brian Cabral is Director of Engineering at Facebook, leading the Surround 360 VR camera team, specializing in computational photography, computer vision, and computer graphics. He has published a number of papers in the area of computer graphics and imaging including the pioneering Line Integral Convolution algorithm. Cabral discusses developing Facebook Surround 360, an open, high-quality 3D-360 video capture system. VR video capture systems are composed of multiple optical and digital components - all of which must operate as if they are one seamless optical system. The design of VR video cameras, optical choices, SNR, etc., require a new set of technologies and engineering approaches, with tight coupling to the computational system components.

3:00 – 3:30 pm   Coffee Break

Image Processing: Algorithms and Systems Interactive Papers Session

5:30 – 7:00 pm
Atrium
The following works will be presented at the EI 2017 Symposium Interactive Papers Session.

125

Non-blind image deconvolution using sampling without replacement, *Jaeduk Han, Jonghyun Kim, and Moon Gi Kang, Yonsei University (Republic of Korea)* (IPAS-214)

131

Alpha-rooting method of gray-scale image enhancement in the quaternion frequency domain, *Artyom Grigoryan and Sos Agaian, University of Texas at San Antonio (United States)* (IPAS-215)

143

What makes HDR the contents more realistic? Peak-luminance enhancement using the loading effect for OLED displays, *Jihwan Woo and Seoyoung Lee, Samsung Electronics (Republic of Korea)* (IPAS-217)

149

Feature representation learning by sparse neural network for multi-camera person re-identification, *Sergey Makov, Alexandr Minaev, Anton Nikitin, Viacheslav Voronin, Evgeny Semenishchev, and Vladimir Marchuk, Don State Technical University (Russian Federation)* (IPAS-211)

156

Search the optimal border for combination of image pairs using neural networks, *Evgeny Semenishchev, Viacheslav Voronin, Vladimir Marchuk, and Irina Tolstova, Don State Technical University (Russian Federation)* (IPAS-087)