IS&T International Symposium on Electronic Imaging Science and Technology 2017

Color Imaging XXII: Displaying, Processing, Hardcopy, and Applications

Burlingame, California, USA
29 January - 2 February 2017

Editors:

Reiner Eschbach
Gabriel G. Marcu
Alessandro Rizzi

Color Imaging XXII: Displaying, Processing, Hardcopy, and Applications

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Joyce Farrell, Stanford University (United States)

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Monday January 30, 2017

EI 2017 Opening 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
Giga-scale 3D computational microscopy, *Laura Waller, University of California, Berkeley (United States)*
Laura Waller is the Ted Van Duzer Endowed Assistant Professor of Electrical Engineering and Computer Sciences (EECS) at UC Berkeley. She is a Senior Fellow at the Berkeley Institute of Data Science, and received her BS (2004), MEng (2005), and PhD (2010) in EECS from the Massachusetts Institute of Technology (MIT). Waller's talk is on computational imaging methods for fast capture of gigapixel-scale 3D intensity and phase images in a commercial microscope that employs illumination-side and detection-side coding of angle (Fourier) space with simple hardware and fast acquisition. The result is high-resolution reconstructions across a large field-of-view, achieving high space-bandwith-time product.

3:00 – 3:30 PM Coffee Break

Surface Appearance Modeling and Reproduction Joint Session

Session Chair: Francisco Imai, Canon U.S.A. Inc. (United States)

3:30 – 4:50 PM
Regency Ballroom C
This session is jointly sponsored by: Material Appearance 2017 and Color Imaging XXII: Displaying, Processing, Hardcopy, and Applications.

3:30
Modeling and reproducing effect paints, *Gary Meyer and Avery Musbach, University of Minnesota (United States)* [MAAP-288]

3:50
How to design a recto-verso print displaying different images in various everyday-life lighting conditions, *Nicolas Dalloz[1,2], Serge Mazauric[1,3], Mathieu Hebert[1], and Thierry Fournel[1]; [1]University of Lyon, UJM-Saint-Etienne, CNRS, Institut d'Optique Graduate School, [2]Institut d'Optique Graduate School, and [3]CPE Lyon (France)* [MAAP-289]

4:10
Appearance decomposition and reconstruction of textured fluorescent objects, *Shoji Tominaga, Keiji Kato, Keita Hirai, and Takahiko Horiuchi, Chiba University (Japan)* [MAAP-290]

4:30
Assessing the proper color of translucent materials by an extended two-flux model from measurements based on an integrating sphere, *Lionel Simonot[1], Mathieu Hebert[2], Serge Mazauric[2,3], and Roger Hersch[4]; [1]Université de Poitiers (France), [2]Université Jean Monnet de Saint Etienne (France), [3]CPE Lyon, Domaine Scientifique de la Doua (France), and [4]École Polytechnique Fédérale de Lausanne (Switzerland)* [MAAP-291]

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

Tuesday January 31, 2017

7:15 – 8:45 AM Women in Electronic Imaging Breakfast

Color Management

Session Chair: Sophie Triantaphillidou, University of Westminster (United Kingdom)

8:50 – 9:50 AM
Regency Ballroom C

8:50
Wide-gamut mobile-device displays: Gamut-mapping and color enhancement challenges, *Reza Safaee-Rad[1] and Jennifer Gille[2], [1]Qualcomm (Canada) and [2]Qualcomm Technologies, Inc. (United States)* [COLOR-026]

9:10
Methods of describing a gamut boundary based on a face/vertex encoding, *Phil Green[1], Kiran Deshpande[2], Frans Gaykema[3], and W. Craig Revie[4]; [1]Norwegian University of Science and Technology (Norway), [2]Multi Packaging Solutions (United Kingdom), [3]Océ Technologies (the Netherlands), and [4]FFEI (United Kingdom)* [COLOR-027]

9:30
Gamut mapping in RGB colour spaces with the iterative ratios diffusion algorithm, *Carlo Gatta[1] and Ivar Farup[2]; [1]Computer Vision Center (Spain) and [2]Norwegian University of Science and Technology (Norway)* [COLOR-028]

Color Vision and Deficiency

Session Chair: Sophie Triantaphillidou, University of Westminster (United Kingdom)

9:50 – 10:30 AM
Regency Ballroom C

9:50
Checklist for daltonization methods: Requirements and characteristics of a good recoloring method, *Joschua Simon-Liedtke[1], David Flatla[2], and Eskild Bakken[1]; [1]Norwegian University of Science and Technology (Norway) and [2]University of Dundee (United Kingdom)* [COLOR-029]

10:10
On the edge: A scalable daltonization method focusing chromatic edges and contrast, *Joschua Simon-Liedtke[1], Ivar Farup[1], and Reiner Eschbach[1,2]; [1]Norwegian University of Science and Technology (Norway) and [2]Monroe Community College (United States)* [COLOR-030]

10:00 AM – 7:30 PM Industry Exhibition

10:30 – 10:50 AM Coffee Break

Color Vision and Deficiency (cont.)

Session Chair: Alessandro Rizzi, Università degli Studi di Milano (Italy)

10:50 – 11:50 AM
Regency Ballroom C

10:50
Estimating appearance differences of 3D objects with an RGB camera, *Pei-Li Sun, National Taiwan University of Science and Technology (Taiwan)* [COLOR-033]

11:10
A metric for the evaluation of color perceptual smoothness, *Cedric Marchessoux and Johan Rostang, Barco N.V. (Belgium)* [COLOR-034]

11:30
Towards a perceptually-motivated color space for high dynamic range imaging, *Mekides Abebe[1,2], Tania Pouli[1], and Mohammed Chaker Larabi[2]; [1]Technicolor (France) and [2]Université de Poitiers (France)* [COLOR-035

11:50 AM – 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

Display and Display Appearance

Session Chair: Fritz Lebowsky, STMicroelectronics (France)

3:30 – 5:10 PM
Regency Ballroom C

3:30
Color discrimination threshold for medical test devices, *Nargess Hassani and Susan P. Farnand, Rochester Institute of Technology (United States)* [COLOR-036]

3:50
Content-dependent adaptation in a soft proof matching experiment, *Gregory High, Phil Green, and Peter Nussbaum, Norwegian University of Science and Technology (Norway)* [COLOR-037]

4:10

Comparisons of measures of blurriness in transparent displays, *Chang-Mo Yang, Dong-Hyeok Lee, Kyoung-Soo Park, Young-Tae Kim, and Choon-Woo Kim, Inha University (Republic of Korea)* [COLOR-038]

4:30

The smallest projection optics for the vertical shaped ultra short throw projector, *Yohei Takano and Hibiki Tatsuno, Ricoh Co., Ltd. (Japan)* [COLOR-039]

4:50

Pareto Optimal Primary Designs for Color Displays, *Hao Xie, Carlos Rodriguez-Pardo, and Gaurav Sharma, University of Rochester (United States)* [COLOR-040]

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

Wednesday February 1, 2017

Halftoning and Printing I

Session Chair: Reiner Eschbach, Norwegian University of Science and Technology (Norway) and Monroe Community College (United States)

8:50 – 10:10 AM
Regency Ballroom C

8:50

Color halftoning based on Neugebauer Primary Area Coverage, *Wanling Jiang[1], Weijuan Xi[1], Utpal Sarkar[2], Robert Ulichney[3], and Jan Allebach[1]; [1]Purdue University [2]Hewlett-Packard Barcelona (Spain), and [3]Hewlett-Packard Laboratories, HP Inc. (United States)* [COLOR-041]

9:10

Color halftoning based on multi-stage, multi-pass, clustered-DBS, *Weijuan Xi[1], Tal Frank[2], Ben-Shoshan Yotam[2], Robert Ulichney[3], and Jan Allebach[1]; [1]Purdue University [2]Hewlett-Packard Indigo Division (Israel), and [3]Hewlett-Packard Laboratories, HP Inc. (United States)* [COLOR-042]

9:30

On large local error accumulation in multilevel error diffusion (JIST-first), *Reiner Eschbach[1,2] and Marius Pedersen[1]; [1]Norwegian University of Science and Technology (Norway) and [2]Monroe Community College (United States)* [COLOR-043]

9:50

Edge-preserving error diffusion for multi-toning based on dual quantization, *Takuma Kiyotomo[1], Keisuke Hoshino[2], Yuki Tsukano[2], Hiroki Kibushi[2], and Takahiko Horiuchi[1]; [1]Chiba University and [2]Tokyo Kikai Seisakusho, Ltd. (Japan)* [COLOR-044]

10:00 AM – 4:00 PM Industry Exhibition

10:10 – 10:50 AM Coffee Break

Halftoning and Printing II

Session Chair: Robert Ulichney, HP Labs, HP Inc. (United States)

10:50 AM – 12:10 PM
Regency Ballroom C

10:50

Selecting best ink color for sparse watermark, *Alastair Reed[1], Kristyn Falkenstern[1], and Edward Hattenberger[2]; [1]Digimarc Corporation and [2]X-Rite Inc. (United States)* [COLOR-045]

11:10

Page classification for print imaging pipeline, *Shaoyuan Xu[1], Cheng Lu[1], Mark Shaw[2], Peter Bauer[2], and Jan Allebach[1]; [1]Purdue University and [2]HP Inc. (United States)* [COLOR-046]

11:30

Indirect periodic disturbance compensator using feedforward control for image noises, *Satoshi Kaneko, Ricoh Company, Ltd. (Japan)* [COLOR-047]

11:50

3D halftoning, *Ruiyi Mao[1], Utpal Sarkar[2], Robert Ulichney[3], and Jan Allebach[1]; [1]Purdue University (United States), [2]HP Inc. (Spain), and [3]HP Labs (United States)* [COLOR-048]

12:10 – 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

Dark Side of Color

Session Chair: Alessandro Rizzi, Università degli Studi di Milano (Italy)

3:30 – 5:10 PM
Regency Ballroom C

3:30
What makes hue special?, *Ivar Farup, Norwegian University of Science and Technology (Norway)* [COLOR-049]

3:50
Revealing the Dark Ages - Imaging erased manuscripts, *Keith Knox[1] and Roger Easton[2]; [1]Knox Consulting and [2]Rochester Institute of Technology (United States)* [COLOR-050]

4:10
Image quality for visually impaired?, *Sophie Triantaphillidou, University of Westminster (United Kingdom)* [COLOR-051]

4:30
Lights, camera, metameric failure, *Joshua Pines, Technicolor (United States)* [COLOR-052]

4:50
What we see and what we know: Partners in human vision, *John McCann, McCann Imaging (United States)* [COLOR-053]

5:30 – 7:00 PM Symposium Interactive Papers (Poster) Session, Grand Peninsula Ballroom E

Thursday February 2, 2017

Color Image Processing

Session Chair: Gabriel Marcu, Apple Inc. (United States)

8:50 – 10:10 AM
Regency Ballroom C

8:50
Extraordinary perceptual color stability in low cost, real time color image compression inspired by structure tensor analysis, *Fritz Lebowsky and Mariano Bona, STMicroelectronics (France)* [COLOR-054]

9:10
Sky color enhancement of photographic images, *Huanzhao Zeng, Google Inc. (United States)* [COLOR-055]

9:30
A novel colour hessian and its applications, *Saman Tahery and Mark Drew, Simon Fraser University (Canada)* [COLOR-056]

9:50
A color image model with applications to denoising, *Megan Fuller and Jae S. Lim, Massachusetts Institute of Technology (United States)* [COLOR-057]

10:10 – 10:50 AM Coffee Break

Spectral Selection and Separation

Session Chair: Marius Pedersen, Norwegian University of Science and Technology (Norway)

10:50 AM – 12:10 PM
Regency Ballroom C

10:50
Addressing the colorimetric redundancy in 11-ink color separation, *Daniel Nyström, Paula Zitinski Elias, and Sasan Gooran, Linköping University (Sweden)*

11:10
Spectral band selection using a genetic algorithm based wiener filter estimation method for reconstruction of munsell spectral data, *Keivan Ansari[1,2], Jean- Baptiste Thomas[1], and Pierre Gouton[1], [1]University de Bourgogne (France) and [2]Institute for Color Science and Technology (Iran)*

11:30
Illumination and reflectance spectra separation of hyperspectral image data under multiple illumination conditions, *Xiaochuan Chen, Mark S. Drew, and Ze-Nian Li, Simon Fraser University (Canada)*

11:50
Multispectral face recognition using hybrid feature, *Mamadou Diarra[1,2], Pierre Gouton[1], and Jerome Kablan Adou[2]; [1]University de Bourgogne (France) and [2]Université Félix Houphouet Boigny (Côte d'Ivoire)*

12:10 – 2:00 PM Lunch Break

Interactive Workshop: How can COLOR imaging provide US with powerful INSIGHTS? `Joint Session`

Moderator: Fritz Lebowsky, STMicroelectronics (France)

2:00 – 3:30 PM
Regency Ballroom C
This session is jointly sponsored by: Color Imaging XXII: Displaying, Processing, Hardcopy, and Applications and Material Appearance 2017.

We would very much like to have you participate in a special session in which we encourage asking questions and exchange ideas that frequently trouble us during research and development projects. The presence of experts in COLOR imaging and perhaps Electronic Imaging at large will provide a unique opportunity of efficiently and lively sharing simple/stupefying ideas enabling fascinating engineering concepts which may also stimulate your own future research and development projects!

Interactive Workshop: How can color imaging provide us with powerful insights?, *Fritz Lebowsky, STMicroelectronics (France)*

3:00 – 5:00 PM Meet the Future: A Showcase of Student and Young Professionals Research, Grand Peninsula Ballroom E

3:20 – 4:00 PM Coffee Break

Interactive Workshop: How can COLOR imaging provide US with powerful INSIGHTS? (cont.) Joint Session

Moderator: Fritz Lebowsky, STMicroelectronics (France)

4:00 – 5:00 PM
Regency Ballroom C
This continuing workshop session is jointly sponsored by: Color Imaging XXII: Displaying, Processing, Hardcopy, and Applications, and Material Appearance 2017.