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Stereoscopic Displays and Applications XXVIII

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Stereoscopic Displays and Applications XXVIII

Monday, January 30, 2017

Stereoscopic Human Factors and Applications

Session Chair: Takashi Kawai, Waseda University (Japan)

8:50 – 10:20 am
Grand Peninsula Ballroom D

8:50
Expert viewers' preferences for higher frame rate 3D film (JIST-first),
Robert Allison[1], Laurie Wilcox[2], Roy Anthony[3], John Helliker[4], and Bert Dunk[4]; [1]York University, [2]Centre for Vision Research, York University, [3]Christie Digital, and [4]Sheridan College (Canada) [SD&A-353]

9:10
Investigating aircrew depth perception standards using a stereoscopic simulation environment, *Marc Winterbottom[1], Charles Lloyd[2], James Gaska[1], Logan Williams[1], Elizabeth Shoda[3], and Steven Hadley[1]; [1]U.S. Air Force School of Aerospace Medicine, [2]Visual Performance LLC, and [3]KBRwyle (United States)* [SD&A-354]

9:30
Estimation of altitude in stereoscopic-3D versus 2D real-world scenes,
Lesley Deas[1], Robert Allison[1], Brittney Hartle[1], Elizabeth Irving[2], Mackenzie Glaholt[3], and Laurie Wilcox[1]; [1]York University, [2]University of Waterloo, and [3]Defence Research and Development Canada (Canada) [SD&A-355]

9:50
Study of objective parameters of 3D visual fatigue based on analysis of salient area, *Minghan Du, Yue Liu, Yongtian Wang, and Bochao Zou, Beijing Institute of Technology (China)* [SD&A-356]

10:10
SD&A Opening Remarks, *Andrew Woods, Curtin University (Australia)*

10:20 – 10:50 am   Coffee Break

Autostereoscopic Displays I

Session Chair: Gregg Favalora, Draper (United States)

10:50 am – 12:10 pm
Grand Peninsula Ballroom D

10:50
Architectures and codecs for real-time light field streaming (JIST-first),
Péter Kovács[1,2], Alireza Zare[1,3], Tibor Balogh[2], Robert Bregovic[1], and Atanas Gotchev[1]; [1]Tampere University of Technology (Finland), [2]Holografika (Hungary), and [3]Nokia Technologies (Finland) [SD&A-357]

11:10
Wide viewing angle projection-type integral 3D display system with multiple UHD projectors, *Hayato Watanabe, Masahiro Kawakita, Naoto Okaichi, Hisayuki Sasaki, Masanori Kano, Jun Arai, and Tomoyuki Mishina, Science and Technology Research Laboratories, NHK (Japan Broadcasting Corporation) (Japan)* [SD&A-358]

11:30
Multilevel light modulation of three-dimensional magneto-optic spatial light modulator using optically addressing method, *Kazuki Nakamura[1], Kazuki Yamazaki[1], Hiroyuki Takagi[1], Taichi Goto[1,2], Pang Boey Lim[1], Hironaga Uchida[1], and Mitsuteru Inoue[1]; [1]Toyohashi University of Technology and [2]JST PRESTO (Japan)* [SD&A-360]

11:50
Integral three-dimensional display with high image quality using multiple flat-panel displays, *Naoto Okaichi, Hayato Watanabe, Hisayuki Sasaki, Jun Arai, Masahiro Kawakita, and Tomoyuki Mishina, Science and Technology Research Laboratories, NHK (Japan Broadcasting Corporation) (Japan)* [SD&A-361]

12:10 – 2:00 pm   Lunch Break

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

SD&A Keynote I
Session Chair: Andrew Woods, Curtin University (Australia)
3:30 – 4:30 pm
Grand Peninsula Ballroom D

Stereoscopic displays, tracking, interaction, education, and the web,
David Chavez, zSpace, Inc. (United States) [SD&A-362]

David Chavez brings 20 years of experience in start-up companies, working with technologies ranging from GSM infrastructure to laptops, printers, PDAs and smartphones, in both consumer and commercial product spaces. He has managed product development teams through the full range of the product life cycle, from initial concept to volume production. Chavez has extensive experience working with suppliers and manufacturing partners worldwide, with a particular emphasis in Asia. He has held various positions in product development organizations such as pen-based computer companies GO & EO, Hewlett Packard, and Handspring.

Symposium Welcome Reception
5:00 – 6:00 pm
Atrium

SD&A Conference 3D Theater

Session Chairs: John Stern, Intuitive Surgical, Inc. (United States), Chris Ward, Lightspeed Design, Inc. (United States), and Andrew Woods, Curtin University (Australia)

6:00 – 7:30 pm
Grand Peninsula Ballroom D

This ever-popular session of each year's Stereoscopic Displays and Applications Conference showcases the wide variety of 3D content that is being produced and exhibited around the world. All 3D footage screened in the 3D Theater Session is shown in high-quality polarized 3D on a large screen. The final program will be announced at the conference and 3D glasses will be provided.

Tuesday, January 31, 2017

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

Human Vision and Stereoscopic Imaging Joint Session

Session Chairs: Nicolas Holliman, University of Newcastle (United Kingdom), and Thrasyvoulos Pappas, Northwestern University (United States)

8:50 – 10:10 am
Grand Peninsula Ballroom D

This session is jointly sponsored by: Stereoscopic Displays and Applications XXVIII and Human Vision and Electronic Imaging 2017.

8:50
Depth-compressed expression for providing natural, visual experiences with integral 3D displays, *Yasuhito Sawahata and Toshiya Morita, Japan Broadcasting Corporation (Japan)* [HVEI-378]

9:10
Blind quality prediction of stereoscopic 3D images, *Jiheng Wang[1], Qingbo Wu[2], Abdul Rehman[1], Shiqi Wang[1], and Zhou Wang[1]; [1]University of Waterloo (Canada) and [2]University of Electronic Science and Technology of China (China)* [HVEI-379]

9:30
Pseudo-haptic by stereoscopic images and effects on muscular activity, *Takashi Kawai[1], Fumiya Ohta[1], Sanghyun Kim[1], and Hiroyuki Morikawa[1,2]; [1]Waseda University and [2]Aoyama Gakuin University (Japan)* [SD&A-380]

9:50
The effects of proximity cues on visual comfort when viewing stereoscopic content (JIST-first), *Yaohua Xie[1], Danli Wang[1], and Heng Qiao[2]; [1]Institute of Software, Chinese Academy of Sciences, and [2]Department of Economics at the Center University of Finance and Economics (China)* [SD&A-381]

10:00 am – 7:30 pm   Industry Exhibition

10:10 – 10:50 am   Coffee Break

Autostereoscopic Displays II

Session Chair: Michael Klug, Magic Leap, Inc. (United States)

10:50 am – 12:30 pm
Grand Peninsula Ballroom D

10:50
See-through projection 3D display using time-division multiplexing, *Masahiro Kajimoto, Hiroki Kamoshita, and Tomohiro Yendo, Nagaoka University of Technology (Japan)* [SD&A-363]

11:10
Flat autostereoscopic 3D display with enhanced resolution using a static color filter barrier, *Silvio Jurk, Mathias Kuhlmey, Roland Bartmann, Bernd Duckstein, and René de la Barré, Fraunhofer Heinrich-Hertz-Institute (Germany)* [SD&A-364]

11:30
Portrait and landscape mode convertible stereoscopic display using parallax barrier, *Yusuke Minami, Goro Hamagishi, Kayo Yoshimoto, and Hideya Takahashi, Osaka City University (Japan)* [SD&A-365]

11:50
Digital holographic display with two-dimensional and three-dimensional convertible feature by high speed switchable diffuser, *Keehoon Hong, Yongjun Lim, Hayan Kim, Kwan-Jung Oh, and Hyon-Gon Choo, Electronics and Telecommunications Research Institute (Republic of Korea)* [SD&A-366]

12:10
A low-cost static volumetric display based on layered high incidence angle scattering, *Shawn Frayne, Looking Glass Factory, Inc. (United States)* [SD&A-382]

12:30 – 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

Stereo-cameras and Stereo-matching

Session Chair: Neil Dodgson, University of Cambridge (United Kingdom)

3:30 – 4:30 pm
Grand Peninsula Ballroom D

3:30
Real-time depth estimation method using hybrid camera system, *Eu-Tteum Baek and Yo-Sung Ho, Gwangju Institute of Science and Technology (Republic of Korea)* [SD&A-367]

3:50
Pixel-based adaptive normalized cross correlation for illumination invariant stereo matching, *Yong-Jun Chang and Yo-Sung Ho, Gwangju Institute of Science and Technology (Republic of Korea)* [SD&A-368]

4:10
Guided image filtering based disparity range control in stereo vision, *Ji-Hun Mun and Yo-Sung Ho, Gwangju Institute of Science and Technology (Republic of Korea)* [SD&A-369]

DISCUSSION: SD&A Forum

Moderator: Neil Dodgson, University of Cambridge (United Kingdom)

4:30 – 5:30 pm
Grand Peninsula Ballroom D

This session is a chance for a hot topic to be discussed by a panel of distinguished guests. Topic and panelists to be announced.

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

Wednesday, February 1, 2017

Stereoscopic Image Quality

Session Chair: Björn Sommer, University of Konstanz (Germany)

8:50 – 10:10 am
Grand Peninsula Ballroom D

8:50
Sharpness mismatch and 6 other stereoscopic artifacts measured on 10 Chinese S3D movies, *Dmitriy Vatolin and Alexander Bokov, Lomonosov Moscow State University (Russian Federation)* [SD&A-340]

9:10
Bringing 3DMap to the 21st century, *Stephan Keith[1] and Andrew Woods[2]; [1]Independent Consultant (United States) and [2]Curtin University (Australia)* [SD&A-370]

9:30
Subjective and objective study of the relation between 3D and 2D views based on depth and bit rate, *Balasubramanyam Appina, Manasa K, and Sumohana S. Channappayya, IIT Hyderabad (India)* [SD&A-371]

9:50
Improved depth of field analysis of multilayer displays, *Hironobu Gotoda, National Institute of Informatics (Japan)* [SD&A-373]

10:00 am – 4:00 pm   Industry Exhibition

10:10 – 10:50 am   Coffee Break

3D Developments

Session Chair: Takashi Kawai, Waseda University (Japan)

10:50 – 11:30 am
Grand Peninsula Ballroom D

10:50
Stereo rendering of photorealistic precipitation, *Syed Hussain and David McAllister, North Carolina State University (United States)* [SD&A-374]

11:10
Utilization of stereoscopic 3D images in elementary school social studies classes, *Takashi Shibata[1], Yoshiki Ishihara[1], Kazunori Sato[2,3], and Ryohei Ikejiri[4]; [1]Tokyo University of Social Welfare, [2]Takaido-higashi Elementary School, [3]Tohoku University, and [4]The University of Tokyo (Japan)* [SD&A-372]

SD&A Keynote II
Session Chair: Gregg Favalora, Draper (United States)
11:30 am – 12:30 pm
Grand Peninsula Ballroom D

360° 3D capture: Meeting the need in VR, *Timothy Macmillan and David Newman[2]; [1]Consultant and [2]GoPro Inc. (United States)* [SD&A-375]

Tim MacMillan is an award-winning photographic artist whose career with Camera Array systems began in the 1980's. In the 1990's he established Time-Slice Films Ltd. to produce content and innovate array technology for clients such as the BBC, Sky TV, Discovery Channel, and many others. His distinctive approach has been influential in the development of special effects widely used today. MacMillan's work spans both the artistic and technical, with his early camera technology now in the (United Kingdom) Science Museum. As well as architecting and designing Array systems, he has also worked in HD Broadcast Product Development with Grass Valley Cameras, and is currently Senior Manager of Advanced Products at GoPro Cameras.

12:30 – 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

Visualization Facilities `Joint Session`

Session Chairs: Margaret Dolinsky, Indiana University (United States), and Andrew Woods, Curtin University (Australia)

3:30 – 5:40 pm
Grand Peninsula Ballroom D

This session is jointly sponsored by: Stereoscopic Displays and Applications XXVIII and The Engineering Reality of Virtual Reality 2017.

3:30
Designing a cloud-based 3D visualization engine for smart cities, *Nicolas Holliman, Mark Turner, Stephen Dowsland, Richard Cloete, and Tom Picton, Newcastle University (United Kingdom)* [SD&A-105]

3:50
Interactive computer graphics, stereo and VR practice at the Electronic Visualization Laboratory University of Illinois at Chicago, *Maxine Brown[1], Jason Leigh[2], Tom DeFanti[3], and Daniel Sandin[1]; [1]The University of Illinois at Chicago, [2]University of Hawai'i at Manoa, and [3]University of California, San Diego (United States)* [SD&A-106]

4:10
Designing at the Advanced Visualization Lab at Indiana University, *Margaret Dolinsky[1], Eric Wernert[2], Michael Boyles[2], and Chris Eller[2]; [1]School of Art and Design, Indiana University and [2]Advanced Visualization Lab, Indiana University (United States)* [ERVR-107]

4:30
Exploring Calit2, *Jürgen Schulze and Gregory Dawe, University of California, San Diego (United States)* [ERVR-108]

4:50
3D-Stereoscopic immersive analytics projects at Monash University and University of Konstanz, *Björn Sommer[1,3], David G. Barnes[1,4], Sarah Boyd[1], Thomas Chandler[1], Maxime Cordeil[1], Tobias Czauderna[4], Mathias Klapperstück[4], Karsten Klein[1,3], Toan Nguyen[4], Hieu Nim[1,5], Kingsley Stephens[1], Dany Vohl[2], Stephen Wang[1], Elliott Wilson[1], Yan Zhu[1], Jian Li[1], Jon McCormack[1], Kim Marriott[1], and Falk Schreiber[1,3]; [1]Monash University (Australia), [2]Swinburne University of Technology (Australia), [3]University of Konstanz (Germany), [4]Monash Immersive Visualization Platform at Monash University (Australia), and [5]Australian Regenerative Medicine Institute of Monash University (Australia)* [SD&A-109]

5:10
Image distortions in large-scale immersive display systems – Cylinder and wedge displays, *Andrew Woods[1], Joshua Hollick[1], Jesse Helliwell[1], and Paul Bourke[2]; [1]Curtin University and [2]University of Western Australia (Australia)* [SD&A-110]

5:30
SD&A Closing Remarks, *Nicolas Holliman, Newcastle University (United Kingdom)*

Stereoscopic Displays and Applications XXVIII Interactive Papers Session

5:30 – 7:00 pm
Atrium

The following works will be presented at the EI 2017 Symposium Interactive Papers Session.

Analysis of retinal images for retinal projection type super multi-view 3D head-mounted display, *Takashi Emoto, Tadayuki Konda, Kayo Yoshimoto, and Hideya Takahashi, Osaka City University (Japan)* [SD&A-376]

A new design and image processing algorithm for lenticular lenses displays, *René de la Barré, Roland Bartmann, Mathias Kuhlmey, Bernd Duckstein, Silvio Jurk, and Sylvain Renault, Fraunhofer Heinrich-Hertz-Institute (Germany)* [SD&A-377]