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The Engineering Reality of
Virtual Reality 2017

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Editors:

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The Engineering Reality of Virtual Reality 2017

Wednesday, February 1, 2017

The Real World Meets VR: Case Studies

Session Chairs: Margaret Dolinsky, Indiana University, and Ian McDowall, Intuitive Surgical / Fakespace Labs (United States)

9:10 – 10:10 am

Sandpebble A

9:10 5
Oculus rift with stereo camera for augmented reality medical intubation training, Kyung yul Kevin Lim, Preetham Suresh, and Jürgen Schulze, University of California, San Diego (United States) [ERVR-089]

9:30 11
Virtual reality instructional modules in education based on gaming metaphor, Sharad Sharma and Emmanuel Ossueta, Bowie State University (United States) [ERVR-090]

9:50 19
Soft robotic glove for kinesthetic haptic feedback in virtual reality environments, Saurabh Jadhav, Vikas Kannanda, Bocheng Kang, Michael Tolley, and Jürgen Schulze, University of California, San Diego (United States) [ERVR-102]

10:00 am – 4:00 pm Industry Exhibition

10:10 – 10:50 am Coffee Break

Positioning the Body in VR

Session Chairs: Margaret Dolinsky, Indiana University, and Ian McDowall, Intuitive Surgical / Fakespace Labs (United States)

10:50 am – 12:30 pm

Sandpebble A

10:50 25
The Destiny-class CyberCANOE- a surround screen, stereoscopic, cyber-enabled collaboration analysis navigation and observation environment, Noel Kawano, Ryan Theriot, Jack Lam, Eric Wu, Andrew Guagliardo, Dylan Kobayashi, Alberto Gonzalez, Ken Uchida, and Jason Leigh, University of Hawai'i at Manoa (United States) [ERVR-093]

11:10 31
CAVE versus head-mounted displays: On-going thoughts, Daniel Mestre, CNRS (France) [ERVR-094]

11:30 36
Distributed VR rendering using NVIDIA OptiX, Dylan McCarthy and Jürgen Schulze, University of California, San Diego (United States) [ERVR-095]

11:50 42
Laser illuminated projectors and the technological advancements brought forth to immersive environments, Dirk Reiners¹, Danielle Rose Rains¹, Walter Burgess², and Carolina Cruz-Neira¹; ¹University of Arkansas at Little Rock and ²Power Technology Inc. (United States) [ERVR-096]

12:10

New VR navigation techniques to reduce cybersickness, Andras Kemeny^{1,2}, Paul George¹, Frédéric Mérienne¹, and Florent Colombet²; ¹Arts et Métiers ParisTech and ²Renault (France) [ERVR-097]

48

12:30 – 2:00 pm Lunch Break

El 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, Stephen Dowsland, Mark Turner, 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 Brown¹, Jason Leigh², Tom DeFanti³, and Daniel Sandin¹; ¹The University of Illinois at Chicago, ²University of Hawai'i at Manoa, and ³University of California, San Diego (United States) [SD&A-106]

4:10

Designing at the Advanced Visualization Lab at Indiana University, Margaret Dolinsky¹, Eric Werner², Michael Boyles², and Edward J. Dambik²; ¹School of Art and Design, Indiana University and ²Advanced Visualization Lab, Indiana University (United States) [ERVR-107]

4:30

Exploring Calif2, 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 Boyd¹, Thomas Chandler¹, Maxime Cordeil¹, Karsten Klein^{1,3}, Toan Nguyen⁴, Hieu Nim^{1,5}, Kingsley Stephens¹, Dany Vohl², Elliott Wilson¹, Jon McCormack¹, Kim Marriott¹, and Falk Schreiber^{1,3}; ¹Monash University (Australia), ²Swinburne University of Technology (Australia), ³University of Konstanz (Germany), ⁴Monash Immersive Visualization Platform at Monash University (Australia), and ⁵Australian 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 Woods¹, Joshua Hollick¹, Jesse Hellivell¹, and Paul Bourke²; ¹Curtin University and ²University of Western Australia (Australia) [SD&A-110]

5:30

SD&A Closing Remarks, Nicolas Holliman, Newcastle University (United Kingdom)

Symposium Interactive Papers (Poster) Session
5:30 – 7:00 pm

Atrium

Thursday, February 2, 2017

Keynote: Immersive Visualization Room - Design and Build

Session Chairs: Margaret Dolinsky, Indiana University, and Ian McDowall, Intuitive Surgical / Fakespace Labs (United States)

9:10 – 10:10 am

Sandpebble A

VR journeys from the dark ages to a bright future, Gregory Dawe, University of California, San Diego (United States) [ERVR-098]

Gregory Dawe, the design engineer who made many iterations of CAVE systems possible, will share his perspective on the progression of virtual reality from the first CRT based CAVE system and how it was enhanced during the digital projector era to where we are now with present day flat panel systems. He will discuss the technological quest to improve brightness, resolution and contrast in the crusade to exceed human acuity.

Qlik Introduction

Session Chair: Margaret Dolinsky, Indiana University (United States)

10:10 – 10:30 am

Sandpebble A

The Qlik Environment, Todd Margolis, Qlik (United States) [ERVR-099]

10:30 – 10:50 am Coffee Break

Kit and Kaboodle: VR Gear

Session Chairs: Margaret Dolinsky, Indiana University, and Ian McDowall, Intuitive Surgical / Fakespace Labs (United States)

10:50 am – 11:50 am

Sandpebble A

10:50

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Decoupling of real and digital content in projection-based augmented reality systems using time multiplexed image capture (JIST-first), Shoaib Soomro¹, Erdem Ulusoy¹, and Hakan Urey²; ¹Optical Microsystems Laboratory, Koc University and ²Koç University (Turkey) [ERVR-104]

11:10

60

Exploring body gestures as natural user interface for flying in a virtual reality game with Kinect, Xin Tong, Serkan Pekcetin, Diane Gromala, and Frederico Machuca, Simon Fraser University (Canada) [ERVR-101]

11:30

Drawing towards virtual reality, Margaret Dolinsky, Indiana University (United States) [ERVR-092]

12:30 – 2:00 pm Lunch Break

Qlik Field Trip: Showcase for VR, AR, and Visual Analytics Applications

Host: Todd Margolis, Qlik (United States)

Session Chairs: Margaret Dolinsky, Indiana University, and Ian McDowall, Intuitive Surgical / Fakespace Labs (United States)

2:00 – 5:00 pm

Offsite

Todd Margolis will host the ERVR group at Qlik, located a five minute car ride or 30 min walk from the conference. Sign up in advance at the registration desk. Transportation on your own.