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Material Appearance 2018

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Material Appearance 2018

Monday, January 29, 2018

Keynote: Appearance Issues in Cultural Heritage

Session Chairs: Mathieu Hebert, Université Jean Monnet de Saint Etienne (France) and Ingeborg Tastl, HP Labs, HP Inc. (United States)
10:40 – 11:20 AM

Cypress A

MAAP-122

Material appearance issues: Cultural heritage research, Holly

Rushmeier, Yale University (United States)
Prof. Holly Rushmeier is a professor in the Yale department of computer science. Her research interests include shape and appearance capture, applications of perception in computer graphics, modeling material appearance and developing computational tools for cultural heritage. Prof. Rushmeier received her BS, MS and PhD in mechanical engineering from Cornell University (1977, 1986 and 1988 respectively). Between receiving the BS and returning to graduate school in 1983 she worked as an engineer at the Boeing Commercial Airplane Company and at Washington Natural Gas Company (now a part of Puget Sound Energy). In 1988 she joined the mechanical engineering faculty at Georgia Tech. At the end of 1991, she joined the computing and mathematics staff of the National Institute of Standards and Technology, focusing on scientific data visualization. From 1996 to early 2004, Dr. Rushmeier was a research staff member at the IBM T.J. Watson Research Center. At IBM she worked on a variety of data visualization problems in applications ranging from engineering to finance. She also worked in the area of acquisition of data required for generating realistic computer graphics models, including a project to create a digital model of Michelangelo's Florence Pieta, and the development of a scanning system to capture shape and appearance data for presenting Egyptian cultural artifacts on the World Wide Web.

Surface Appearance Measurement

Session Chair: Lionel Simonot, Institut Pprime (France)

11:20 am – 12:20 pm

Cypress A

11:20

MAAP-150

Diffraction removal in an image-based BRDF measurement setup,

Antoine Lucat^{1,2,3,4}, Ramon Hegedus⁵, and Romain Pacanowski^{1,2,3,4};
¹University de Bordeaux (France), ²CNRS (LP2N) (France), ³Institut d'Optique Graduate School (France), ⁴INRIA (France), and ⁵Department of Cognitive Science (Germany)

11:40

MAAP-151 [no paper]

Morphological characterization of rough surfaces, *Colette Turbil, Iryna Gozhyk, and Ingve Simonsen, SVI UMR 125 CNRS/Saint-Gobain Recherche (France)*

12:00

MAAP-152

Three-dimensional hyperspectral imaging: A new method for human face

acquisition, *Lou Gevaux¹, Cyprien Adne², Pierre Serou², Raphael Clerc¹, Alain Trémeau¹, Jean-Luc Perrot³, and Mathieu Hebert¹;* ¹Univ Lyon, UJM-Saint Etienne, CNRS, Institut d'Optique Graduate School, Laboratoire Hubert Curien, ²Newton Technologies, and ³University Hospital of Saint Etienne (France)

12:20 – 2:00 pm Lunch

Plenary Session

2:00 – 3:00 pm

Grand Peninsula Ballroom D

Overview of Modern Machine Learning and Deep Neural Networks - Impact on Imaging and the Field of Computer Vision,

Greg Corrado, Google, Inc. (United States)

Dr. Greg Corrado, co-founder of Google Brain, principal scientist, and director of augmented intelligence research at Google, provides an overview of modern machine learning and deep neural networks, with particular attention to its impact on imaging and the field of computer vision.

Dr. Corrado is a senior research scientist interested in biological neuroscience, artificial intelligence, and scalable machine learning. He has published in fields ranging across behavioral economics, neuromorphic device physics, systems neuroscience, and deep learning. At Google he has worked for some time on brain inspired computing, and most recently has served as one of the founding members and the co-technical lead of Google's large scale deep neural networks project. Prior to joining Google, Dr. Corrado was a staff research scientist at IBM. He received his MS in computer science and PhD in neuroscience from Stanford University.

3:00 – 3:30 pm Coffee Break

Surface Appearance Modeling and Reproduction JOINT SESSION

Session Chairs: Reiner Eschbach, Norwegian University of Science and Technology (Norway) and Monroe Community College (United States) and Mathieu Hebert, Université Jean Monnet de Saint Etienne (France)

3:30 – 4:50 pm

Cypress A

This session is jointly sponsored by: Color Imaging XXIII: Displaying, Processing, Hardcopy, and Applications, and Material Appearance 2018.

3:30

MAAP-165

Color prediction based on individual characterizations of the ink layers and print support, *Théo Phan Van Song^{1,2}, Christine Andraud², Luis Ricardo Sapaico¹, and Maria Ortiz Segovia¹;* ¹Océ Print Logic Technologies – Canon Group and ²Sorbonne Universités, Centre de Recherche sur la Conservation des Collections (France)

3:50

MAAP-166

Light interreflections and shadowing effects in a Lambertian V-cavity under diffuse illumination, *Dorian Saint-Pierre¹, Rada Deeb¹, Damien Muselet¹, Lionel Simonot^{1,2}, and Mathieu Hebert¹;* ¹Université Jean Monnet de Saint Etienne and ²Institut Pprime (France)

4:10

MAAP-167

Interactive RGB transparency: A color rendering tool for superimposed translucent layers in digital images, *Lionel Simonot^{1,2} and Mathieu Hebert²;* ¹Institut Pprime, ²Futuroscope Chasseneuil, and ³Université Jean Monnet de Saint Etienne (France)

4:30

MAAP-168

General method for estimating fluorescent Donaldson matrices, *Shoji Tominaga^{1,2}, Keita Hirai¹, and Takahiko Horiuchi¹;* ¹Chiba University (Japan) and ²Norwegian University of Science and Technology (Norway)

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

Tuesday, January 30, 2018

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

Keynote: Appearance Assessment

Session Chair: Ingeborg Tastl, HP Labs, HP Inc. (United States)

8:50 – 9:30 am

Cypress A

MAAP-184

Digital appearance assessment methods and challenges, Marc Ellens, X-Rite, Inc. (United States)

Dr. Marc S. Ellens is a senior research scientist with X-Rite in Grand Rapids, MI. He received his PhD in computer aided geometric design from the University of Utah. Employed at X-Rite for 13 years, he has been involved in research and development efforts toward the capture and reproduction of appearance. Dr. Ellens has presented at numerous conferences including the NVIDIA GPU Technology conference, Autodesk's Automotive Innovation Forums, AATCC LED Lighting Conference, and SPIE Color Image Conference and Materials Conference. He is named in three patents related to material visualization and reproduction and has been a member of ACM SIGGRAPH for more than 15 years.

Appearance Assessment

Session Chair: Takuroh Sone, Ricoh Company, Ltd. (Japan)

9:30 – 10:10 am

Cypress A

9:30

MAAP-209

Perceptual appearance uniformity in 3D printing, Michael Ludwig¹, Nathan Moroney², Ingeborg Tastl², Melanie Gottwals², and Gary Meyer¹; ¹University of Minnesota and ²HP Labs, HP Inc. (United States)

9:50

MAAP-210

A model of visual opacity for translucent colorants, Helene Midtjord, Phil Green, and Peter Nussbaum, Norwegian University of Science and Technology (Norway)

10:10 – 10:50 am Coffee Break

10:00 am – 7:30 pm Industry Exhibition

Keynote: Appearance Rendering

Session Chair: Lionel Simonot, Institut Pprime (France)

10:50 – 11:30 am

Cypress A

MAAP-226

Simulating the appearance of materials, Henrik Jensen, University of California, San Diego (United States)

Prof. Henrik Wann Jensen is a professor at the University of California at San Diego, where he works in the computer graphics lab. His research is focused on realistic image synthesis, global illumination, rendering of natural phenomena, and appearance modeling. His contributions to computer graphics include the photon mapping algorithm for global illumination, and the first technique for efficiently simulating subsurface scattering in translucent materials. He is the author of "Realistic Image Synthesis using Photon Mapping," AK Peters 2001. He has rendered images that have appeared on the front covers of the National Geographic Magazine and the SIGGRAPH proceedings. He previously worked at Stanford University, Massachusetts Institute of Technology (MIT), Weta, Pixar, and at mental images. He received his MSc and PhD in computer science from the Technical University of Denmark. He is the recipient of an Academy Award (Technical Achievement Award) from the Academy of Motion Picture Arts and Sciences for pioneering research in rendering translucent materials. He also received a Sloan Fellowship, and was selected as one of the top 10 scientists by Popular Science magazine.

Discussion: Interfaces for Material Appearance Design

Session Chairs: Mathieu Hebert, Université Jean Monnet de Saint Etienne (France) and Ingeborg Tastl, HP Labs, HP Inc. (United States)

11:30 am – 12:30 pm

Cypress A

MAAP-255

Interfaces for material appearance design, Holly Rushmeier, Yale University (United States)

Computer graphics systems have elaborate systems of menus for specifying reflectance, transmittance and texture for objects. These menus are generally based on the computational structures that will be used (e.g. Specifying parameters like a "Phong exponent"), rather than on how people view or think about material appearance. Further, the systems apply to virtual materials only — not necessarily materials that will be physically produced. Only a few projects have explored other paradigms for specification — such as virtually painting test objects, rather than tweaking parameters. Little work has been done on the display requirements in terms of resolution, color reproduction and dynamic range required. The constraints of real material manufacture have not been incorporated. The role of VR and AR in material design has not been explored. This discussion will ask the audience to contribute their experiences with using and developing interfaces, and ideas for new research directions in this area.

12:30 – 2:00 pm Lunch

Plenary Session

2:00 – 3:00 pm

Grand Peninsula Ballroom D

Fast, Automated 3D Modeling of Buildings and Other GPS Denied Environments, *Avideh Zakhor, University of California, Berkeley (United States)*

Professor Avideh Zakhor discusses fast, automated 3D modeling of buildings and other GPS denied environments with examples from her work in 3D reality capture, and visual and metric documentation of building interiors. Dr. Zakhor is a serial entrepreneur with startups in outdoor mapping, indoor mapping, and micro-lithography, currently CEO and founder of Indoor Reality, a Silicon Valley startup with products in 3D reality capture, and visual and metric documentation of building interiors.

Dr. Zakhor has been faculty member at University of California, Berkeley since 1994 where she holds the Qualcomm Chair in the electrical engineering and computer science department. She co-founded OPC technology in 1996, which was acquired by Mentor Graphics in 1998, and UrbanScan Inc. in 2005, acquired by Google in 2007. UrbanScan created the first fully automated 3D outdoor mapping system for 3D exterior models of buildings in urban environments. She has received a number of best paper awards in 3D computer vision, image processing, signal processing, is an IEEE fellow, and received the presidential young investigator award in 1992. Dr. Zakhor received her BSc in electrical engineering, from the California Institute of Technology (1983), and her MS (1985) and PhD (1987) in electrical engineering and computer science from MIT.

Symposium Demonstration Session

5:30 – 7:30 pm

Grand Peninsula Ballroom E