IS&T International Symposium on

Electronic Imaging 2018

SCIENCE AND TECHNOLOGY

Where Industry and Academia Meet

28 January – 2 February 2018
Hyatt San Francisco Airport, CA

Join us

EI27: HIGH-DYNAMIC-RANGE THEORY AND TECHNOLOGY

Instructors: John McCann, McCann Imaging (US), and Alessandro Rizzi, Università degli Studi di Milano (Italy) | **Sunday January 28**, 3:45 – 5:45 PM

Course Level: Introductory/Intermediate | **Fee:** Member: $175 / Non-member: $200 / Student: $65 (*prices for all increase by $50 after January 8, 2018)

High Dynamic Range (HDR) imaging is a continuously evolving part of color—from the invention of HDR painting in the Renaissance to understanding scenes in non-uniform illumination to using multiple exposures to attempt to capture a wider range of scene information to recreating HDR scenes by integrating widely-used LCD with LED illumination. Today, the evolution continues in the current sales of HDR televisions using OLED and Quantum Dot technologies and the active area of HDR video standards.

HDR imaging records and displays more information than conventional imaging. Non-uniform illumination increases the range of light from a scene. HDR techniques are often associated with recording natural images. After a detailed description of the dynamic range problem in image acquisition, this course focuses on standard methods of creating and manipulating HDR images, replacing myths with scene measurements, camera images, and visual appearances. Measuring the actual physical limitations of scene capture, scene display, and the interaction of these systems with human vision are emphasized, as is the differences between single-pixel and spatial comparison HDR algorithms. The course presents measurements about the limits of accurate camera acquisition (range and color) and the usable range of light for displays presented to human vision. It discusses the principles of tone rendering and the role of HDR spatial comparisons.

Benefits:

- Explore the history of HDR imaging.
- Understand dynamic range and quantization: the 'salame' metaphor.
- Compare single and multiple-exposures for scene capture.
- Measure optical limits in acquisition and display (scene dependent effects of glare); of RAW capture in LDR and HDR scenes; and of human vision and calculate retinal luminance for models of vision.
- Discuss current HDR TV systems and standards: tone-rendering vs. spatial HDR methods.

Intended Audience: Anyone interested in using HDR imaging: science and applications. This includes students, color scientists, imaging researchers, medical imagers, software and hardware engineers, photographers, cinematographers, and production specialists.

Instructors: **Alessandro Rizzi** is full professor and head of the MIPS Lab in the department of computer science at the University of Milan, teaching fundamentals of digital imaging and colorimetry. He has been one of the founders of the Italian Color Group, secretary of CIE Division 8, IS&T Fellow and vice president. In 2015 he received the Davies medal from the Royal Photographic Society.

John McCann received a degree in biology from Harvard; he worked in, and managed, the Vision Research Laboratory at Polaroid from 1961 to 1996. His publications and patents have studied Retinex theory, color constancy, color from rod/cone interactions at low light levels, appearance with scattered light, and HDR imaging. He is a Fellow of IS&T and OSA, as well as a past president of IS&T, the IS&T/OSA 2002 Edwin H. Land Medalist, and IS&T 2005 Honorary Member.

SYMPOSIUM PLENARY TALKS

Monday: Overview of Modern Machine Learning and Deep Neural Networks – Impact on Imaging and the Field of Computer Vision, **Greg Corrado, co-founder of Google Brain and Principal Scientist at Google**

Tuesday: Fast, Automated 3D Modeling of Buildings and Other GPS Denied Environments, **Avideh Zahkor, Qualcomm Chair & Professor at UC Berkeley**

Wednesday: Ubiquitous, Consumer AR Systems to Supplant Smartphones, **Ronald T. Azuma, Intel Labs Researcher and Augmented Reality Pioneer**

SYMPOSIUM HIGHLIGHTS

- 18 conferences featuring 30 keynote talks by world reknown experts
- 3D Theatre
- Tours of Stanford University Labs
- Industry Exhibition
- Meet the Future: Showcase of Student and Young Professional Research
- Demonstration Session
- Poster Session
- Welcome Reception
- Women in Electronic Imaging Breakfast
- Human Vision in Electronic Imaging 30th Year Banquet

To register or learn more, visit
www.ElectronicImaging.org

IS&T
imaging.org

Information confirmed as of 12/06/17