

Where Industry and Academia Meet

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EI23: PRACTICAL INSIGHTS INTO IMPLEMENTING A CINEMATIC VR CAPTURE SYSTEM**Instructors:** Nitin Sampat and J. A. Stephen Viggiano, Rochester Institute of Technology (US) | **Sunday January 28, 1:30 – 3:30 PM****Course Level:** Introductory/Intermediate | **Fee:** Member: \$175 / Non-member: \$200 / Student: \$65

(*prices for all increase by \$50 after January 8, 2018)

Virtual Reality is experiencing an explosive growth in a variety of applications, including gaming and cinema. "Cinematic VR" requires very high quality cameras to meet the expectations of consumers used to viewing content in a movie theater. This content should also be free of the distortions commonly encountered with the fish-eye lenses used to capture scenes.

Companies such as Google, Facebook, Jaunt, and Lytro have started offering solutions for high-quality cinematic VR content, but the challenge of handling the very large amount of generated data and the associated (very long) rendering times remains. Additionally, the calibration and optimization of the imaging pipeline present new challenges to every aspect of making a VR movie: data handling, storage, calibration, rendering, editing, audio, output onto a headset, and cost. We have successfully built, calibrated, and used the open source FB Surround 360 camera to generate VR content. This camera can output 8K, stereo content and is the highest quality camera one can deploy for cinematic VR applications. In building and using said camera, we have gained a significant insight into VR workflows and the many challenges that present themselves at the different stages of the process.

This course shares practical insights into the process and helps students gain an appreciation into what it takes to build such a system. Recommendations for design—hardware and software, imaging pipeline optimization, and preferences/suggestions from creative users of such a system—are offered.

Benefits:

- Appreciation of available cinematic VR capture solutions.
- Understand bandwidth requirements, hardware options, and data handling of VR content.
- Explore technology, issues, and challenges in implementing (and improving) a VR capture pipeline: Exposure calibration, neutral balance, black level, rendering (stitching), spatial audio, viewing/projecting, etc.

Intended Audience: People involved in the design and use of VR cameras will benefit greatly from this course. Technical staff of manufacturers, managers of VR products/teams, students, researchers, and anyone interested in gaining a practical insight into this fast evolving field will receive a "jumpstart" into this new and exciting medium.

Instructors: **Nitin Sampat** is a professor in the photographic sciences department at RIT where he teaches and conducts research in photography, color science, image processing, and imaging quality. His current research is focused on building, testing, calibrating and deploying the 8K stereo, and Facebook Surround 360 camera for VR capture applications.

J. A. Stephen Viggiano is assistant professor in photographic sciences at RIT and was Principal and Founder of Acolyte Color Research, a consulting and research firm specializing in solutions to problems in color science and technology. Viggiano also taught statistics at RIT's School of Mathematical Sciences.

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

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