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

EI14: 3D IMAGING

Instructor: Gady Agam, Illinois Institute of Technology (US) | **Tuesday January 30**, 8:30 AM – 12:45 PM

Course Level: Introductory | **Fee:** Member: $275/ Non-member: $300 / Student: $95 (*prices for all increase by $50 after January 8, 2018)

The purpose of this course is to introduce algorithms for 3D structure inference from 2D images. In many applications, inferring 3D structure from 2D images can provide crucial sensing information. The course begins by reviewing geometric image formation and mathematical concepts that are used to describe it, and then moves to discuss algorithms for 3D model reconstruction.

The problem of 3D model reconstruction is an inverse problem in which we need to infer 3D information based on incomplete (2D) observations. We discuss reconstruction algorithms which utilize information from multiple views. Reconstruction requires the knowledge of some intrinsic and extrinsic camera parameters and the establishment of correspondence between views. Also discussed are algorithms for determining camera parameters (camera calibration) and for obtaining correspondence using epipolar constraints between views. The course introduces relevant 3D imaging software components available through the industry standard OpenCV library.

Benefits:

- Describe fundamental concepts in 3D imaging.
- Develop algorithms for 3D model reconstruction from 2D images.
- Incorporate camera calibration into your reconstructions.
- Classify the limitations of reconstruction techniques.
- Use industry standard tools for developing 3D imaging applications.

Intended Audience: Engineers, researchers, and software developers who develop imaging applications and/or use camera sensors for inspection, control, and analysis. The course assumes basic working knowledge concerning matrices and vectors.

Instructor: **Gady Agam** is an associate professor of computer science at the Illinois Institute of Technology. He is the director of the visual computing lab at IIT which focuses on imaging, geometric modeling, and graphics applications. He received his PhD from Ben-Gurion University (1999).

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