

## SenSIP Seminar Series

### Energy-efficient Computer Vision using Hardware-Software Codesign

Presenter: Suren Jayasuriya

Assistant Professor in AME + ECEE, ASU

January 25 (Thursday), 2018, 2:00 PM / Room: GWC 487

#### Abstract

Computer vision has had tremendous success in recent years, driving applications from object detection, recognition/tracking, segmentation, SLAM and other robotics applications. But the energy costs of image sensing and processing can be prohibitive for embedded vision, limiting battery life and deployment in the field. In this talk, I'll present our research on using specialized image sensors to capture features for computer vision directly, and that are energy-efficient. I'll first discuss a way to optically compute the first layers of convolutional neural networks using custom CMOS diffractive image sensors called Angle Sensitive Pixels. Then I will present research on the optimal image signal processing (ISP) pipeline for computer vision, and the design for reconfigurable image sensors that can switch between photography and vision modes. By modifying the abstraction and design boundaries between image sensors and processing, we can envision new possibilities for energy-efficient visual computing in the future.

#### Biography:



Suren Jayasuriya is an assistant professor at Arizona State University, in the School of Arts, Media and Engineering (AME) and Electrical, Computer and Energy Engineering (ECEE). Before this, he was a postdoctoral fellow at the Robotics Institute at Carnegie Mellon University. Suren received his Ph.D. in ECE at Cornell University in Jan 2017 and graduated from the University of Pittsburgh in 2012 with a B.S. in Mathematics (with departmental honors) and a B.A. in Philosophy. His research interests are computational imaging and photography, computer vision, and image sensors. He has received the NSF Graduate Research Fellowship in

2013, the Qualcomm Innovation Fellowship in 2015, and the best paper award at ICCP 2014.

#### Refreshments

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