Electrical & Computer ENGINEERING

Carnegie Mellon University

Research Seminar

Energy and Information Systems (EIS)

Plenoptic Imaging and Vision using Angle Sensitive Pixels

Suren Jayasuriya | Cornell University

Tues. May. 31, 2015 | 12:00-1:00 PM | Porter Hall B34

Seminar abstract:
A new wave of computational cameras are on the horizon, sensing additional dimensions of the plenoptic function of light and enabling new computer graphics and vision applications. In this talk, I present custom CMOS diffractive image sensors known as Angle Sensitive Pixels (ASPs) which utilize integrated metal diffraction gratings to sense the plenoptic function. In particular, I will show how ASPs can capture high resolution 4D light fields using dictionary-based sparse coding algorithms. In addition, I will show recent work where the first layer of convolutional neural networks are optically computed using ASPs, and demonstrate energy/bandwidth savings using these computational cameras as the front end for deep learning. All of this research points to a convergence of new cameras with machine learning for future intelligent imaging systems.

Speaker Bio:
Suren is a PhD student in Cornell ECE under the direction of Dr. Alyosha Molnar. His research interests are in computational imaging and photography, computer vision and graphics, and mixed-signal integrated circuits/sensors. He received the NSF Graduate Research Fellowship in 2013, and a Qualcomm Innovation Fellowship in 2015. Before Cornell, he obtained a B.S. in Mathematics and B.A. in Philosophy from the University of Pittsburgh in 2012. More information can be found at his website: http://molnargroup.ece.cornell.edu/people/suren-jayasuriya/.

Energy and Information Systems (EIS) Seminar Committee:

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Jonathan Mei

Seminar notes: Refreshments will be served