Thursday, Feb. 7th
Scaife Hall Auditorium
Room 125 at 4:30 p.m.
Refreshments at 4:00 p.m.

A sensible view in the post-Nyquist era

Our fascination with detail is never-ending. We have built cameras that capture images with billions of pixels and videos at millions of frames per second. The key enabling technology behind these cameras is the role of Silicon as the sensing material of choice in visible spectra of light. In other modalities, where sensing is inherently costly, sensing at high spatial and temporal resolutions often comes with steep constraints. Two classic examples are sensing in infrared, where sensor materials are expensive, and MRI, where capture time is costly. In such cases, traditional methods for sensing, which advocate sampling faster and with higher resolution, do not scale well.

In this talk, I will give a broad overview of how signal models can play an important role in breaking traditional sensor limitations. I will present multiple examples from both my research and others’ that provide insight in their use, concentrating on imaging architectures that exploit such priors. Towards the end, I will briefly talk about how these ideas are applicable in beyond problems in sensing. Specifically, I will talk about efficient processing of high dimensional data via dimensionality reduction.

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Aswin Sankaranarayanan is an assistant professor in the ECE Department at Carnegie Mellon University. His research interests lie broadly in the areas of computer vision, signal processing, and image and video acquisition. Aswin received his B.Tech in Electrical Engineering from the Indian Institute of Technology, Madras in 2003 and MSc and PhD degrees from the Department of Electrical and Computer Engineering at the University of Maryland, College Park in 2007 and 2009, respectively. He was awarded the Distinguished Dissertation Fellowship by the Dept. of Electrical and Computer Engineering at the University of Maryland in 2009. He was a post-doctoral researcher at the DSP group in Rice University, prior to joining Carnegie Mellon.

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