Imaging Science Seminar

Structured Uncertainty and Unsupervised Training for Neural Networks in Vision

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Abstract. The talk will discuss two recent projects in the Vision and Learning Group at WashU. The first half of the talk will present a new approach to train deep neural networks to produce probabilistic outputs for scene depth, rather than a single deterministic depth map. These outputs are formed as a sample approximation of multiple plausible outputs produced by a network trained as a GAN, and are versatile in that they enable inference for a variety of tasks from a single network model that is trained in a task-agnostic way. Then, I will describe a way to train image estimation networks in application settings where ground-truth is difficult, or even impossible, to capture. Instead of training on pairs of measurements and ground-truth images, we propose a method that is able to train on a dataset of measurement pairs—as long as measurement parameters in each example are statistically independent and sufficiently diverse. Our method is able to handle the setting of blind estimation— when measurement parameters are unknown, even during training.

Time: 8:30-9:30 a.m.
Date: Friday, October 11, 2019
Room: 0120 Green Hall

Biography: Ayan Chakrabarti is an Assistant Professor in CSE at Washington University in St. Louis. His research interests are in the fields of computer vision, computational photography, and machine learning. He works on developing systems that can recover physical reconstructions and semantic descriptions of the world from visual measurements, for applications in robotics and autonomous vehicles, consumer photography, graphics and virtual reality, and more. His research focuses on ways to learn and exploit the statistical structure of natural images and scenes, to design efficient and accurate inference algorithms, as well as new kinds of high-capability sensors and cameras.