Abstract:

Traditionally, one of the major challenges in computer graphics has been the generation of photorealistic images. Conceptually, this problem is simple: simulate the behavior of light as it travels from light sources and interacts with materials until it reaches our virtual eye. In practice this can be done by numerically approximating the "rendering equation" using Monte Carlo integration, which corresponds to following a subset of photons around the scene. Unfortunately, tracing even a subset of the photon paths takes significant time. Obviously, generating realistic images quickly, at 30 or more frames per second, requires some simplifications.

This talk presents these challenges and discusses common techniques for interactive graphics, which generally rely on object- and image-space approximations. To show the feasibility of these techniques, I will discuss examples from my recent work as case studies.

Bio:

Chris Wyman is an assistant professor in the Department of Computer Science at The University of Iowa. He joined the faculty at Iowa after earning a Ph.D. in Computer Science from the University of Utah in 2004. He specializes in computer graphics, with research interests that include real-time rendering, interactive global illumination, interactive rendering of specular and complex materials, perceptually-guided simplification of lighting models, and rendering for scientific visualization.

All ECE graduate students are required to attend.

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