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Date	Friday, January 17, 2025
Time	12:00 to 1:00 PM
Location	SEC 201

Title: *Optics, sensors and AI: synergic computational bio-imaging*

Abstract: In this talk, I will discuss several projects in my lab that are related to optics, sensors, and artificial intelligence. In particular, I will provide examples of how co-designing sensors, optics and AI algorithms results in superior performance capabilities for imaging systems. I will give a few example projects: (1) how co-designing microscope optics along with AI algorithms can enable high-throughput microscopy, (2) how novel diffractive and meta-optical elements allow us to realize imaging systems with novel functionalities and form-factors and finally, time-permitting, (3) how emerging neural representations along with high resolution spatial light modulators can allow us to image through thick scattering media without the need for guide stars. I will use these projects to argue that we should look at the three computational blocks within an imaging system, optics, sensors and algorithms together and that co-designing them can result in significant performance improvements over current art.

Bio: Ashok Veeraraghavan is an Electrical and Computer Engineering Professor at Rice University. At Rice, he directs the computational imaging lab, which focuses on solving complex and challenging problems in imaging and vision by co-designing sensors, optics, electronics, signal processing, and machine learning algorithms. He also serves as the Chair of the ECE Department. Before joining Rice University, he spent three wonderful and fun-filled years as a Research Scientist at Mitsubishi Electric Research Labs in Cambridge, MA. He received his Bachelor in Electrical Engineering from the Indian Institute of Technology, Madras, in 2002 and his M.S and PhD. Degrees from the Department of Electrical and Computer Engineering at the University of Maryland, College Park in 2004 and 2008 respectively. His thesis received the Doctoral Dissertation Award from the ECE Department. His work has won numerous awards, including the Peter and Edith O'Donnell Award for Engineering in 2024, the Charles Duncan Innovation Award 2019, and Hershel. M. Rich Invention Award in 2016 and 2017, and an NSF CAREER award in 2017. He loves playing, talking, and almost anything to do with the slow and tedious but enthralling game of cricket.