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Invited Speaker

Dr. Vibhav Vineet, Microsoft Research

"Advancing AI with Synthetic Data: From Perception to Long-Horizon Agents"

Thursday, September 25, 2025 • 2:00PM • Global 229 • Zoom

Abstract:
As AI shifts from passive models to active agents, the key bottleneck has become data—its quality, coverage, and controllability. Constructing labeled datasets, whether for per-pixel segmentation or multi-step user interaction, is slow, expensive, and privacy-sensitive. At the same time, internet-scale corpora often lack the grounded supervision and action traces required for agentic tasks. Synthetic data provides a compelling alternative: it is abundant, controllable, and can be precisely aligned with target tasks, enabling safer and more scalable advances in performance.

In this talk, I will present my research on synthetic data generation spanning perception and agentic tasks. I will begin with image-centric efforts, from interactive data creation to game-based pipelines, before introducing on-demand approaches such as Neural-Sim for task-aware image generation. I will then discuss recent work on synthetic pipelines for long-horizon agentic tasks. Collectively, these efforts will demonstrate how synthetic data can accelerate the development of robust, interpretable, and safe AI systems across both digital and physical domains.

Bio:
Vibhav Vineet is a Principal Researcher in the AI Frontiers Group at Microsoft Research, Redmond. His work spans computer vision and the development of robust, generalizable AI systems designed for reliable real-world deployment. He has published in leading computer vision, machine learning, and robotics venues, and his research has been featured by media outlets such as the BBC. Before joining Microsoft Research, he was a postdoctoral researcher at Stanford University and the University of Oxford. He received his Ph.D. from Oxford Brookes University, where his dissertation earned the BMVA Sullivan Thesis Prize for the best doctoral thesis in computer and natural vision in the UK. His research has also been recognized with honors, including a Best Student Paper Award at 3DV.