

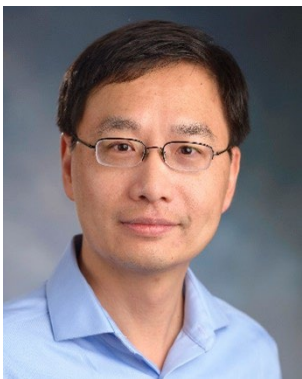
Friday, October 24, 2025

11:15am, ITE 336

Parameter Efficient Fine-Tuning of Foundation Models & Its Applications to Robotics

Dr. Jonathan Shihao Ji

Foundation models (FMs) represent a paradigm shift in artificial intelligence (AI), offering large-scale, pre-trained neural-network models that serve as adaptable starting points for various downstream applications. Parameter-efficient fine-tuning (PEFT), such as low-rank adaptation (LoRA), is one of the latest advancements in AI on efficient adaptation of FMs. However, as the need for per-user or per-task model customization grows, the existing PEFT methods incur substantial storage and transmission costs. In this talk, I will first present our latest works on PEFT, including VB-LoRA and Uni-LoRA, which achieve extreme parameter efficiency on NLU, CV, Instruct Tuning, and Mathematical Reasoning. Extensive experiments show the effectiveness of our method; when fine-tuning the Llama2-13B model, our method only uses 0.4% of LoRA's parameters yet achieves superior results. I will then discuss recent trends of integrating FMs (e.g., LLM, VLM, VLA) into robotics, a specific domain of interest of my group. I will showcase a few examples of FM-powered robotic systems including Pepper, Spot, and Networked Drones. Latest progress, challenges, and opportunities will be discussed.



Dr. Jonathan Shihao Ji is an Associate Professor in the School of Computing at University of Connecticut. His principal research interests lie in the area of deep learning and its applications to computer vision, natural language processing, and robotics, with an emphasis on high-performance computing. He is interested in developing efficient algorithms that can learn from a variety of data sources (e.g., image, audio, text, and time series) on large scale and automate decision-making processes in dynamic environments. Dr. Ji has published over 60 papers in top-ranked journals and prestigious conferences with high impact factors, including CVPR, NeurIPS, ICCV, ECCV, ICLR, ICML, AAAI, AISTATS, BMVC, ECML, ICIP, IJCNN, EMNLP, SIGIR, CIKM, COLING, IEEE TPAMI, TSP, TKDE, TPDS, IEEE Internet of Things Journal, etc. His research has been funded by federal agencies, including NSF, NIH, DoD, ARO, as well as industry, such as VMware, Cisco, Nvidia, and Bill & Melinda Gates Foundation. Dr. Ji received his Ph.D. in ECE from Duke University in 2006. Before joining UConn, he was an Associate Professor in Computer Science at Georgia State University and Director of the DoD Center of Excellence (CiARE). Prior to returning to academia, he spent approximately 10 years in industry research labs. He is a Senior Member of the IEEE

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