James Song

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Education

University of Michigan — Expected May 2026

B.S.E. Computer Science and Engineering, B.S. Mathematics — GPA: 3.96/4.00

- Coursework: Machine Learning Theory • Generative Models • Foundations of LLMs • Linear Algebra • Operating Systems • Probability Theory • Discrete Stochastic Processes

Papers

When "Correct" Is Not Safe: Can We Trust Functionally Correct Patches Generated by Code Agents?

Yibo Peng*, James Song*, Lei Li*, Xinyu Yang, Mihai Christodorescu, Ravi Mangal, Corina Pasareanu, Haizhong Zheng, Beidi Chen

In Submission (*Meta Review: 4*)

Research Experience

Research Intern, CMU InfiniAI Lab — Pittsburgh, PA — May 2025 − Present

Advisor: Prof. Beidi Chen

- Investigated vulnerable behaviors of LLM Code Agents, namely mini-SWE-agent, SWE-agent, and OpenHands, on functionality-tested benchmarks such as SWE-bench and CWEval, exposing up to 66% in funcionally correct but insecure code in their generation.

Research Assistant, UofM Department of ECE — Ann Arbor, MI — Feb 2025 − Present

Advisor: Prof. Liyue Shen

- Investigated methods for conditioning generative models with UNet and DiT-based backbones such as Stable Diffusion and Flux to improve lung nodule progression modeling, reaching up to 0.81 AUROC in prediction score.
- Explored techniques for controllable image generation using diffusion models in an image-to-image setting, focusing on conditioning strategies such as cross-attention, DAFT, SFT, and SPADE.

Research Assistant, UofM Transportation Institute — Ann Arbor, MI — May 2023 − Aug 2024

Advisor: Prof. Jingwen Hu

- Refined 3D Meshes of human bone structures using Principal Component Analysis, Iterative Closest Point Algorithm, and KD TreeSearcher to predict human geometry.
- Designed a Point Cloud Registration algorithm to automate mesh morphing between target models and baseline models in MATLAB to increase Mesh Morphing's efficiency and accuracy in 3D Spinal Structures. (Video Presentation, Poster)

Teaching Experience

Instructional Aide (EECS 445: Machine Learning), UM CS — Ann Arbor, MI — Aug 2024 − Dec 2024

- Supported student learning with team of 12 instructional aides by providing weekly office hours and curating weekly discussion notes and projects for 300+ students.
- Taught weekly discussions sections on topics including Kernelized Linear Regression and Classification, Deep Neural Nets, Transformers, and Generative Models.

Personal Projects

Linear Mode Connectivity (LMC) Experiment June 2024 − July 2024
- Replicated LMC in the LeNet and ResNet20 models using Pytorch based on the paper "Linear Mode Connectivity and the Lottery Ticket Hypothesis" by Frankle et al. (2020).
- Reimplemented the GPT-2 architecture and training details from scratch in pytorch to investigate whether LMC exists in decoder-only transformers.

VidBite June 2024 − July 2024
- Implemented a video generator that creates 30-second clips visualizing user queries on mathematical or scientific concepts using Retrieval-Augmented Generation (RAG) with Claude Sonnet 3.5 and Google Gemini in Langchain to generate Manim code.
- Scraped Manim Documentation for a vectorDB and implemented a vector search during RAG.

Skills

Programming Languages: Python, MATLAB, C++, C, JavaScript, Java

Tools and Frameworks: Pytorch, vllm, transformers, Llama2, Flask, FastAPI, Git, Langchain, Scikit-Learn