Manxi (Maggie) Shi

San Jose, CA | manxishi@mit.edu | 408-477-4595

Education

Massachusetts Institute of Technology, *BS in EECS and Physics* **(May 2027)**

Relevant Coursework: Machine Learning, Deep Learning (G), Data Structures and Algorithms, Computation Structures, Computer Systems, Hardware Architecture for Deep Learning (G), Quantum Physics I and II, Statistical Physics, Probability, Statistical Data Analysis
Membership: MIT IAFI (NSF AI Institute for Artificial Intelligence and Fundamental Interactions), MIT Society of Physics Students

Work Experience

Software Engineer Intern: Quadric.io **(Jan 2025 – Present)**
Simulate numerical behavior of Quadric's Chimera processor with Onnxruntime library, which performs inference through graph-formatted (Onnx) ML model. To be used as a baseline for numerical validation studies compared to inference on Chimera processor. Implemented ops for vision models (ResNet), and language in the future, in Onnxruntime with a C++ backend/Python UI. Worked closely with the compiler team and learned about techniques for efficient inference.

Software Engineer Intern: Amlogic Inc. **(June 2024 – Aug 2024)**
Optimize audio resampling algorithm written in C with Neon intrinsics on ARM architecture. Gained proficiency in performance engineering: vectorizing SIMD code, optimizing compiler ability, and performance profiling. Gained experience with embedded systems, cross compiling, and signal processing.

Research

A Study of Variation Across Attention Heads and Layers **(Nov 2024 – Dec 2024)**
Proposed novel method of weight sharing for efficient attention computation. Trained ViTs and fine tuned BERT for evaluation of proposed weight sharing. Blog link. Research conducted with a peer as part of Deep Learning (G) class at MIT.

MIT Research Laboratory of Electronics, *Prof. Soljacic* **(Sep 2023 – Present)**
Develop theoretical models for and numerically simulate on computing cluster 3D photonic crystal designs to confine light in nanocavities without use of a photonic bandgap. Gained knowledge of group theory, supercomputing clusters, Scheme, Linux, and SLURM. Paper in progress.

Computational Fluid Dynamics **(Jan 2023 – May 2023)**
Created Python simulation of the Lattice Boltzmann Method to model fluid flow around a cylinder in a walled channel. Gained experience with computational physics modeling in Python.

MIT Lincoln Laboratory **(June 2020 – July 2020)**
Private automated contact tracing with Raspberry Pi's and machine learning for COVID-19: piPACT. Trained supervised classification model with constructed dataset of BLE RSSI signals to classify proximity as greater than or less than 6 feet apart.

Awards

2022 US Physics Team Member (Top 20 in the US)
US Physics Olympiad (USAPhO) Gold Medalist (2022)
3x AIME Qualifier (2021/2022/2023)

Skills

General: Python, C, C++, Java, RISC-V Assembly, Bash scripting, PyTorch, MATLAB, Bluespec, CUDA
Math: Linear Algebra, Probability, Statistics, Differential Equations, Calculus