# Manxi (Maggie) Shi

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## Education

**Massachusetts Institute of Technology,** *BS in EECS and Physics* **(May 2027)**
Relevant Coursework: Data Structures and Algorithms, Machine Learning, Deep Learning, Computation Structures, Quantum Physics, Probability

**BASIS Independent Silicon Valley,** *Graduated with High Honors* **(August 2019 – May 2023)**

## Experience

**Researcher: MIT Photonics and Modern Electro-Magnetics Group, *Prof. Soljacic*** **(Sep 2024 – Present)**
Create an "AI Scientist" with RAG for LLMs to automate the research process in photonics, starting with novel idea generation.

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

**Researcher: MIT Photonics and Modern Electro-Magnetics Group, *Prof. Soljacic*** **(Sep 2023 – Present)**
Develop theoretical models for and test with simulations 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 Research** **(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.

**Yale Summer Program in Astrophysics** **(June 2022 – Aug 2022)**
Programmed in Python asteroid orbit simulation (Monte Carlo genetic algorithm, Method of Laplace, Stormer-Verlet numerical integrator) with photometry data extracted from images taken at Yale's Leitner Observatory.

**MIT Lincoln Laboratory Beaver Works Summer Institute: Build a CubeSat** **(July 21 – Aug 2021)**
CAD designed, built, and programmed a prototype LEO CubeSat and Ground Station operated with Raspberry Pis. Gained experience with Linux and systems engineering.

**MIT Lincoln Laboratory Beaver Works Summer Institute: piPACT Project** **(June 20 – July 2020)**
Analyzed bluetooth RSSI signals from two Raspberry Pi's for the purpose of proximity detection for COVID-19. Gained experience with Sci-kit Learn, Pandas, Numpy for machine learning and Linux.

**University of Chicago Pathways in Data Science** **(June 2020 – July 2020)**
Used python to analyze census data and its implications on societal issues such as police brutality.

**Inspirit AI** **(June 2020 – July 2020)**
Applied machine learning in Python to medical imaging, specifically for pneumonia detection from lung x-rays.

## Awards

2022 US Physics Team Member, US Physics Olympiad (USAPhO) Gold Medalist (2022)
3x AIME Qualifier (2021/2022/2023)

## Skills

**General programming:** Python, C, Java, RISC-V Assembly, ARM, Linux, Bash/shell scripting, HPC, PyTorch
**Math:** Linear Algebra, Probability, Statistics, Differential Equations, Calculus