Samuel Tian

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Education

Massachusetts Institute of Technology Cambridge, MA

B.S. Computer Science and Engineering, GPA: 5.0/5.0 Sep 2021 - May 2025 (expected)

- Relevant Coursework: Natural Language Processing, Formal Verification, Machine Learning, Computer Architecture, Algorithms and Data Structures, Probability, Linear Algebra, Differential Equations, Linguistics

Liberal Arts and Science Academy Austin, TX

High School Diploma Aug 2017 - May 2021

Work Experience

Distributed Robotics Laboratory | MIT CSAIL Cambridge, MA

Undergraduate Research Fellow Jun 2022 - present

- Develops reinforcement learning environments in NVIDIA IsaacGym for surgical automation
- Trains agents using state-of-the-art multi-agent actor-critic learning algorithms written with PyTorch
- Writes Python scripts and uses Blender to edit asset meshes and robot design files
- Connects simulation environment using ROS to real surgical robots for evaluation

Programming Languages and Verification Group | MIT CSAIL Cambridge, MA

Undergraduate Research Fellow Jan 2022 - present

- Implements formally verified modular reduction algorithm in Coq for Curve25519 Diffie-Hellman protocols
- Collaborates with University of Adelaide researchers to compile templates into fast, highly optimized assembly that outperforms gcc/clang output and is competitive with manually optimized implementations
- Contributes to open-source code base by writing pull requests that pass continuous integration checks
- Submits paper to the 2023 Conference on Programming Language Design and Implementation

Projects

Trading Bot with Market Forecasting Apr 2022 - present

- Created cryptocurrency trading bot that utilized previous market prices and news article headlines
- Stored historical and real-time data gathered from web scraping and websockets in a PostgreSQL database
- Computed future predictions using HuggingFace sentiment transformers and PyTorch-based LSTM networks

Depth Estimation Aug 2020 - Dec 2020

- Built multiscale convolutional neural network in TensorFlow for depth estimation of indoor scenes

Threat Detection in Maritime Settings Jun 2020 - Apr 2021

- Implemented Hidden Markov Models from scratch in C++ for classification of ship trajectories
- Applied fast Fourier transforms and vector quantization to reduce dimensionality of input trajectories

Novel Lossless Data Compression Algorithms Jun 2019 - Jan 2020

- Developed mathematically optimal data compression algorithms that operated on the set of unbounded integers
- Utilized a dynamic segment tree to significantly speed up algorithm runtime for large inputs

Skills

- Languages: C++, Python, Java, Coq, SQL, Object Oriented Programming, Functional Programming
- OS: Linux, macOS, Windows
- Tools: Git, continuous integration, Vim, Emacs, scikit-learn, PyTorch, TensorFlow, HuggingFace, Pandas

Awards

- Olympiads: USACO Platinum Qualifier, AIME Qualifier (4x)