Andrew Yuan

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Education

Massachusetts Institute of Technology — Cambridge, MA

B.S. Mathematics; B.S. Computer Science — Sep. 2023 — present

- **Selected Coursework:** Design & Analysis of Algorithms, Fundamentals of Statistics, Abstract Algebra I, Real Analysis, Probability & Random Variables, Economic Game Theory, Intro to Machine Learning, Web Lab
- **Honors & Awards:**
  - Putnam Top 250; USAMO Qualifier & USAJMO Top 50; USAPhO Semifinalist; USACO Gold Division
  - US Presidential Scholar; Regeneron Science Talent Search Scholar; National Merit Scholar

Industry Experience

WeRide — Jun. 2024 – Aug. 2024

Software Engineer Intern — *San Jose, CA*

- Designed the .rafa (Random Access / Fast Append) file format, a custom archive file format for small file packing.
- Created a high-performance C++ API for RAFA packing & integrated it with the **SLAM** map generation system.
- Developed a parallelized, highly scalable data migration tool to pack ∼**1 billion** sensor/map files on cloud into .rafa format. Optimized scalability of file dependency resolution using LRU-based caching.
- RAFA packing reduces sensor/map files stored to cloud by **97%**, alleviating disk pressure on private cloud servers.

Research Experience

UVA Biocomplexity Institute — Jun. 2022 – Jul. 2023

Research Intern — *Remote*

- Researched networked dynamical systems and combinatorial optimization on multi-agent networks.
- Proved expected performance bounds for approximation algorithms; solved combinatorial sub-problem via reduction to polyomino tiling; empirically validated algorithm performance via simulations.
- Co-authored paper published at AAMAS '23 (international conference). Won Regeneron STS Scholar for my research.

JHU Applied Physics Laboratory — Oct. 2021 – May 2022

Data Science Intern — *Remote*

- Interned through the ASPIRE program; investigated the relationship between climate change and human migration.
- Used Pandas in Python to process, clean, and organize 10 years of flood data and population data.
- Performed statistical analyses through regression modeling and created data visualizations.

SpringGem Weather Information — Jun. 2020 – Mar. 2021

Research Intern — *Remote*

- Researched road ice detection in drone images. Conducted field experiments and processed/analyzed images; my work validated the feasibility of detecting road ice using NDVI in calibrated RGN photographs.
- Co-authored paper presented at the 2020 American Geophysical Union (AGU) Fall Meeting.

Projects & Extracurriculars

Tradeswipe | website | *Javascript (React, Node.js, Express.js, SocketIO), MongoDB, HTML/CSS*

- Developed a full-stack web application providing a two-sided marketplace for trading MIT meal swipes.
- Implemented both a live and asynchronous market, as well as authentication, live chat, and transactional emails.
- Obtained **420+** unique users and processed **$1000+** worth of transactions **within 2 weeks of release**.

clarity.ai | github | *Python (Modal, TensorRT-LLM, FastAPI, Flask), Javascript (MERN stack), HTML/CSS*

- Built a multi-agent LLM application that researches complex issues from 10 different political perspectives & aggregates the similarities/differences. Integrated LLM system into a web application with chat interface & chat history features.
- LLM system uses a webscraper to find articles & deploys a modified TensorRT-Llama, running parallel agents on Modal.

Math4All: Founder and (Former) President

- Founded Math4All, a 501(c)(3) nonprofit dedicated to making competitive math more accessible.
- Led team of 40+ student volunteers; engaged 1300+ students from 25+ countries through contests/classes/community.

Activities: MIT THINK (Co-Director), Full Stack @ MIT (Officer), Undergrad Math Association (Officer), Club Volleyball

Technical Skills

Programming Languages: Python, C, C++, Java, JavaScript/TypeScript, HTML/CSS
Frameworks & Libaries: React, Node.js, Express.js, Flask, MongoDB, SocketIO, Numpy, Pandas
Software & Tools: Git/GitHub, Linux/Unix, AWS S3, Bazel, VS Code, Figma, LaTeX