Austin Jiang

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Education

University of Waterloo Waterloo, ON, Canada
Honours Bachelor of Computer Science | Major GPA: 4.0/4.0 *Expected graduate in 2028*

- **Scholarships**: Mathematics National Scholarship, President's Scholarship of Distinction

Experience

Multicore Lab, University of Waterloo Waterloo, ON, Canada
Undergraduate Research Assistant (supervised by Dr. Trevor Brown) | **C++, CUDA** *Sep 2025 – Present*

- Contributed to extending Verlib (PPoPP'24) with **lock-free data structures on GPU** for efficient range queries.
- Implemented a CPU baseline (hash map with global locking) for controlled performance comparison.
- Migrated the build to the **CUDA toolchain (nvcc)**, resolving host-device and compiler compatibility issues.
- Developed a **VerlibAdapter abstraction** to support both **versioned and non-versioned** data structures.

Wolfram Research Remote
Research Intern (Wolfram Emerging Leaders Program '25) | **Mathematica, Wolfram Kernels** *Sep 2025 – Present*

- Built a cellular automata **parallel computing** engine with tiled updates and halo exchange for correctness.
- Implemented sparse frontier updates plus dense scans, achieving a **127% speedup** on low activity states.
- Designed a **benchmark harness** reporting updates per second, active ratio, and scheduling overhead.
- Designed a **load-balancing strategy** with imbalance monitoring and tile repartitioning across **multiple kernels**.

Wolfram Research Remote
Research Intern (Wolfram Emerging Leaders Program '24) | **Mathematica** *Sep 2024 – Jan 2025*

- Designed a voxelization pipeline converting 3D meshes into binary grids for cellular automata simulation.
- Developed algorithms to detect unsupported and overhanging regions critical for 3D printing infill.
- Designed **benchmarking metrics** to measure density, connectivity, and printability of generated infills.
- Produced a first-author research paper, presented at the **Wolfram Technology Conference 2025**.

Projects

Lambda Calculus Interpreter | C++: Built a Lambda Calculus interpreter with a parser, AST, and normal order evaluator, using de Bruijn indices to avoid variable capture and supporting curried forms.

LookAround AI, AdventureX (Multimodel Track Winner) | Python, React: Built a voice-controlled multi-agent tour guide using the TEN Framework, integrating Google Maps Street View API for route narration.

Zebra Giraffe Swap | Google Cloud Platform, PyTorch: Built a concept-swapping fine-tuning model via selective UNet training, implemented in PyTorch with Hugging Face Diffusers, using a preprocessing pipeline on COCO 2017.

Stock Explain, Cal Hacks | Python, React: Built a full stack AI platform with an autonomous web browsing agent, integrating BrightData APIs and adaptive search strategies to actively fetch, unlock, and reason over live market data.

Personal Infrastructure & Services | Linux, FastAPI, SQL: Built & maintained a personal Linux server hosting a full-stack website behind Nginx, Cloudflare DNS, cloud storage, OpenVPN, email service, and FastAPI + SQL backends.

Awards

Meta Hacker Cup Round 2: Ranked 813th out of 13779 participants overall, top 6% worldwide.
Generation Google Scholarship: Google's flagship undergraduate scholarship for impact in technology (1 of 55).
Canadian Computing Olympiad 2024 & 2025: Achieved silver medals, placing top 10 in a national contest twice.
USACO 2024 (Platinum): Achieved the highest division of the USA Computing Olympiad.

Skills

Languages/Framework: C++, C, Python, Java, C#, Bash, JavaScript, TypeScript, Rust, React, Node.js
Tools/Libraries: Linux, Git, CUDA, CMake, PyTorch, TensorFlow, SQL, NumPy, pandas, Docker, Nginx, Flask, FastAPI, Express
Concepts: Concurrency, Multithreading & Synchronization, Lock-Free Data Structures, Operating Systems, Distributed Systems, Database Systems, High-Performance Computing, Networking, Compilers