

# Austin Jiang

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## EDUCATION

### University of Waterloo

Honours Bachelor of Computer Science | Major GPA: 4.0/4.0

Waterloo, ON, Canada

Sep 2025 – Jun 2027

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

## EXPERIENCE

### Multicore Lab, University of Waterloo

Undergraduate Research Assistant (supervised by Dr. Trevor Brown) | C++, CUDA

Waterloo, ON, Canada

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

Research Intern (Wolfram Emerging Leaders Program '25) | Mathematica, Wolfram Kernels

Remote

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

Research Intern (Wolfram Emerging Leaders Program '24) | Mathematica

Remote

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