Austin Jiang

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Education

- **University of Waterloo** Waterloo, ON, Canada
  Honours Bachelor of Computer Science | Major GPA: 4.0/4.0 *Sep 2025 – Jun 2029*
  - **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