Austin Jiang

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SKILLS

Languages: C++, C, Python, Java, Bash, TypeScript, Rust

Tools/Libraries: Linux, Git, CUDA, CMake, PyTorch, TensorFlow, SQL, Docker, Nginx, Flask, FastAPI, Express

Concepts: GPU Programming, Concurrency, Lock-Free Data Structures, Multithreading & Synchronization, High-Performance Computing, Distributed Systems, Compilers, Database Systems

EXPERIENCE

Multicore Lab, University of Waterloo   Waterloo, ON, Canada
Undergraduate Research Assistant (supervised by Dr. Trevor Brown) | **C++, CUDA**   *Sep 2025 – Present*
- Implemented a **CPU lock-free data structures** baseline for controlled performance comparison.
- Migrated the build to the **CUDA toolchain (nvcc)** to resolve host-device and compiler compatibility issues.
- Developed a **VerlibAdapter abstraction** to support both **versioned and non-versioned** data structures.
- Benchmarked Verlib (PPoPP'24) extension with **10M-key** range queries under **100+ threads** on GPU.

Wolfram Research   Remote
Research Intern | **Mathematica, Wolfram Kernels**   *Sep 2025 – Present*
- Built a **parallel engine** automata handling **over 800K** units across **8 CPU cores**, achieving **1.4x speedup**.
- Developed sparse frontier updates and dense scans, achieving a **127% speedup** via load-balancing strategies.
- Designed a **benchmark harness** measuring updates per second, active ratio, and scheduling overhead.

Wolfram Research   Remote
Research Intern | **Mathematica**   *Sep 2024 – Jan 2025*
- Designed a pipeline voxelizing 3D meshes into **125K grid points**, achieving **3x GPU speedup**.
- Developed algorithms to detect unsupported and overhanging regions, increasing infill stability by **55%**.
- 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

ADaptiv, NexHacks | **Python**: Built a full video object replacement pipeline in ComfyUI, using Gemini for video understanding, Meta SAM3 for pixel-level masking, and Alibaba Wan, accelerated on RTX 4090.

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.

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.

EDUCATION

University of Waterloo   Waterloo, ON, Canada
Bachelor of Computer Science (Honours) | *Major GPA: 4.0/4.0*   *Expected May 2028*
- **Scholarships**: René Descartes National Scholarship ($25,000), President's Scholarship of Distinction ($2,500)
- **Coursework**: Data Structures, Algorithms, Development Tools

AWARDS

Meta Hacker Cup Round 2: Ranked 813th out of 13,779 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: Silver medalist x2 (6th and 7th out of 10,000+ participants).
USACO 2024 (Platinum): Achieved the highest division, ranked top 100 out of 15,564 participants.