Henry Bao

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Education

University of Waterloo — Waterloo, ON
Bachelor of Computer Science — *Sept. 2025 – Apr. 2030*

Technical Skills

Languages: C/C++, Java, Python, JavaScript/Typescript, HTML/CSS, SQL, Golang
Frameworks: Next.js, React, Node.js, Tailwind, Django, Flask, MediaPipe, Gemini, Solana, FastAPI, RESTful APIs
Developer Tools: Git, VS Code, Visual Studio, IntelliJ, PyCharm, CMake, Linux, Docker, GitHub Copilot, Claude Code, Kiro, Antigravity, Cursor, OpenClaw
Libraries: TensorFlow, Keras, PyTorch, pandas, NumPy, Matplotlib, ffmpeg, PostgreSQL

Experience

Computer Science Education Club — Aug. 2023 – Jun. 2025
Executive — *Markham, ON*

- Planned school-wide events to increase participation in the CEMC computing contest and spark interest in STEM
- Led weekly meetings and organized workshops on programming and computer science fundamentals
- Coordinated projects and coding competitions to promote student engagement in computer science
- Collaborated with teachers and peers to expand the club's resources and outreach

Math Together Canada — Jan. 2022 – Jun. 2022
Volunteer Tutor — *Markham, ON*

- Volunteered to assist struggling children around Canada with mathematics
- Provided one-on-one and group tutoring to students virtually
- Helped with assigning and grading assignments to further reinforce mathematical concepts
- Collaborated with fellow volunteers to design engaging and accessible math lessons

Projects

p2p-file-sync | *Golang, Networking* — Feb. 2026

- Built a decentralized file sync engine, utilizing Merkle Trees to achieve $O(\log n)$ state reconciliation across peers
- Optimized bandwidth and memory efficiency by implementing content-addressable storage and chunking system
- Engineered a zero-trust network layer over QUIC, using STUN-based UDP hole punching for NAT traversal

Echosign | *Gemini, Solana, RESTful API, React, Tailwind, Typescript, CSS* — Feb. 2026

- Designed a project to allow for those in distress to call for aid without Wi-Fi
- Compressed emergency messages into 24-byte semantic codes using the Gemini API
- Implemented frequency-shift keying to transmit codes using radio waves to achieve long-range communication
- Parsed the received codes using the Goertzel algorithm and the Gemini API to reconstruct malformed audio
- Validated the authenticity of the received messages by syncing it the the blockchain with Solana

Amazon Robotics Hackathon | *Python, Graph Theory* — Sep. 2025

- Optimized package routing across Amazon's fulfillment center network
- Developed a dynamic routing algorithm to account for network congestion and bandwidth
- Implemented an efficient solution to ensure real-world scalability
- Medaled among a strong field of engineers and computer scientists

YRHacks | *MediaPipe, Python, Django, Flask, Git, ffmpeg, Computer Vision* — Apr. 2024

- Developed a web application using Django for users to compare their running form with professional runners
- Explored methods to use computer vision to dissect runners' gaits
- Used MediaPipe to analyze videos and photos of running to determine potential issues

Achievements

CEMC Contests: 11 honour rolls in mathematics and computing contests including one first-place and one runner-up
MAA Contests: 2 time qualification to the selective AIME mathematics contest
Advanced Coursework: 4.0 in MATH 147 (Advanced Calculus 1) and CS 145 (Advanced Data Structures), 3.9 in MATH 145 (Advanced Abstract Algebra)