Justin Bax

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Skills

Programming Languages: C, C++, Python, TypeScript, Java, HTML/CSS, 6502 Assembly
Tech/Tools: AWS, React, Next.js, SQL, MongoDB, Linux, Docker, GitHub Actions, CI/CD

Education

University of Waterloo September 2024 — May 2029
Bachelor of Software Engineering (expected) *Waterloo, ON*

- **Academics**: 4.0 GPA, 96% academic average

Professional Experience

Software Engineer Intern May 2025 — Present
NationGraph *Toronto, ON*

- Built an autonomous scraping pipeline for **220,000** unique websites using AI agents to extract procurement information daily. Created an automatic maintenance system to re-create and fix faulty scrapers
- Improved the speed of a video clip search from **150s to 16s** by using vector embeddings and a term-frequency filter
- Created a containerization framework for web scrapers in Python, fixing **OOM** errors from 5 sources in production
- Optimized a data miner's accuracy by pairing it with a web crawler, resulting in **140,000** more bids found in 24h

AI Research Intern September 2024 — May 2025
Julie Plante Computer Science Laboratory *Waterloo, ON*

- Built and benchmarked 9 modern implementations of priority queues used in AI algorithms using **C** and **Python**
- Selected out of 2000 students to receive a 5000$ government award for college-level research

Software Engineer Intern June 2024 — September 2024
Tail'ed *Montreal, QC*

- Built and deployed a job/candidate ranking AI to AWS, leading to **30%** lower infrastructure costs than the previous iteration, using Pinecone **vector databases**, **Python**, and Cohere
- Initiated the automation of the **CI/CD** workflow (auto-build, test & deploy) with **AWS** tools and GitHub Actions
- Optimized the résumé leaderboard cache system to reduce database fetches by 60% using **Next.js** and **TypeScript**

Projects

NESRev — *C, Assembly, OpenGL* justinbax/nesrev

- Solo development of a Nintendo emulator achieving industry-level cycle accuracy. Features step-by-step execution, debugging tools, ROM file creation from assembly source code and correct graphics and audio pipeline
- Built using a custom pixel rendering engine in **OpenGL** and **C**

Spinich — *TypeScript, Next.js, MongoDB, Google Cloud API* justinbax/brebeufhx

- Development of the backend and the REST API of a **Next.js** app automating the sending of personalized cold emails
- Constant monitoring of the user's email using Google Cloud API inbox and AI analysis of the replies received
- Podium place and 3 prizes at BrebeufHx. Approached by a team of startup founders to discuss the innovative idea

SingularIO — *Python, NumPy, PyGame* Devpost page

- Developed a n-body and spacetime distortion simulation in an interactive, physically accurate environment
- Chosen out of 140 participants to win First Place prize and People's Choice award at McGill Physics Hackathon

Leadership Experience

Co-Researcher, Lead Organizer September 2023 — Present
FLOSS (Open-Source) Club *Montreal, Quebec*

- Created software to automate 63 statistical tests, leading to 9 suggestions to the Debian team, using **Python/NumPy**
- Co-researcher in a statistical study on Debian usability, resulting in a talk at a worldwide open-source conference

Additional Information

Activities: 4x hackathon winner, math tutoring, jazz ensemble leader, annual math contests, jiu-jitsu, chess, game theory