

# Justin Bax

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## Education

### University of Waterloo

*Bachelor of Software Engineering (expected)*

Waterloo, Ontario

*September 2024 — May 2029*

## Skills

**Programming Languages:** C, C++, Python, Java, TypeScript, 6502 Assembly

**Tech/Tools:** FreeRTOS, Linux, MongoDB, SQL, Next.js, AWS, GitHub Actions, CI/CD

## Professional experience

### UW Orbital

*Firmware Developer*

Waterloo, Ontario

*September 2024 — Present*

- Optimized the file system to discard unused satellite telemetry files once sent to the ground station
- Created a thermal management system and a temperature driver for the LM75BD

### Julie Plante Computer Science Laboratory

*AI research intern*

Waterloo, Ontario

*September 2024 — May 2025*

- Expected to complete a 32-week AI/ML research internship during the 2024-2025 academic year
- Selected out of 2000 students to receive a governmental grant for college-level research

### Tail'ed

*Software developer intern*

Montreal, Quebec

*June 2024 — September 2024*

- Built and deployed a candidate ranking AI using vector databases, leading to costs 30% lower than the previous iteration
- Initiated the automation of the CI/CD workflow (auto-build, check & deploy) with GitHub Actions and AWS CLI tools
- Took the initiative to add automatic unit tests, improving the test coverage from 0% to 84% on an internal API
- Singlehandedly developed and deployed a web scraping API to AWS to integrate Devpost data in the application
- Optimized the leaderboard system to reduce the amount of database fetches required by ~50%

## Projects

### SingularIO — *Winning submission for McGill Physics Hackathon 2023*

November 2023

- Development of an interactive, physically accurate n-body simulation with a visualization of space-time distortion
- Chosen out of 140 participants to win First Place prize and People's Choice award. Built with Pygame and NumPy

### NESRev — *Cycle-accurate NES emulator & Rendering engine* — justinbax/nesrev

August 2021 — March 2022

- 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 in plain C using a custom pixel rendering engine in OpenGL

## Leadership experience

### FLOSS (Open-Source) Club

*Lead Organizer, Co-researcher*

Montreal, Quebec

*September 2023 — Present*

- Co-researcher in a statistical study on the usability of Debian, resulting in a talk at a worldwide open-source conference
- Created data analysis software to automate 63 statistical tests, leading to 9 informed suggestions to the Debian team
- Organized a hardware inventory marathon, leveraging skills in command-line scripting, troubleshooting and Linux
- Hosted a technical workshop for 20+ participants on networking-related use cases for Raspberry Pi
- Organized a day-long educational unconference-style event with a libre/open-source theme

## Additional information

**Activities:** Math tutoring, jazz ensemble leader, classical trombone competitions, high ranking in annual math contests

**Interests:** Jiu-jitsu, chess, quantum physics, learning Mandarin, non-fictional prose, game theory