

# Karl-Alexandre Michaud

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## EDUCATION

### University of Toronto

Honours Bachelor of Science, Double Major in Computer Science, Mathematics

Toronto, Ontario, CA

Sep 2023 – Present

- **Relevant Courses:** Software Design, Systems Programming, Data Structures, Algorithms

## EXPERIENCE

### Software Developer

University of Toronto, Department of Computer Science

May 2025 – Present

Toronto, Ontario, CA

- Designing and maintaining core features of **PythonTA**, a static code analysis tool used by **35,000+ students** since 2016, leveraging **Python** and **Astroid**
- Optimized performance by **reducing** import time by **9.98%**, improving efficiency for **3900+ annual users**
- Extended error-detection with a new static analysis checker for infinite loops, reducing undetected runtime failures
- Developed comprehensive unit tests using **Pytest** to ensure reliability and correctness for users

## PROJECTS

### CExpress | C, Make, Homebrew

Sep 2025

- Created CExpress, a lightweight open-source **HTTP server framework** for **C** that enables rapid prototyping and web API development with minimal overhead
- Implemented key features such as **dynamic routing**, **HTTP/1.1 request handling**, **static file serving**, and **JSON API support** with an optimized memory footprint
- Delivered **cross-platform compatibility** (Linux, macOS) and streamlined installation via a **Homebrew** formula
- Produced clear, comprehensive **documentation** and examples to accelerate adoption and ease of use

### AI Video Generator | C, Python, Deepseek API, Whisper

May 2025

- Built an AI-powered **video generator** in C, automating short-form video creation through script generation, text-to-speech, subtitle syncing, and media merging
- Architected a **modular pipeline** of 5 standalone CLI tools, enabling seamless data flow via **Unix** pipes
- Developed a custom HTTP client to query the **DeepSeek API** for dynamic script generation

### Recyclobot (DeltaHacks 11) | Swift, SwiftUI, Python, Firebase, GPT-4 API

Jan 2025

- Built an AI-powered **waste management system** for real-time waste classification, promoting recycling habits
- Delivered a fully functional prototype within **24** hours, combining hardware, AI, and software into a unified system
- Deployed a functional **iOS mobile application** that processes waste data and delivers personalized sustainability tips and insights to users

### Talk To a Club | Java, Maven, JUnit, Firebase

Nov 2024 – Dec 2024

- Led the development of an interactive **social app**, simplifying club discovery and engagement for UofT students
- Implemented critical use cases and engineered scalable entities, showcasing back-end expertise
- Optimized **data pipelines** for Firebase cloud storage, ensuring efficient and reliable data retrieval
- Improved software quality by writing **45%** of unit tests and conducting code reviews

## LEADERSHIP AND INVOLVEMENT

### Event Coordinator

University of Toronto, STEP UofT Student Club

Aug 2024 – May 2025

Toronto, Ontario, CA

- Led **event planning** during the club's founding year, organizing **5 events** with **15+ attendees**
- Accelerated club growth by onboarding **25+ new members** through strategic communication and collaboration
- Secured **5 UTSL Club Award nominations** in our inaugural year by improving event logistics and delivering engaging events

## TECHNICAL SKILLS

**Languages:** Python, Java, C, TypeScript, Swift, HTML, CSS, SQL, Shell, MIPS Assembly, Makefile

**Frameworks:** Node.js, Next.js, SwiftUI, Maven

**Libraries:** React.js, Pytest, JUnit, Astroid

**Developer Tools:** Git / GitHub, MySQL, Firebase, Linux, OpenAI / DeepSeek API, Whisper