Maximilian Miller

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Education

University of Waterloo | 87% / 3.8 GPA **Sep 2024 – Present**
Bachelor of Mathematics (Co-op) | EcoCar Design Team, CS Club, Data Science Club *Waterloo, ON*

Technical Skills

Languages: Python, JavaScript, C++, Swift, Racket
Frameworks: Node.js, Flask, Express, Electron, React, MongoDB, PostgreSQL
Tools: VS Code, Git, Figma, Jupyter Notebook, Postman

Experience

ArteMed Stiftung **Sep 2023 – Present**
Software Engineer Volunteer (Part-Time) *Remote*

- Developed a Windows app using **Electron**, and **PostgreSQL** to streamline patient data management, expected to reduce manual data entry time by **60%** and enable more effective monitoring and prevention of illness outbreaks.
- Enabling Burmese doctors to track **200+** patients daily across **16** villages on the Irrawaddy river using offline software.
- Implemented offline data storage and Excel export functionality using **SQL**, will reduce manual errors by **25%**.

Google **Jun 2022**
Software Work Experience (High School) *Munich, DE*

- Developed a personalized game recommendation system using **Steam Web APIs**, **Node.js**, and **Express**.
- Improved response time by optimizing API calls with caching mechanisms and parallel processing with **Axios**.
- Worked collaboratively in a team of four following the SDLC and presented work to the Google host team.

Projects

Crypto Companion @ GeeseHacks | *Javascript, Node.js, Express, React, MongoDB* **Jan 2025**

- Developed a beginner-friendly web app allowing users to invest in Crypto in a team of four Waterloo students.
- Integrated **CoinGecko** and **Cohere APIs**, providing live data and investment advice using **React** and **Node.js**.

Spot Sense @ DeltaHacks XI | *Python, Flask, Tensorflow, Keras, Pillow* **Jan 2025**

- Led creation of a web app to detect skin cancer images using a self-trained **TensorFlow** model with **86%** accuracy.
- Integrated **Google Maps API**, and a **Cohere**-powered chatbot, providing rapid specialized skin health guidance.

Fluent Flow | *Python, Flask, Jinja2, GPT3.5, TTS, Whisper, FFmpeg* **Mar 2024**

- Built a web app that uses fine-tuned **OpenAI API models** to help users practice foreign language skills through real-time conversations with AI, supporting **15+** languages and used by **50+** users.
- Implemented real-time audio capture and processing using **FFmpeg**, reducing response latency by **20%** and enhancing conversational flow for seamless user interactions; integrated **Google OAuth**, providing secure sessions.

Uniply | *Swift, XCode, Figma* **Mar 2022**

- Developed an iOS app using to guide students through university applications achieved a **90%** user satisfaction rate.
- Designed app pages in Figma, creating a user-centered interface that streamlined university application steps.
- Built a To-Do feature to keep users on track with application tasks, boosting organization and accountability.

Extracurricular

University of Waterloo EcoCAR Design Team | *C++, Matlab, Simulink, Roadrunner* **Oct 2024 – Present**

- Developed part of the autonomous driving stack for the Connected & Automated Vehicles Team, simulating complex driving scenarios in **C++** with **Roadrunner** as part of a team of Waterloo students.
- Integrated key sensors such as **LIDAR**, and IMUs into the vehicle's system, enhancing sensor fusion and real-time data processing, contributing to an increase in sensor accuracy for autonomous navigation.

Differential Privacy Research | *Python, NumPy, Matplotlib, Tensorflow* **Aug 2022 – Nov 2023**

- Conducted **150+** hours of research on Differential Privacy, exploring how noise mechanisms enhance data privacy, optimizing the Laplace mechanism to achieve **89%** accuracy at an epsilon value of 0.2 for a high school research paper.
- Analyzed Laplace and Gaussian distributions to determine optimal privacy-utility trade-offs for secure data handling.
- Developed expertise in probability distributions and privacy-preserving methods to protect sensitive datasets effectively.

Interests | *Chess, Numismatics, Guitar, Ski Racing, Cross Country Skiing, Hiking*