Maximilian Miller

Software Engineer (AI, ML, & Data) | US Citizen | CA Work Permit Holder

382-885-3134 mtmlr101@gmail.com maxtmiller.dev maximiliantmiller maxtmiller

Education

University of Waterloo | 80% **Sep 2024 – Present**

Bachelor of Mathematics (Co-op) | CS Club, Data Science Club, Quant Club, Statistics Club *Waterloo, ON*

Technical Skills

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

Experience

Carta **May 2026 – Aug 2026**

Incoming Data Intern *Waterloo, ON*

JENLY.AI **May 2025 – Aug 2025**

Software Engineer Intern *Munich, DE*

- Developed a full-featured Microsoft Word Add-in using **TypeScript** and **React**, integrating a RAG pipeline to generate regulatory documentation drafts within enterprise regulatory workflows, increasing first-draft generation by **60%**
- Integrated **RAG**-powered methods into the core application, enabling source traceability, content quality reports, and a AI chatbot for querying regulatory documents, and generating structured outputs, reducing review time by **35%**
- Automated cloud infrastructure with **Azure Bicep**, ensuring automatic, scalable deployment on Azure App Service

ArteMed Stiftung **Sep 2023 – Apr 2025**

Software Engineer Volunteer *Remote*

- Developed cross platform patient data management app, with **Electron** and **PostgreSQL** reducing data entry by **60%**
- Enabling Burmese doctors to track **200+** patients daily across **16** villages on the Irrawaddy river using offline software
- Implemented offline storage and Excel export, reducing manual errors by **25%** for outbreak monitoring and prevention

Google **Jun 2022 – Jul 2022**

Software Work Experience (High School) *Munich, DE*

- Led the design of the personalized game recommendation system using **Node.js**, **Express** and Steam Web APIs
- Improved response time with **Axios** by optimizing API calls with caching mechanisms and parallel processing

Projects

UW Grad Graph | *TypeScript, React, Next.js, Zustand*

- Built degree progress audit engine using Hopcroft Karp $\mathbf{O}(\mathbf{E}\sqrt{\mathbf{V}})$ matching to optimally assign courses to requirements
- Designed interactive graph for **400+** courses with BFS-based topological layering and real time prerequisite evaluation
- Integrated AI assistant with structured actions, full state context, and state mutations for automated academic planning

AlphaPoisson | *Python, Pytorch, FastAPI*

- Designed and trained a **PyTorch residual CNN** chess policy–value network using board-state tensors and legal-move encoding, incorporating residual blocks, and achieving **79%** top-3 move accuracy using the Lichess Elite database
- Implemented a full training pipeline with gradient clipping, **cosine learning-rate scheduling**, MLflow logging, and alpha–beta–compatible policy outputs, optimizing inference quality under time constraints with a **8-layer** model

Sahayyo @ AI4G (2nd place) | *JavaScript, React, Express, Node.js*

- Developed an oral-first navigation platform for refugees, bypassing literacy barriers through an icon and audio workflow
- Delivers essential legal and healthcare resources, and features single-keyword inputs for local critical service discovery

PinSieve | *JavaScript, Chrome Manifest V3, IndexDB*

- Developed a RAG-based extraction pipeline that scans Pinterest boards to build persistent Taste Graphs using LLMs
- Architected local data persistence with **IndexedDB**, enabling tag-boosted user profiles and gift recommendations

Extracurricular

University of Waterloo EcoCAR Design Team | *C++, Matlab, Simulink, Roadrunner* **Oct 2024 – Feb 2025**

- Architected a multi-agent module with **RoadRunner** to simulate traffic edge cases for autonomous stack validation
- Developed a Kalman Filter sensor fusion layer for **LiDAR** and **IMU** telemetry, optimizing real-time pose estimation

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
- Analyzed optimal **Laplace** and **Gaussian** distribution trade-offs and achieved **89%** ($\epsilon = \mathbf{0.2}$) for Laplace mechanism

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