n in LinkedIn 🖸 GitHub

#### Skills

Languages/Frameworks: Python, Javascript/Typescript, C, C++, Rust, SQL, ReactJS, NextJS, NodeJS, Flask, Django Embedded/EE: Assembly, STM32, VHDL, FPGA, Verilog, PlatformIO, I2C, SPI, UART, KiCad, EE Lab Equipment ML: Pytorch, Tensorflow, Sklearn, Pandas, NumPy, Matplotlib, OpenCV, Langchain, OpenAI API, Claude Tools/DB: Git, AWS, Docker, Bash, CI/CD, API Design, Terraform, MongoDB, DynamoDB, PostgreSQL, Redis, GraphQL

# Education

## University of Waterloo

BASc in Systems Design Engineering - Mechatronics Option

# Experience

## Embedded Software Intern

Zenblen - Robotic Smoothie Making Kiosks

 Developed a real-time, closed loop stepper motor control algorithm in C++ with SPI communication on an ARM Cortex-M7 microcontroller, using encoder count to enable stall detection & self-correction, reducing machine downtime by 70%

#### Full Stack Developer Intern

Cube Exchange - Digital Asset Exchange

- Built and scaled a **mobile** web app using **Typescript**, **Node.js**, **Next.js**, **Redis** and **DynamoDB**, handling **1,000**+ daily users with a serverless **AWS** backend and Vercel-hosted frontend
- $\circ$  Designed scalable backend with **API endpoints** for real-time state updates and in-app purchases, implementing **request batching** to reduce client-side requests by 90%
- Containerized **Rust** project with **Docker**, using **incremental caching** & **multi-stage builds** to minimize image size
- Developed suite of 50 **Rust** unit tests, driving **code coverage** from 20% to **100%**, ensuring reliability

## Embedded Software Developer Intern

Gastronomous - Automated Restaurant Kitchen Robots

- Fine-tuned & deployed yoloV8 (image classification) to 99% accuracy w/ ROS2, replacing prebuilt solution saving \$3K/unit
- Developed a Python library for real-time WebSocket communication between robot's Linux-based HMI and Python middleware, enabling low-latency control and telemetry
- $\circ$  Designed signal interface **PCBs** on **KiCad**, interfacing industrial beam break sensors with microcontroller using MOSFETs
- Built robot monitoring app w/ TypeScript, Next.js & React.js, featuring live UI & camera, enabling remote diagnosis
- Deployed cloud-based SQL telemetry system for fleet-wide data tracking, enabling analysis and operational insights

## Machine Learning Intern

The Weather Network - Canada's Largest Weather Service Provider

- Built a real-time weather dashboard with **React.js**, **Node.js** & **Next.js**, integrating live data from **REST APIs** and optimizing for high-traffic scalability
- Wrote suite of unit, end-to-end (E2E) and regression tests with Cypress, Jest and Chromatic following Test Driven Development (TDD) methodology, ensuring frontend reliability for millions of users
- Developed an **agentic LLM** weather assistant leveraging Langchain and GPT-3.5, utilizing Retrieval Augmented Generation (**RAG**) targeting time series weather data, serving over **60 million** monthly users

## **Data Engineering Intern**

Toronto, ON Sep 2022 – Dec 2022

Jan 2022 - Apr 2022

Waterloo, ON

View PCB

- Trained & deployed a neural network with **PyTorch**, **AWS Lambda** & **Terraform** to classify scraped grant data into sectors, reducing manual effort and accelerating throughput by **300**%
- $\circ~$  Built a high scale data ingestion pipeline, scraping data from 4000+ web sources with  ${\bf PostgreSQL}$  & Python

## Full Stack Developer Intern

Intelliculture - Farm Management Software

Grantmatch - Grant Funding Strategy Software

• Built app w/ ReactJS & Django, processing telemetry data from farm vehicles, enabling fleet & equipment monitoring

## **Personal Projects**

Autonomous Object Finding Rover (In Progress)	how-im-building-findbot 🗹
• Building an autonomous rover with STM32, using UART, I2C, PWM & GPIO for motor and sensor control	
Windows XP Recreated With ReactJS	GitHub Repo 🗹
• Developed an exact replica of Windows XP with <b>ReactJS</b> , <b>NodeJS</b> , <b>NextJS</b> and <b>Typescript</b> , implementing complex UI	
state management to support draggable, resizable windows, multi-window applications, and a functional taskbar	
AI News Summary Web App	GitHub Repo 🗹
• Built a news summary web app using the BART LLM on HuggingFace, Flask and	PostgreSQL, deployed with Heroku

# Battery Management System and Power Distribution PCB

• Designed 4-layer PCB for 3S LiPo w/ AFE BMS for cell balancing, OCP, voltage & temp sensing, buck regulator, high-current power plane, isolated analog/digital (I2C), low-ESR capacitors & current-sensing

Waterloo, ON Sept 2021 – Apr 2026

Nov 2024 - Dec 2024

Chicago, IL

Toronto, ON

Toronto, ON

May 2023 - Aug 2023

Jan 2024 - Apr 2024

Chicago, IL

Sep 2024 - Nov 2024