

KHALIL AHMAD QAMAR

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EDUCATION

University of Waterloo

Mechatronics Engineering Co-op, Honors Bachelor's of Science | **GPA: 3.8**

September 2023 – Present

Waterloo, ON

TECHNICAL SKILLS

Software: Python, C++, C, SQL, Linux, Unix, Bash, Git, JavaScript, Java, BigQuery, Bootstrap, HTML5

Frameworks/Tools: Flask, Django, PyTorch, NumPy, Pandas, OpenCV, AWS, React, FastAPI, PostgreSQL, Pinecone, Docker

Protocols/Technologies: HTTP, I2C, SPI, UART, TCP/IP, SCP/SFTP, STM32, Arduino, Altium

EXPERIENCE

Computer Vision Research Intern

August 2025 – December 2025

Unity Health Toronto, St. Michael's Hospital

Toronto, ON

- Fine-tuned an ultrasound foundation model (UltraSam) for ICU diaphragm segmentation by curating COCO datasets with masks, implementing prompt-encoding, and inference, improving model segmentation performance by 70%.
- Improved prompt-based ultrasound segmentation by generating point and box prompts via Ground Truth clinician masks over raw frames using Python, OpenCV, NumPy, and Pandas, measured via IoU, Dice, and mAP metrics.
- Built scalable inference and evaluation pipelines in Pytorch/MMDetection/MMEngine by creating dynamic JSON COCO-style annotation workflows, reducing model evaluation time by over 15 hours/week.
- Created NumPy/Pandas/Matplotlib utilities to enhance frame image quality from RF/ENV signals and display on a GUI.
- Accelerated the lab's shift toward scalable AI-assisted ultrasound analysis for future clinical research workflows.

Software Engineer Intern

January 2025 – April 2025

Untether AI

Toronto, ON

- Built an end-to-end Python ETL pipeline for AI Accelerator data logs, automating 40+ hours/week of manual collection.
- Drove analytics for test performance against 200+ tests and total chip yield while supporting 10+ legacy log formats.
- Automated retrieval, processing, and synchronization of 2,000+ firmware logs using Linux SCP/SFTP server protocols.
- Automated log parsing and metric computation using Pandas, NumPy, and Matplotlib, delivered through an analysis GUI.
- Developed an XML schema library for 100+ chip tests, enabling dynamic test data validation and reducing data corruption.

Software Reliability Engineer Intern

April 2024 – August 2024

IKO Industries Ltd.

Brampton, ON

- Cut Plant spare parts standardization time by 30% through developing a search engine using Node.js, JavaScript, and Git.
- Derived usage analytics, metrics and insights across 35+ plants and 1,000+ daily searches using SQL pipelines in BigQuery.
- Automated 25+ manual data-entry tasks, reducing input errors by 80% and improving spare parts efficiency by 80%.

Geospatial AI Research Assistant

January 2026 – Present

University of Waterloo - Vision and Image Processing Lab

Waterloo, ON

- Analyzing foundation-model embeddings for satellite imagery in large-scale remote sensing datasets.
- Using Alpha Earth Foundations and the Google Earth Engine Python API for geospatial data querying and visualization.
- Evaluating 64-dimensional embedding vectors via similarity analysis and clustering across geographic regions

PROJECTS

PulseAI – Medical Diagnosis Assistant | [GitHub](#) | Python, Flask, AWS, Docker, LangChain, Pinecone

- Built a C-based autonomous garbage collection robot with multi-sensor object detection and pick-and-place loops.
- Achieved 95% obstacle avoidance and ± 5 cm delivery precision with a 5 millisecond response time of avoidance.

Real-Time Voice Assistant | [GitHub](#) · [Demo](#) | Python, LiveKit, FastAPI, OpenAI, CSS, HTML

- Built a real-time conversational AI Assistant using LiveKit for low-latency and OpenAI + ElevenLabs for duplex speech.
- Designed a multi-user backend with Flask/FastAPI and SQLite persistence, integrating LLM-driven intent handling.

NoteAnchor | [GitHub](#) · [Demo](#) | Python, Flask, SQLite, CSS, HTML

- Built a full-stack NoteTaking app with secure CRUD operations and user authentication via Flask-Login and SQLAlchemy.
- Created a fluid user experience with modular and responsive front-end pages using Jinja2/Bootstrap.