

KHALIL AHMAD QAMAR

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EDUCATION

University of Waterloo

BASc, Mechatronics Engineering Co-op, Artificial Intelligence Minor | **GPA: 3.8**

September 2023 – Present

Waterloo, ON

EXPERIENCE

Computer Vision Research Intern

Unity Health Toronto

August 2025 – December 2025

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

Vision and Image Processing Lab

Waterloo, ON

- Analyzing foundation-model embeddings for satellite imagery using Alpha Earth Foundations and the GEE Python API.
- Evaluating and mapping 64-dimensional embedding vectors via similarity and clustering across geographic regions.
- Evaluating LLM-based customer interaction systems using LangChain agents and constrained MCP servers.

PROJECTS

PulseAI | GitHub · Process | Python, Flask, AWS, Docker, LangChain, Pinecone

December 2025 - Present

- Built an end-to-end RAG medical chatbot grounded in textbooks and clinical literature by designing PDF ingestion, chunking, embedding, and Pinecone-based semantic retrieval pipelines for accurate context-aware responses.
- Deployed a production LLM system using Flask, LangChain, Docker, AWS EC2, and GitHub Actions CI/CD.

AI Voice Assistant | GitHub · Demo | Python, LiveKit, FastAPI, OpenAI, CSS, HTML

May 2025 - June 2025

- 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

April 2025

- Built a full-stack NoteTaking app with secure CRUD operations and user authentication via Flask-Login and SQLAlchemy.

TECHNICAL SKILLS

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

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

Protocols/Techologies: HTTP, TCP, UDP, SCP/SFTP, I2C, SPI, UART, STM32, Arduino