

Daniel Guo

236-885-9075 | dz2guo@uwaterloo.ca | [linkedin.com/in/dguo7/](https://www.linkedin.com/in/dguo7/) | github.com/allTheUsernamesRTaken | danielguo.net

EDUCATION

University Of Waterloo

Waterloo, ON

Scientific Computing and Machine Learning - Applied Mathematics

EXPERIENCE

Research Assistant

Aug 2026 – Dec 2026

SFU Intelligent Robotics Lab

Vancouver, British Columbia

- Researched and engineered **CUDA-backed Python/ROS2** 3D vision pipelines integrating VLMs and point-cloud segmentation to detect articulated object joints under Dr. Siqi Zhou for robotics.
- Optimized CPU Python/NumPy preprocessing bottleneck by **up to 14.2×** by migrating to **PyTorch-CUDA**
- Engineering AI agent evaluation frameworks for 3D objects in Python and Blender

Software Engineer Intern

May 2026 - Aug 2026

ZigZag Technologies Inc.

Toronto, Ontario (Remote)

- Built and tested software for agentic vending machines (built on **Typescript NodeJS Express REST API services**), including agent harnesses/features and runtime adapters for mapping simulated vending machine operations to the live vending machine APIs, for controlled rollout of new features.
- Built event-driven LLM agent leveraging a **LangGraph** prototype that schedules multi-step workflows from device and operator events, routes requests to various scoped tools, and handles model-provider fallback and rate limits.
- Migrated JSON based **RAG index** to **PostgreSQL and pgvector**, using **Kysely** and **PGLite** for local testing; with metadata-filtered **cosine-similarity retrieval**, benchmarked retrieval quality and latency for LLM context.
- Contributed to the open source AI harness CLI for their infrastructure library called Jingway

Software Developer Intern

April 2026 - May 2026

Legends Haul

Vancouver, British Columbia

- Automated invoice reconciliation and signature checks using **Python** with computer vision (**OpenCV + finetuned a YOLO model on PyTorch** with hard negative mining), saving up to **4 hours of manual review daily** and identifying **500+ historical data-entry errors** through backtests
- Built a **React/TypeScript** review interface with **FastAPI and PostgreSQL** to review flagged invoice form histories, review discrepancies, and save corrections.
- Implemented **Celery and Redis workers** to prevent interrupted batches and duplicate results.

Intern

June 2025 - Aug 2025

Sharpcone

Langley, British Columbia

- Worked on quote drafting tool for plastic supplier to generate customer-ready PDFs for draft quotes (incorporating pre-existing Excel-based pricing data), **saving up to 5 hours weekly**

PROJECTS

Phone Detection Roomba | *Python, OpenCV, ESP32, AWS, YOLO-V8*

- Engineered a CV pipeline: an on-device **OpenCV and YOLOv8 detector** for frame-rate phone/face tracking for minimizing network latency, plus a cloud AWS Rekognition face-recognition call to identify the person
- Implemented the patrol controller as a finite state machine using **proportional visual-servoing control** to steer the Roomba toward a target via bounding-box position.

ASCII Fluid Dynamics Simulator | *Javascript, HTML Canvas, CSS*

- Implemented Jos Stam's 1999 Stable Fluids paper's fluid simulation for my personal website danielguo.net
- Tracked density and velocity via **semi-lagrangian scheme** injected ASCII based on velocity and density

VR 3D Modelling App | *C#, Meta XR SDK, OpenXR, Unity*

- Developed with team for hackathon at Carnegie Mellon, **won Honorable Mention (out of 500 submissions)**

SKILLS

Languages: Python, C/C++, C#, TypeScript/Javascript, Java, SQL, Bash

Full Stack & Cloud: Django, React, Next.js, Node.js, FastAPI, PostgreSQL, Supabase, Tailwind, Swift

ML/Robotics: PyTorch, TensorFlow, OpenCV, YOLO, CUDA, ROS 2, ESP32

Tools/Platforms: Git, GitHub Actions, Docker, Linux, REST APIs, AWS (Lambda, S3, SQS), PowerBI, Claude Code