

Kevin Shen

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Education

University of Waterloo

Bachelor of Applied Science, Systems Design Engineering (Co-op)

Sep. 2026 – Jun. 2031

Waterloo, ON

Technical Skills

Programming: Python, C, C++, Java, JavaScript

AI & Data: pandas, NumPy, TensorFlow/Keras, scikit-learn, YOLOv8-Pose, OpenCV

Embedded: STM32, STM32 HAL, Arduino, EKF, SPI, PWM

Web & Tools: Flask, Pydantic, Gemini API, Git, GitHub

Experience

Waterloo Aerial Robotics Group (WARG)

Aug. 2026 – Present

Embedded Flight Software Member

Waterloo, ON

- Built an **STM32 motor-testing prototype** in WARG's bootcamp, translating analog input into motor commands using **C/STM32 HAL**, a 10-bit MCP3008 ADC over **SPI**, and timer-generated **PWM**.
- Working on **FreeRTOS integration** for an **SD-card logger** to capture UAV flight data for **nine-state EKF debugging** (in progress).

Graze AI

Sep. 2024 – Jan. 2025

Growth Marketing Assistant (Co-op)

Remote

- Developed a reusable, modular **record-matching workflow** in **Python/pandas** with LLMs and fuzzy matching to build **ML training data** from thousands of business records; achieved approximately **95% accuracy on manually checked records**.
- Collected business records through **web scraping** and search tools to support the matching workflow.
- Authored a **prompt engineering handbook** documenting custom instructions, AI memory, and role-based prompting for nontechnical users.

Projects

AI Flashcard Generator (Recall)

Jun. 2026 – Present

Python, Flask, JavaScript, Gemini API, Pydantic, pypdf

- Built a **Flask/JavaScript web app** that converts pasted notes, TXT/Markdown files, and **text-based PDFs** into editable flashcards with study preview and **Anki-compatible CSV export**.
- Implemented a **multi-stage Gemini API pipeline** to extract facts, audit omissions, generate flashcards, and review answers against source notes, with targeted repair for uncovered facts.
- Validated **structured model outputs with Pydantic**, checked source excerpts, and filtered duplicate or conflicting cards; generated **coverage reports** showing represented and unresolved model-identified facts.
- Implemented **background generation jobs** with progress polling, cancellation, and refresh reconnection; added bounded API retries and error handling that preserves existing cards when requests fail.

Five-Cat-PawSture

Aug. 2026

Python, YOLOv8-Pose, OpenCV, Arduino

- Developed the **Python vision workflow** for a four-person team's three-state **webcam posture monitor** using YOLOv8-Pose and OpenCV; the project won **Best Overall** at the Pearl Sullivan Engineering IDEAs Clinic Design Kickstart Challenge.
- Implemented **front/side view selection with hysteresis**, combining weighted keypoint deviations and neck/trunk angle thresholds to stabilize posture feedback as the user's orientation changed.
- Contributed **Arduino** software and 3D-printed hardware for a desktop companion displaying posture feedback through **OLED** animations.

Nuclear Leak Detection — NuclearIC Hackathon

Oct. 2026

Python, TensorFlow/Keras, FastAPI, React, TypeScript

- Built an **automated batch-training pipeline** for approximately **1.5 GB of CSV time-series data**, training a **TensorFlow/Keras LSTM classifier** to distinguish simulated reactor leak and non-leak scenarios.
- Implemented a **FastAPI inference backend** and **React/TypeScript 3D dashboard** for replaying sensor data and inspecting leak predictions within a team prototype.

Awards

Certificates of Distinction — Waterloo CEMC Fryer (2023) and Fermat (2025); top 25% in each.