

William Zeng

+1 (587) 572 9666 | [✉ w39zeng@uwaterloo.ca](mailto:w39zeng@uwaterloo.ca) | [🐙 willzeng274](https://github.com/willzeng274) | [in williamzeng274](https://www.linkedin.com/in/williamzeng274) | williamzeng.co

TECHNICAL SKILLS

Languages : Python, TypeScript, JavaScript, Rust, C++, C, SQL, Java, Golang
Frameworks : React.js, Next.js, FastAPI, Pydantic, NumPy, pandas, sklearn, PyTorch, LangChain
Technologies : Git, Docker, Kubernetes, AWS, GCP, Azure, Linux, Postgres, MySQL

EXPERIENCES

Autonomy Team Member Sept 2024 – Present
Waterloo Aerial Robotics Group Waterloo, ON

- Reduced telemetry **latency by 50%** by optimizing **MAVLink** communication with a single instance of DroneKit in **Python**
- Increased object detection **accuracy by 10%** using Ultralytics **YOLOv11** for real-time obstacle identification during test flights
- Optimized image pipelines with **OpenCV**, processing **5K+ frames** per flight and reducing data transfer overhead by **10%**
- Developed dynamic attitude indicator in **Flutter**, improving frame rate by **200%** for visualizing real-time aircraft orientation

Technical Lead Sept 2024 – Present
Google Developer Student Club Waterloo, ON

- Processed real-time data for **300+ users** with SSG-optimized onboarding platform using **React.js** and Tanstack Query
- Deployed serverless backend to handle **10K+ daily requests** using **Google Cloud** Run functions and Firestore data layer
- Implemented blogging features for **10+ writers** by building Keystatic CMS with Markdown and **Firestore** notifications
- Reached **100% code coverage** using **Bun** and Elysia.js for **20+ developers** with automated **GitHub Actions** for **CI/CD**

Machine Learning Research Assistant July 2023 – Nov 2023
Oxford University Remote, ON

- Improved stroke prediction **F1 score by 12%** on an imbalanced **medical dataset**, applying **SMOTE oversampling** and comparing performance of Logistic Regression, Random Forest, Multilayer perceptrons, and Tabular Attention Networks in **Tensorflow**
- Optimized model with **hyperparameter tuning** using GridSearchCV and bias-variance tradeoff analysis, utilizing **sklearn**
- Preprocessed **6K+ records** by applying label encoding for categorical features and median imputation for missing values, analyzing and visualizing correlations and class imbalances with **matplotlib** and **seaborn**
- Authored a peer-reviewed research paper accepted at the **DAI 2023 Conference**, mentored by Prof. Patrick Rebeschini

PROJECTS

AI-Powered 3D CAD Model Creator | *Azure* | *LangChain* | *Pydantic* | *OpenSCAD* **2nd place @ UofTHacks 12**

- Developed a **REST API** with **FastAPI** for generating models and handling follow-up prompts with **Pydantic** schemas
- Stored chat artifacts and parametric data in **Supabase**, maintaining chat history, model parameters, and attachments in **Azure**
- Built a 3D modeling pipeline using XML outputs through Anthropic **LangChain**, generating OpenSCAD code from texts and images
- Compiled OpenSCAD CLI to **WebAssembly**, running it in a **WebWorker** with a virtual filesystem for real-time STL exports

ML Face Recognition Networking Gamification App | *PyTorch* | *TorchVision* | *OpenCV* | *MongoDB* **Hacker @ DeltaHacks**

- Engineered a face identity matching system using **ResNet-18** and **torchvision** for **transfer learning**, generating 128-dimensional embeddings for **cosine similarity** matching with 60% confidence threshold
- Optimized model inference to **10 FPS** on CPU using **L2-normalized embeddings** and other performance boosting techniques
- Reduced face detection latency to **30ms at 640p** resolution by implementing **OpenCV's** multi-scale pyramid with Haar features
- Implemented vector embedding storage using **MongoDB** to persist **pickle-serialized tensors** as binary data with FastAPI

Competitive Multiplayer AI Interviewing Platform | *Tensorflow* | *Selenium* | *beautifulsoup* **Finalist @ Hack The Valley**

- Created **data ingestion pipeline** to scrape real-world interview questions using **Selenium** and BeautifulSoup
- Developed real-time video streaming for posture detection, sending **20 fps** at **1080p** using WebSockets with **FastAPI**
- Optimized cost by **reducing tokens by 90%**, synthesizing interview questions with few-shot LLM pipeline with GPT-4
- Performed facial and posture analysis of **300+ tracking points** with OpenCV, Tensorflow, and mediapipe

Eco-friendly Rewards App | *React.js* | *Remix* | *Express.js* | *Sequelize* | *Postgres* | *OpenAI* **1st place RBC @ Hack the North**

- Implemented a mobile web app with **Remix** and TailwindCSS, scoring **100%** in Lighthouse performance and accessibility
- Achieved **90%** accuracy in AI-powered receipt scanning, recognizing partners by processing structured outputs
- Won **1st place** in a sponsor track at Hack the North 2024, using **React.js** with shadcn-ui for frontend and a rewards API in **Express.js** and **Sequelize** for backend, using **Postgres** for data storage

EDUCATION

University of Waterloo Sept 2024 – May 2029
Bachelor of Applied Science in Computer Engineering Waterloo, ON

- **CGPA: 94%**