William Zeng

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Education

University of Waterloo — *Sept. 2024 – May 2029*
Bachelor of Applied Science in Computer Engineering

Technical Skills

Languages : Python, C++, C, SQL, Rust, JavaScript, TypeScript, Java
Frameworks : React.js, Node.js, Jest, Tailwind, Prisma, PyTorch, Tensorflow
Technologies : Git, Anaconda, Docker, AWS, Google Cloud, Linux, Postgres, CMake

Experience

Autonomy Software Engineer — Sept 2024 – Present
Waterloo Aerial Robotics Group — *Waterloo, ON*
- Developed a dynamic attitude indicator widget using **Flutter**, visualizing aircraft orientation from real-time data
- Implemented a FlightController class in **Python**, optimizing MAVLink communication by reducing to a **single instance**

Software Engineering Lead — Sept 2024 – Present
Google Developer Groups — *Waterloo, ON*
- Developed club website using **Tanstack** with a team of **20+**, focusing on SEO, performance, and CMS integration
- Wrote **unit** and **integration tests** using bun test for Elysia.js, ensuring API reliability for **300+** club members

Fullstack Developer — June 2024 – Oct 2024
Flash Coding — *Toronto, ON*
- Built a responsive web app with **LAMP** stack, HTML, CSS, and jQuery, working directly with the client to suit their needs
- Created a CMS with **PHP** and **MySQL** for a professional business, streamlining their content management process

Research Assistant — July 2023 – Nov 2023
Oxford University — *Remote, ON*
- Used scikit-learn and **supervised classification** to analyze **imbalanced** medical datasets under the guidance of Prof. Patrick Rebeschini, achieving an average accuracy of **97%** and wrote a research paper for **NeurIPS**
- Authored a research paper comparing supervised learning with deep learning models using **FNNs** and **TabNets**, which was accepted at the **DAI 2023** Conference

Projects

Interview Monkeys | *FastAPI* | *OpenCV* | *mediapipe* | *tensorflow* | *Selenium* | *beautifulsoup*
- Implemented multi-shot question and context **generation pipeline** with selenium, beautifulsoup, and OpenAI API, optimizing **cost** by reducing tokens up to **90%**
- Built **REST API** and asynchronous **sockets** interface with FastAPI and **pydantic**, splitting clients' sessions into rooms
- Developed video **streaming system** to backend, checking posture with cv2, tensorflow, and mediapipe at **20 fps**

ShopIvy | *Next.js* | *shadcn-ui* | *postgres* | *prisma*
- Self-developed an e-commerce platform, optimizing response times by **1-3 seconds** with serverside **caching**
- Implemented forms with Next.js **server actions**, validating schema using **zod** and state management with zustand
- Engineered item, cart, and order systems with postgres-compatible **CockroachDB**, utilizing prisma for migrations

Ghost and Cakes 3D | *Svelte* | *three.js* | *rapier_rs* | *tokio-tungstenite*
- Programmed a 3D multiplayer web-based game using Svelte, three.js and rapier_rs, creating 4 camera perspectives, mobile support, and seed-based terrain generation with 2D perlin noise, reaching **200+ players**
- Programmed real-time multiplayer backend engine using WebSockets with Rust tokio-tunsgenite, optimizing bandwidth with physics movement interpolation and state updates in **only 48 bytes**

Chesser | *Oracle Cloud* | *tailwindcss* | *zustand* | *express.js*
- Built an online chess platform using **BitBoards** implemented in TypeScript, increasing **performance** by up to **300%**
- Added stockfish bindings and multiplayer support, deploying on an **Ubuntu** instance on **Oracle Cloud**

Supervised stroke prediction | *sklearn* | *pandas* | *seaborn* | *matplotlib*
- Analyzed an **imbalanced** stroke dataset from Kaggle using pandas for data manipulation, generating **visualizations** with matplotlib and seaborn, and utilizing scikit-learn for **preprocessing, training, and testing**
- Employed LR, KNN, SGD, RandomForest, etc on analyzing the dataset, tuning hyperparameters with **GridSearchCV**