Alex Zhang

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Education

University of Toronto Toronto, ON

Bachelor of Applied Science in Computer Engineering, Minor in AI & Business *Sep, 2023 – May, 2028 (Expected)*

Experience

AI/Automation Engineer Internship May. 2025 – Aug. 2025

JuniorKids co *Remote*

- Collaborating directly with the CEO and led a team of 2 interns to develop a LangGraph-based AI agent powered by Qwen3 via OpenRouter, designed to autonomously source qualified leads using modular Python scrapers (Selenium + BeautifulSoup) tailored for ecommerce platforms.
- Integrating Gmail and Google Calendar APIs to automate personalized email outreach and meeting scheduling, reducing manual workload and accelerating lead engagement for the sales team.
- Engineering a lightweight CRM using the Google Sheets API to log interactions, manage follow-ups, and track lead statuses, providing end-to-end visibility across the sales funnel without relying on external CRM platforms.

CTO & Technical Co-Founder Mar. 2025 – Aug. 2025

TrainerIQ - DMZ Basecamp *Toronto, ON*

- Directed the end-to-end technical launch of TrainerIQ's MVP, collaborating with an external development team while contributing prototypes for future features and workflows to guide implementation and validate product direction with early users through Beta Testing.
- Managed production infrastructure, including AWS EC2 deployment, custom domain configuration, and DNS management, ensuring a stable, scalable foundation for growth.
- Strengthened founder capabilities in UI/UX design, branding, customer discovery, and market strategy through DMZ workshops, applying them to shape MVP feature priorities, align engineering decisions with market needs, and design TrainerIQ's logo, color scheme, and marketing website.

Software Engineer Internship Jan. 2025 – Apr. 2025

Savi Finance *Toronto, ON*

- Collaborated with a team to develop an AI-powered PDF parsing pipeline, expanding the upload options beyond CSV files, increasing flexibility, and improving the overall customer experience.
- Implemented middleware to validate backend API inputs by checking file type (PDF), size limits, and format compliance, ensuring robust data integrity and preventing invalid or malicious file uploads.
- Utilized TypeScript to implement UI fixes such as consistent header capitalization, improving visual consistency and user experience while gaining hands-on experience with front-end development.

Electrical Team Member Sep. 2024 – Mar. 2025

Robotics for Space Exploration (RSX) - University of Toronto *Toronto, ON*

- Designed and built a custom single-layer LED PCB in KiCAD to display rover subsystem signals; owned schematic/layout design, component selection, and signal mapping.
- Developed a PyQt GUI to generate and send mock signals to the PCB, enabling functional testing and faster validation of the Arduino shield interface.
- Hand-soldered and tested boards with voltmeter/oscilloscope, conducted battery load tests, and collaborated with new members to assemble units, one of which was later integrated on the rover.

Full-Stack Web Developer Oct. 2024 – Dec. 2024

UTRA Hacks - University of Toronto *Toronto, ON*

- Collaborated with a team of five to build the official website for UTRA Hacks 2024, used for real hackathon applications.
- Developed the front-end of the application form using Next.js and TypeScript, coordinating closely with backend developers.
- Used Git for version control to manage tasks, streamline collaboration, and track progress.

Projects

CityScope (ECE297 Project) | *C++, OpenStreetMap API, EZGL* May 2018 – May 2020

- Collaborated in a 3-person team to develop an interactive C++ GIS app with OpenStreetMap data and EZGL rendering, enabling users to zoom, pan, and search points of interest.
- Implemented A* and Dijkstra's algorithms to compute optimal routes, delivering fast and accurate pathfinding.
- Designed multithreaded metaheuristic solvers (2-opt, simulated annealing, hill climbing) to solve the Traveling Salesman Problem in under 5 seconds.
- Integrated libcurl-based HTTP module to fetch and parse real-time JSON weather data, enhancing contextual relevance.

Waveform Synthesizer (ECE243 Project) | *C, RISC-V, FPGA (DE1-SoC)* Mar. 2025 – Apr. 2025

- Developed a real-time waveform synthesis engine in C on a RISC-V soft-core mapped to the DE1-SoC FPGA, enabling polyphonic generation of sine, square, sawtooth, and triangle tones with both additive and subtractive synthesis.
- Implemented ADSR envelopes utilizing point-wise exponential amplitude modulation layered over base waveforms, resulting in dynamic control over attack, decay, sustain, and release characteristics.
- Integrated a PS/2 keyboard as a MIDI controller and built an on-board graphical oscilloscope interface displayed using VGA standard and navigated via DE1-SoC buttons/switches, providing users with intuitive control and real-time visual feedback of their custom sound patches.

Autonomous Sensor-Guided Robot Car (UTRA Hacks) | *Arduino, Embedded Systems* Feb. 2025

- Built an autonomous robot car for a hackathon to navigate color-coded obstacle courses without human input, achieving reliable self-driving behavior using embedded sensors and real-time controls.
- Connected ultrasonic distance sensors, color sensors, and DC motors to an Arduino microcontroller, enabling environmental awareness and motion control through sensor-actuator integration.
- Programmed Arduino firmware to interpret sensor data, detect colored track markers, and control motor output logic, allowing the robot to make real-time navigation decisions like lane following, turning, and obstacle avoidance.

Sequence Memorization (ECE241 Project) | *Verilog, FPGA (DE1-SoC), ModelSim* Nov. 2024 – Dec. 2024

- Designed and Implemented the game logic with Verilog on FPGA with a partner, integrating components such as exterior inputs, VGA display, and On-Chip memory with ROM modules
- Delivered results through milestone-based planning and detailed ModelSim simulations, ensuring efficient communication and progress-tracking between members
- Utilized Git for version control to manage code changes, ensuring efficient teamwork, streamlined code management, and enhanced project tracking, leading to smoother development and fewer conflicts during collaboration

Diabetic Retinopathy Detection (APS360 Project) May. 2024 – Jul, 2024

- Fine-tuned a pretrained CNN on a competition dataset, achieving F1, precision, and recall scores that surpassed the benchmark by 10%.
- Conducted data preprocessing and analysis using NumPy/Pandas, applying augmentation techniques and transfer learning with fully connected layers to improve model generalization.
- Collaborated in a team of 4, dividing tasks across data pipeline, model design, and evaluation, while hosting code reviews and progress syncs.

Technical Skills

Languages: C, C++, Python, Java, JavaScript, TypeScript, Verilog, HTML, CSS
Frameworks:React, Next.js, Tailwind CSS, Bootstrap, Node.js, Express.js, Flask, Django
Developer Tools: Git, Docker, AWS, VS Code, Cursor, Vercel, Supabase, Figma, Anaconda Stack, KiCad, LTSpice, Quartus Prime, ModelSim, DESim
Libraries: PyTorch, NumPy, Pandas, Jupyter Notebooks
APIs & Services: OpenAI API, Google API, Twilio, RESTful APIs, Supabase