Jianhao (Jacky) Zhao

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Skills

- Software Programming Languages: C++, C, Python, Java, JavaScript, Assembly, Verilog
- Web development: React.js, Node.js, API Integration, HTML, CSS
- Performing board debugging with oscilloscopes, DMMs, waveform generator, etc.
- Circuit Design (KiCad, Altium)
- Machine Learning: PyTorch, TensorFlow, Scikit-learn, Pandas

Education

University of Toronto - Toronto, ON *Sept. 2023 – Apr. 2028 (PEY)*

B.A.Sc. in Computer Engineering + PEY Co-op

Minors: Artificial Intelligence, Engineering Business

Relevant Courses: Applied Fundamentals of Deep Learning, Data Structures and Algorithms, Computer fundamentals (C/C++), Operating Systems, Digital Electronics, Digital Systems (Verilog), Introduction to Electronic, Computer Network, Analog Electronics, Computer Organization

Curricular Experience

AI Sports Analyst Team Leader – Toronto, ON *May. 2025 – Aug. 2025*

Course: Applied Fundamentals of Deep Learning (APS360)

- Engineered a multi - staged model (YOLOv11 + ResNet-18 + LSTM pipeline) that predicted penalty outcomes (6 classes) with **~61% accuracy** on **unseen** soccer penalty footage, proving feasibility without explicit ball tracking.
- Collected and preprocessed soccer video datasets, enabling robust object detection of players and ball in challenging sports footage where datasets are scarce.
- Deployed the trained model as a Streamlit web app, allowing real-time interactive demonstrations for coaches, analysts, and classmates.
- Delivered technical report and presentation that communicated complex ML methods to non-experts.

Project Manager – Toronto, ON *Jan. 2025 – Apr. 2025*

Course: Software Design and Communication (ECE297)

- Developed an efficient GIS-based courier routing system that optimized delivery routes across thousands of city intersections that achieved **~78% reduction in delivery time** compared to baseline.
- Developed an interactive city mapping application in C++, leveraging EZGL and GTK for graphics rendering and user interface.
- Integrated OpenStreetMap (OSM) and Google Places APIs to display real-time points of interest, including restaurant info like cuisine and open status. Built an interactive GUI with features such as street name search, intersection highlighting, and zoomable maps.
- Designed a user-friendly GUI with features like street name search, partial name matching, clickable intersections, and visual route display.

FPGA Game Designer – Toronto, ON *Mar. 2025 – Apr. 2025*

Course: Computer Organization (ECE243)

- Built a 2D platformer game inspired by Super Mario using embedded C on a Nios V processor running on an Altera DE1-SoC FPGA board.
- Handled game logic, state transitions, and player-object interactions using custom finite state machines (FSMs).
- Implemented VGA output to render game objects, character movement, and collision events using memory-mapped graphics.
- Demonstrated proficiency in embedded C, low-level memory management, and hardware-software interfacing.
- Used Git for version control and collaborated effectively in a team-based development workflow.

FPGA Game Designer - Toronto, ON *Oct. 2024 – Nov. 2024*

Course: Digital Systems (ECE241)

- Designed and implemented the game logic for a Connect 4 game on an FPGA using Verilog (VHDL).
- Developed a VGA module to render the game board and dynamically display player moves in real time.
- Implemented win condition detection (horizontal, vertical, diagonal) and visual feedback using HEX displays.

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Extracurricular Experience

Electrical Team member, SAE Aero Design Team – Toronto, ON Sep. 2024 – Present
University of Toronto Aerospace Team (UTAT)
- Won the 1st place design report award at the 2024, 2025 SAE Aero Design West competition.
- Won the 5th place Overall in 2024, 2025 SAE Aero Design West competition (Advanced Class)
- Focus areas: Sensor and computer integration, Motor testing and motor-propeller matching, Circuit design and integration
- Collaborating on a custom PCB (flight controller) design with Altium to minimize 38% of plane weight and enhancing electrical system stability and performance

Website Backend Researcher - Toronto, ON
University of Toronto ECE department *May. 2024 – Aug. 2024*
- Collaborated with a professor in the ECE department to enhance a backend system powering a website that supported **200+ students** in the faculty.
- Developed and deployed a Discord bot using discord.py and integrated with the Discord REST API to automate workflows, manage slash commands, and streamline communication across class channels to improve student engagement.
- Built and maintained backend features with Django ORM for efficient storage, querying, and retrieval of anonymous messages, while ensuring secure API key and token management for safe configuration.

University of Toronto Robotics Association 2025 Hackathon - Toronto, ON *Feb. 2025 – Feb. 2025*
- As a team of 6, We built AeroCare — an AI-powered drone delivery system designed to autonomously detect and deliver medical packages.
- Uses OpenCV + YOLO to detect dropping zones via an ESP32-CAM and communicate with Arduino Uno to activate Stepper motor control.
- Work with sensors such as barometer and ultra sonic sensors with Arduino UNO to activate the parachute releasing mechanism.

Personal Website Development - Toronto, ON *Dec. 2024 - Present*
- Designed and developed a personal portfolio website from scratch to showcase projects, skills, and achievements.
- Utilized HTML, CSS, JavaScript, React to build a responsive, user-friendly design optimized for various devices.

University of Toronto Robotics Association 2024 Hackathon - Toronto, ON *Jan. 2024 – Jan. 2024*
- My team and I built a plant optimization device that will demonstrate the soil moisture level and offer plant care suggestions for farmers or plant enthusiasts to better take care of their plants.
- Information will be output to the LCD display screen and input data is retrieved from a soil moisture sensor and temperature sensor, photodetector and NTC Thermistor Temperature Sensor. Software Programming is done with C++ and is transmitted to sensors by Arduino Uno.
- Received positive feedback and suggestions for improvement from the judges.

Self - recoverable Rocket design team leader - Vancouver, BC *May. 2022 - May. 2023*
- Manufacture of Rocket design with Fusion 360.
- Circuit Design (power system)
- Launching and navigating control programming
- Outreaching for presentations and external resources
- Presenting our project to the public representing the school tech department

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Volunteering Experience

Science World - Vancouver, BC *Jun. 2022 – Jul. 2022*
Science Facilitator assistant
- Help Science Facilitators to offer visitors a memorable experience at Science World.
- Assist with customer service supporting visitor's experience.
- Explain Science-related knowledge and theory from each gallery at Science World to the visitors.

Vancouver Youth Symphony Orchestra - Vancouver, BC *Sep. 2019 – Mar. 2023*
Orchestra practice and performance preparation assistant
- Making sure the preparation of each rehearsal is done and fit conductor's requirement.
- Coordinating and planning rehearsal and yearly performance locations and logistics.