Eric Wu

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Skills

Programming: C++, Python
Robotics & Controls: ROS 2, PID, Pure Pursuit, Odometry, Arduino, I^2C
CAD & Manufacturing: SolidWorks, Fusion 360, AutoCAD, Lathe, Mill, 3D Printing

Experience

WATonomous   Jan 2026 – Present
Software Engineering Member   *Waterloo, ON*

- Deployed a **ROS 2 autonomous navigation stack** combining LiDAR-based costmaps, obstacle inflation, and global planning; tested and debugged behavior in Foxglove
- Processed raw LiDAR scan data into a **2D occupancy grid**, applying distance-based obstacle inflation to keep planned paths collision-free
- Implemented and tuned an **A* global path planner** to produce reliable paths around static obstacles

University of Waterloo Formula Electric   Sept 2025 – Present
Suspension Team Member   *Waterloo, ON*

- **Machined 20+ suspension components to a ±0.05mm tolerance**, including spacers, top hats, and assembly jigs for the Formula SAE Car
- Operated manual **mills and lathes** to machine aluminium and steel suspension components, including plates, L-brackets, spacers, rod plugs, and top hats, with precision drilling and countersinking for flush-mounted hardware
- Designed **3D-printed** piston mounts for the front damper system, reducing vibration during vehicle operation

Churchill Robotics   Sept 2022 – May 2025
Mechanical Lead – VEX Robotics Team 3388C   *Calgary, AB*

- **Top 10 national finish and top 2% overall among 20,000+ teams**, including 1st and 3rd place finishes at the 2024 and 2025 Alberta Provincial Championships
- Designed and prototyped fully defined **SolidWorks assemblies** for drivetrains, shooters, and climbing mechanisms
- Iterated over **12+** competition-ready robots, reducing weight and improving mechanical efficiency while maintaining reliable structural rigidity

Projects

Sensor-Based Arcade Machine   Nov 2025
Personal Project   *Waterloo, ON*

- Developed a centralized, multi-Arduino **leader–follower I^2C control structure** coordinating communication between distributed IR and ultrasonic sensors with real-time scoring displays
- Designed custom 3D-printed sensor and motor mounts in **SolidWorks**, integrating brushless DC motors to implement an **automated ball-return mechanism**
- **Improved scoring accuracy by 35%** through sensor calibration, debouncing, and timing-based filtering
- Awarded **Best Game Overall** at BoxBots Hackathon out of 60+ competing teams

X–Y Odometry and PID Controller   Feb 2025
Churchill Robotics   *Calgary, AB*

- Designed space-efficient, **laser-cut** X–Y odometry shells in Fusion 360, resulting in a **robot width reduction** of over 1.5 inches.
- Implemented a **Pure-Pursuit algorithm** and fine-tuned PID controllers, **increasing autonomous-routine success rates by ~45%**
- Used odometry feedback to improve autonomous path efficiency and repeatability

Education

University of Waterloo   Waterloo, ON
B.ASc in Mechatronics Engineering   *Expected Graduation 2030*

- **Certifications:** Certified SolidWorks Associate