

## Education

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**University of Waterloo** - BAsC, Mechatronics Engineering Sep 2024 - Apr 2029

- Ted Rogers Entrance Scholarship, George A. Ward Scholarship, and President's Scholarship of Distinction

## Skills

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- **Mechanical:** SolidWorks, Catia 3DX & V5, FEA, Fusion 360, AutoCAD, GD&T, DFM/A, Tolerance Stack-Up, Prototyping
- **Tools:** 3D Printing, Fabrication (Mill, Lathe, Drill-Press), Welding, CNC, Soldering, Multimeter, Oscilloscope
- **Software:** Python, C++, Java, Raspberry Pi, Arduino, ESP32, MATLAB, I2C, UART, MQTT, SQL, PostgreSQL, Git, Bash

## Experience

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**Mechatronics Design Intern - Seatbelts** - Tesla - Fremont, CA Jan 2026 - May 2026

- Developed a lifecycle test machine in Catia 3DX using aluminum extrusions and 3D-printed fixtures to test a seatbelt component over 75,000+ cycles, ensuring DFA and maintainability.
- Selected and integrated a BLDC motor and controller for lifecycle test hardware meeting calculated load requirements.
- Developed a custom C++ UART communication interface to control the motor driver using an MCU, implementing the message framing protocol for reliable command transmission and response handling.
- Implemented and tuned a cascaded PID control system to achieve precise closed-loop position control of the motor.

**Mechatronics Engineering Intern - R&D** - Martinrea International - Vaughan, ON May 2025 - Aug 2025

- Implemented the company's first autonomous mobile robot (AMR) system into a metals plant, enabling reliable transport of 4,000 lb/hour; built supporting hardware and control software.
- Designed 6 AMR-compatible material carts used to transport over 1300lbs of parts to production lines, using SolidWorks FEA to reduce frame weight and ensure safe operation with AMR, preventing tipping. Produced engineering drawings for fabrication, implementing DFM/A principles.
- Automated low-stock replenishment, summoning AMR deliveries to production lines when material runs low, using a Raspberry Pi, selecting hardware and wiring circuitry, as well as writing a Python script using MQTT to communicate.
- Implemented a PostgreSQL telemetry database to collect AMR mission and sensor logs, and developed a Python script utilizing MQTT for log ingestion and SQL queries for analysis.
- Presented autonomous intelligent vehicle team systems to investors and guests, communicating design justifications, technical features, and operational benefits, to drive stakeholder confidence.

**Mechanical Dynamics Member** - Midnight Sun Solar Car Team - Waterloo, ON Sep 2024 - Present

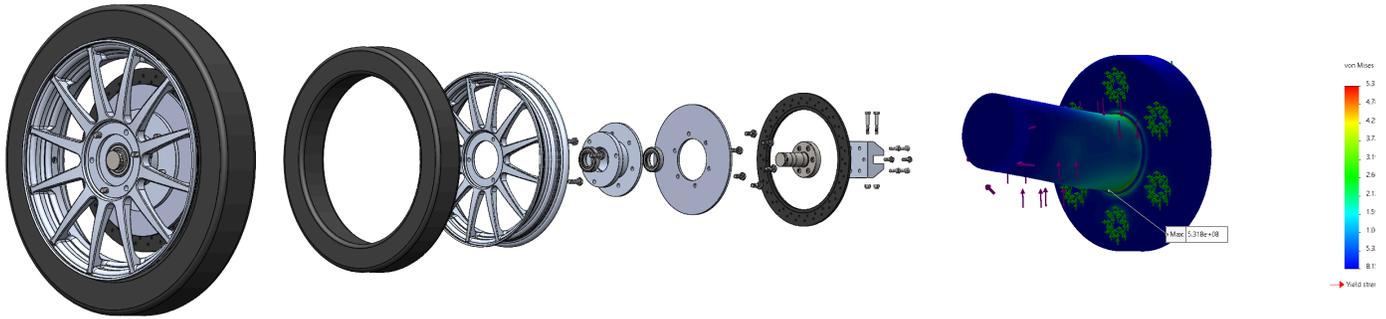
- Developed a rear wheel hub using SolidWorks, securely attaching the car wheel to the suspension arm, reducing overall mass by 65% while maintaining structural integrity under static, acceleration, and braking load conditions.
- Implemented DFM/A principles to lower production complexity, optimize part geometry, and minimize part count.
- Conducted linear static FEA simulations on rear suspension parts to validate structural integrity, ensuring all components meet safety factors and competition regulations while identifying areas for weight reduction.
- Created engineering drawings for the rear wheel hub assembly using ordinate dimensioning and GD&T, ensuring manufacturability.

**Team Captain & Mechanical Lead** - Wolfpack Robotics - Markham, ON Sep 2020 - Jun 2024

- Led a robotics team of 80+ members, teaching mechanical design and programming while overseeing administration.
- Engineered competition robots, designing a transmission, slip-gear catapult, drivetrain, and pneumatic climbing system.
- Developed and taught a curriculum on engineering fundamentals, teaching Fusion 360, drivetrain and lift design, prototyping, and manufacturing to 35+ members weekly.
- Pitched sponsorship opportunities to businesses, securing over \$13,000 in funding and actively managing sponsor relationships.

## Rear Wheel Hub - Midnight Sun Solar Car Team

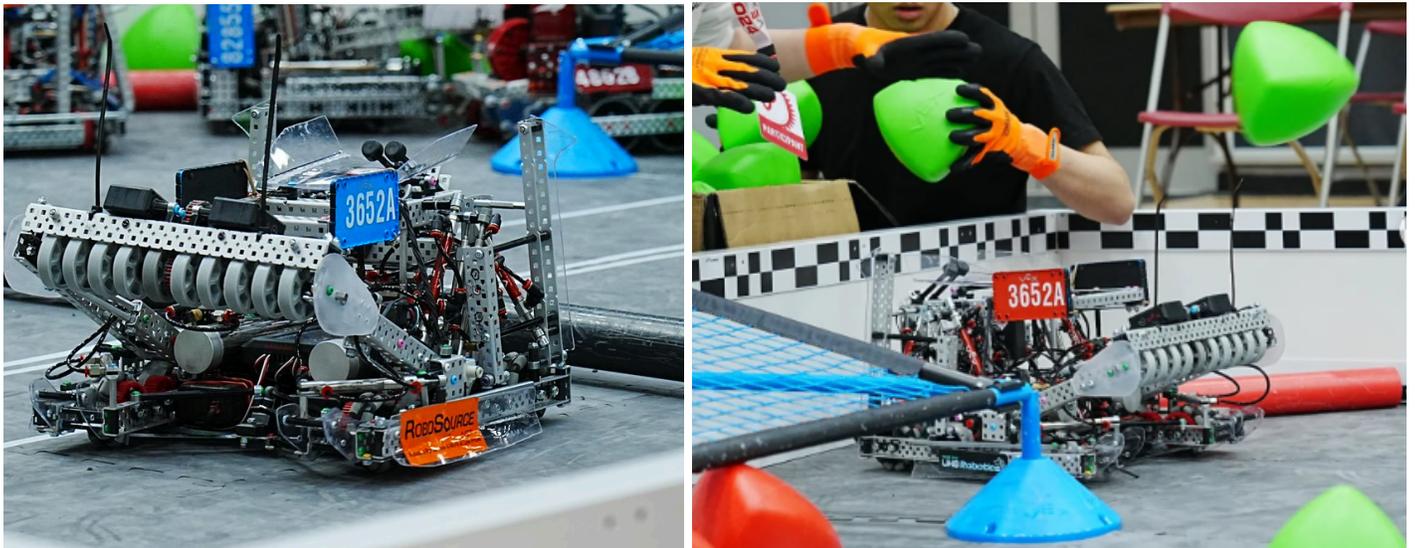
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- Designed a rear wheel hub to replace one of the two rear motors in the MS15.5 solar car, reducing weight and improving energy efficiency based on FSGP 2024 insights.
- Engineered a rear wheel hub using SolidWorks, conducted FEA simulations to ensure a 2X safety factor, and applied DFM/A principles to simplify manufacturing.
- Developed detailed GD&T technical drawings to ensure accurate machining, assembly alignment, and compliance with ASC regulations.

## VEX Robotics Team 3652A, 2023 - 2024 Competition Robot

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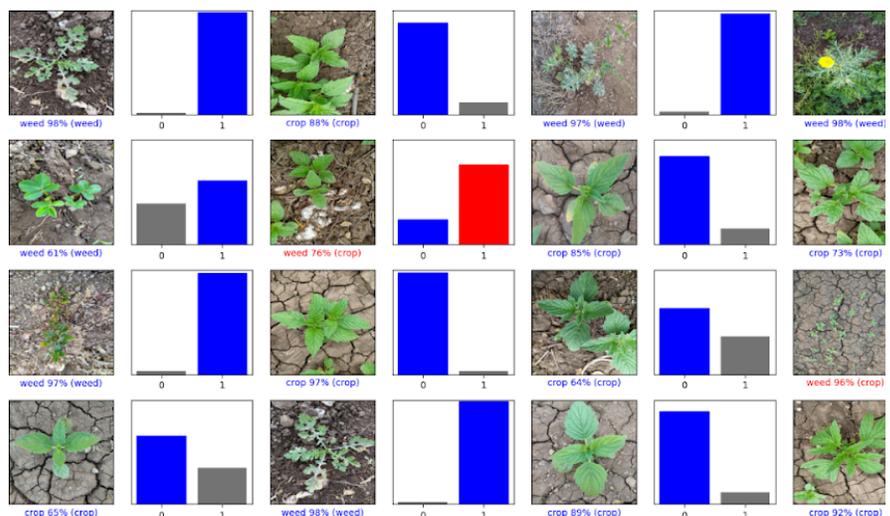
- Engineered 3 robot iterations using Fusion 360 for the VEX Robotics Over-Under Competition, designed to complete game tasks of hanging on a pole, launching game elements, scoring game elements beneath the goal, and operating during a 15-second autonomous period.
- Designed a 6-motor inline omni-wheel drivetrain with a 3:4 gear ratio reaching a maximum of 450 rpm.
- Developed a slip gear catapult capable of launching 2 elements per second.
- Engineered a pneumatics net scoring mechanism and hanging mechanism capable of holding the 20lb robot.

## VEX Robotics Team 3150A, 2022 - 2023 Competition Robot



- Engineered 6 robot iterations for the VEX Robotics Spin-Up Competition using Fusion 360, designed to complete the game tasks of scoring disks in the net, spinning rollers, maximizing the surface area covered, and operating during a 15-second autonomous period.
- Developed a flywheel disk shooter operating at 3600 rpm and a disk intake operating at 600 rpm, powering 5 rows of rollers transporting the disks from the ground to the flywheel.
- Manufactured metal and polycarbonate parts using tools such as a bandsaw, drill press, belt sander, angled grinder, CNC Machine, and 3D Printer.
- Won over 11 tournament awards, including being crowned Ontario Provincial Champion.

## Automated Weed Removal Robot - DeltaHacks 12 Project



- Developed a proof-of-concept autonomous robot to identify and eliminate weeds using a laser.
- Utilized a Raspberry Pi, a custom neural network for weed detection, and a laser system to detect, locate, and shoot weeds while navigating crop rows autonomously or via a remote control web app.
- Built a mobile robot with a dual-servo laser turret, H-bridge-powered drivetrain, and soldering circuitry together.
- Selected as a finalist and invited to present the project to an audience of over 300 participants.