ERIC ZHAO

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SKILLS

Languages | C++, Java, Python, HTML, CSS, JavaScript
CAD | Solidworks, Fusion360, AutoCAD, Tinkercad, GrabCAD, GD&T
Other Skills | Arduino, Git, CircuitMaker, Ultimaker Cura, Microsoft Office, Jira, Altium, Figma, Adobe Creative Suite

WORK EXPERIENCE

Electrans Technologies Ltd.
May 2021 - Sep 2021

Mechatronics Engineering Intern

- Utilized **MAHD** principles over four months to complete the first prototype of AutoConnect, an automated trailer hookup system.
- Initiated and completed several projects to aid and streamline the development and testing of the AutoConnect.
- Created enclosure boxes, board mounts, and wiring harnesses for all electrical components for the AutoConnect.
- 3D printed custom designed mounts to secure communications hardware to laptops for easy and mobile outdoor testing.

PROJECTS

Tandem Dolly Monitor
Aug 2021 - Sep 2021

CircuitMaker, Fusion360, C++, Arduino

- Designed a custom PCB to monitor and display the AutoConnect's state of charge, battery voltage, and current draw.
- Soldered, wired, and mounted system with an emergency stop box for easy monitoring, reset, and shut down of projects.
- Modified a Serial CAN Bus Module to mask and filter extended frame CAN bus messages transmitted by an electric dolly.
- Designed circuit to measure and scale voltages from up to **50V** to appropriate Arduino analog signals with a resolution of **49mV**.
- Ordered appropriate current sense amplifiers and shunt resistors to measure up to **12.5A** of current with a **12mA** resolution.

Tractor Trailer Misalignment Detection System
May 2021 - Sep 2021

C++, Arduino, Fusion360

- Designed and constructed system to measure misalignment angles between a tractor and trailer to line up the AutoConnect.
- Utilized infrared time of flight sensors to measure and display yaw misalignment with up to **1.4 degrees** of accuracy.
- Programmed LED lighting display to provide feedback to drivers on how to adjust their vehicle to improve their alignment.
- Prototyped cab display with a button to simulate the driverside automated hookup activation stateflow.

Distance Sensor Testing System
May 2021 - June 2021

Fusion360, Microsoft Excel, C++, Arduino

- Constructed a testing fixture with custom 3D printed parts, aluminum extrusions, and swivel tripods, to mount, test, and collect data on sensors and sensor configurations at various angles with up to **1 degree** precision.
- Created a decision matrix to select the most appropriate technology out of ultrasonic, infrared, and LiDAR distance sensors.
- Analyzed data on sensor measurements using normal distributions and tolerance stackup analysis to select the optimal sensor.

Circuit Board Mounts
Oct 2020 - Dec 2020

Solidworks, Adafruit MakeCode, Microsoft Word

- Led a team of 4 to design and produce a professional report, bill of materials, and CAD model for a fully functional conveyor system which autonomously identifies and sorts packages.
- Used Solidworks to design the frame of the conveyor and Adafruit MakeCode to run simulations of the sorting software.

EXPERIENCE

Midnight Sun Solar Car Team
Battery Box and Interiors Team Member
Jan 2021 - Present

- Conducting research into various production methods, including support filament, heat set inserts, and mounting procedures.
- Leading the development of new board mounts for the printed circuit boards of the solar powered car.
- Prepared a fully retractable and compact cup holder within a one-week design sprint.

EDUCATION

University of Waterloo
Sep 2020 - Apr 2025

Candidate for BASc, Mechatronics Engineering
Cumulative GPA: 93.77 (4.0)

AWARDS

First in Class Engineering Scholarship
Feb 2021

Presented to the top student of the class during each term.