Nathan Li

Mechatronics Engineering | n63li@edu.uwaterloo.ca

Technical Skills

Mechanical: SolidWorks, AutoCAD, Fusion 360, ArtCAM, machine shop expertise

Electrical: EAGLE, Altium, soldering, crimping, PLCs

Software: C++, C, Java, Assembly, Python, G-Code, MATLAB

Relevant Experience

Electrical Engineering Coop – AXYZ International *Jan 2018 - Apr 2018*

- Created custom parts to improve the function of a photoelectric sensor using **SolidWorks**
- Manufactured and wired a jig to test the conformance of 5 and 10 horsepower motor spindles
- Developed wiring manuals for a material offloading conveyor and indexing material lifter

Junior Process Engineer - Morgan Solar *May 2017 - Sep 2017*

- Programmed a 3-axis CNC gantry to dispense silicone on solar cells with **Python and G-Code**
- Designed custom-built vacuum fixtures for soldering bus bars onto solar cells using **SolidWorks**
- Developed QA programs to measure project conformance on a coordinate measuring machine

Energy Systems Member – FIRST Robotics *Sep 2013 - Jun 2016*

- Controlled robot movement using the roboRIO controller interfaced with motor controllers
- Designed custom game piece manipulators using solenoids to fire and retract pistons
- Wired, crimped and integrated the electrical and pneumatic subsystems of three different robots

Projects

Autonomous Robot Racing Challenge *May 2018 – Present*

- Produced a robot capable of navigating twisting, obstacle-filled courses without human input
- Created a 3D-printed clevis mount and camera housing for machine vision using **Fusion 360**
- Increased safety of robot by designing a 3D-printed e-stop button platform in **Fusion 360**

Audio Amplifier PCB *Sep 2017 – May 2018*

- Created an audio amplifier PCB using an LM386 op-amp with filtering and decoupling
- Designed the schematic and the board layout using **EagleCAD and Altium**
- Produced a working prototype by soldering electrical components onto a custom PCB

Rotary Caliper Measurement System *Nov 2017 - Dec 2017*

- Created a rotary caliper measuring system to measure the diameter of common Canadian coins
- Designed **in Fusion 360** and fabricated pieces from acrylic using a laser cutter
- Interfaced a photoresistor with an **Arduino** to measure rotation angle and convert to distance

Line Following Music Player *Sep 2016 - Oct 2016*

- Constructed a robotic music player that plays notes based on the intensity of a grayscale line
- Created a custom Lexan three-wheel omni-drive chassis in **SolidWorks**
- Designed a circuit to generate sound using a digital-to-analog converter and low-pass filter

Education

- B.A.Sc. Mechatronics Engineering *Expected 2021*