Christian Malherbe

3rd Year Engineering Physics
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Skills

Computer	Python, C, C++, Java, Git, GitHub, MATLAB, Linux, ROS, Neural Networks, SolidWorks, Onshape.
Electrical	Circuit Design/Analysis, Oscilloscope, Multimeter, PIDs, Microcontrollers. Current coursework in NI Multisim and with VHDL for FPGAs
Lab Skills	Data aquisition, Data/Error Analysis, Graphing and Data visualization
Machine Skills	Hand tools, 3D printer, Laser and Waterjet Cutter, Breadboard Prototyping and Soldering

Technical Work Experience

Physics Teaching Assistant
University of British Columbia, Vancouver **January – April 2021**

- Teaching assistant for a physics lab course. Guided and answered questions for students relating to debugging circuits, setting up and using microcontrollers, collecting and analyzing data in Excel, and reporting measurements.

Instrumentation Engineer COOP –
Precision Nano-Systems, Vancouver **January – May 2020**

- Designed and created a fully functional PC operated jig for automating the process of testing liquid pump load capacity. Project involved sourcing and assembly of mechanical and electrical components such as sensors and fluid lines, as well as generating CAD models and 3D printing components. Wrote a robust Python script with an in-depth user interface for communicating with pumps over RS-485 serial communication, and for collecting, analyzing and displaying pressure data.
- Sourced, calibrated, and embedded sensors into a heated fluid line to understand and model temperature of flow. Analyzed data in Excel and Python to generate a solution for maintaining fluid temperature.

Technical Project Experience

Self-Driving Car Project – UBC, Vancouver **September – December 2020**

- Machine learning and computer vision project involved controlling a robot in a world simulated using the Gazebo Gym physics engine.
- Software developed using ROS in Linux and written in Python. Classical computer vision techniques used to guide robot around a track while avoiding pedestrians and other vehicles. Neural Networks used to find the license plates of parked cars, recognize the characters on the plate and log them to a database.

Engineering Physics Robotics Competition – UBC, Vancouver **July – August 2020**

- Designed and built a fully autonomous robot which used sonar, infrared detection and light reflectance sensing to locate and retrieve cans for recycling
- Electrical system included H-bridge motor driver, IR detection and filtering circuit, power conditioning and voltage regulation for sensors, motors and other loads. Mechanical design involved a four bar linkage mechanism for raising and tilting a platform. Software in C++ on an STM32 “Blue Pill” board used PID control and interpreted data from multiple sensors for guiding robot.
- Robot came 4th overall out of 16 teams competing.

Piano Playing Robot – UBC, Vancouver **January 2019 – August 2020**

- Developed a mechanical hand for a robot capable of reading and playing high level piano pieces on a full sized piano. Worked on a timing belt drive as well as a rack and pinion system for moving hand up and down keyboard.
- Designed parts and assembly in SolidWorks, breadboarded electronics for actuating solenoids and driving motors. Wrote software to control robot using an Arduino Microcontroller.

Induction Heater – Kitsilano High School, Vancouver **May – June 2018**

- Built an induction heater which converted the current from a DC power supply into a high frequency oscillating AC using a ZVS driver.
- Worked off and improved a poor schematic, sourced parts and supplies, and soldered circuit together.

Blind Rod Assistive Device – UBC, Vancouver **November 2018 – February 2019**

- Constructed a device capable of allowing a paraplegic man with extremely limited arm mobility to open and close the blinds in his home and office.
- Designed using SolidWorks, presented project in the form of a PowerPoint and a narrated video.
- Project placed first out of over 950 engineering students competing.

Non-Technical Work Experience

1-800-GOT-JUNK Driver and Salesperson - Vancouver **April – September 2019**

- Worked many long hours doing difficult work and up to 8 jobs per day, and managed tight work schedule and time constraints. Used critical thinking to face unique and new issues daily, and to deal with challenging demands from customers. Dealt with and resolved high stress and tense situations between customers. Top Salesperson of the month.

Education

The University of British Columbia **Sept 2018 – May 2023 (expected)**
Engineering Physics, BASC
24 Credit Average: 91.1%