Christian Malherbe

4th Year Engineering Physics
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Skills

Computer	Python, C, C++, Java, Git, GitHub, MATLAB, Linux, ROS, Neural Networks
Electrical	Altium Schematic and PCB design, LT Spice, Microcontrollers, NI Multisim, VHDL for FPGAs, Oscilloscope, PSU, Function generator, E-load, DAQ modules, RF current probe and spectrum analyzer
Lab Skills	Data acquisition, Data/Error Analysis, Graphing and Data visualization
Machine Skills	Hand tools, 3D printer, Laser and Waterjet Cutter, Breadboard Prototyping, SMT soldering

Technical Work Experience

Electrical Engineering COOP
Auris Health (subsidiary of Johnson and Johnson), Santa Clara **May 2021 – Present**

- Designed, tested and debugged electronics used in and for the development of six arm surgical robot.
- Used Altium Designer to design schematics and layouts for PCBs used in product and test fixtures.
- Conducted formal internal engineering reports to bring up and assess functionality of designs involving eFuses, voltage regulators, MCUs, motor drivers, and more using industry standard lab equipment.
- Investigated issues surrounding conducted and emitted radiation using RF current clamps and 10 meters scans in an RF chamber.
- Currently working on a project to determine capacity, state of health and state of charge, and understand life time degradation of batteries used in CAN controlled UPS system for robot.

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

- Teaching assistant for PHYS 159 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

GaN High Power Induction Heater Capstone Project – UBC, Vancouver **Ongoing**

- In the process of designing a 1MHz 650V optical-fiber-driven high-side-isolated H-bridge for an induction heater using GaN devices.
- Schematics and PCB layouts created using Altium designer. Circuit to be simulated using PSim.

Virtual 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 placed 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
3rd Year Average: 85.5%