

Gurmehak Pannu

Mechatronics Engineering Student

gm.pannu41@gmail.com | 778-829-0129 | 3164 Swallow Pl, Abbotsford BC

KEY SKILLS

Mechanical: <ul style="list-style-type: none">• SOLIDWORKS / ProE• GD&T• Manual Mill & Lathe• 3D Printing and Waterjet Cutting• Metrology Equipment• PLM, ERP	Software and Electrical: <ul style="list-style-type: none">• Python, C#, C, C++, Assembly, Qt• Microcontroller Programming (MSP430, Intel 8051)• PLC Programming (WAGO, Siemens)• SPI, CAN, UART Communication• GitHub, TortoiseSVN• MATLAB• Schematic and PCB Design (EAGLE)• Soldering and Wiring• MS Office, VBA
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EDUCATION

University of British Columbia

B.A.Sc. Mechanical Engineering: Mechatronics Option

Dean's Honor List, Cumulative GPA: 86%

Expected Graduation: May 2022

WORK EXPERIENCE

Software and Controls Intern

Ballard Power Systems

January – August 2021

- Invited to re-apply and was hired based on previous summer's work.
- Established a unit testing framework for software used on fuel cell controllers. Features tested include Alarm Monitoring, Communications, and State Machine Logic.
- Wrote Python programs and scripts to automate testing and development activities. Studied API documentation for 3rd party programs and created custom scripts to interact with them. Example projects include automated code generator, CAN trace parser, and config file generator.
- Created a test setup using an automotive controller and a telematics module to virtually simulate a truck interface. Wrote code for the controller using CAN J1939 specifications.
- Integrated an HMI with a WAGO PLC and created custom web-based visualizations to monitor and control Fuel Cell Operation.
- Debugging communication issues in system using CAN tracing technologies – PCAN, CANalyzer.

Electrical and Controls Intern

Ballard Power Systems

May – August 2020

- Supported Electrical and Controls team in designing, implementing, and troubleshooting system components including Sensors, High and Low voltage boards, and Harnesses.
- Developed test setup to validate a new Mass Air Flow sensor – Programmed an ESX-3CM controller to acquire, scale, and record sensor readings along with reference measurements. Integrated devices with PWM, current, and analog voltage outputs.
- Designed and built electrical harnesses to interface with high (>500V) and low voltage equipment

- Created a data-logging setup to obtain real time voltage, current, and temperature data from a field vehicle to troubleshoot failures. Sourced and implemented components including current transducers, voltage dividers, thermocouples, and cables.
- Extensively used lab equipment such as Multimeter, Bench Supply, Breadboard, etc.

Manufacturing Engineering Intern
Dometic (formerly SeastarSolutions)

September – December 2019

- Designed and fabricated assembly fixtures for use on production floor. Created 3D models and engineering drawings using PTC Creo (ProE) software.
- Prototyped an electro-mechanical system which automatically tests tension of a drive belt. Implemented system using a PLC, pneumatic actuators and valves, analog position sensors, and a DC power supply.
- Created work instructions in MS Word to outline various manufacturing processes.
- Routinely coordinated with external suppliers and manufacturers to acquire custom and off-the-shelf components.

Continuous Improvement Intern
Dometic (formerly SeastarSolutions)

May – August 2019

- Reduced waste in production environment by optimizing thread locker/lubricant usage. Conducted numerous tests to acquire product-specific technical data and statistically analyzed this data using Minitab.
- Manually machined testing fixtures to tight tolerances using mill/lathe under mentorship and guidance of a veteran machinist.
- Utilized precise (± 0.0001 ") measurement instruments such as micrometers, dial indicators, bore gauges, and a shadowgraph to obtain precise dimensions of product features.

TECHNICAL PROJECTS

Wall Drawing Robot
MECH423 – Mechatronic Design Course

September – December 2021

- Built a wall-drawing robot which can draw various shapes on a vertical surface.
- Independently developed concept with minimal instructor supervision.
- Key tasks: Development of MCU firmware to control actuators, Development of GUI in C# to interface with robot, Mechanical design, Fabrication.
- Demo: <https://youtu.be/2GK8COWo1Lo>

Winch Sensor Circuit
UBC Sailbot – Student Design Team

January – May 2020

- Designed and prototyped a hall sensor-based circuit for boat's automated winch system.
- Purpose of sensor is to provide position feedback about mechanical pivot arms to MCU.
- Final circuit is a PCB which samples and transmits data from 3 hall-sensors using SPI.
- Key Tasks: Circuit design, Proof-of-concept development, PCB design, Fabrication.

INTERESTS

Enjoy playing basketball, painting, reading, and listening to music