

SKILLS

- **Languages:** C, C++, Python
- **Hardware:** Analog/Digital circuit design, schematic capture, multi-layered PCB layout, soldering, machining
- **MCU/Processors:** STM32F4, STM32L4, STM32WB, Atmega, ESP8266
- **Protocols/Interfaces:** SPI, I2C, UART, USB, RS232, BLE, CAN
- **Electronics Debugging:** Oscilloscope, DMM, Logical Analyzer
- **Software Tools:** Arduino, Git, Altium Designer, OpenCV, MATLAB/Simulink, Webots, and SolidWorks
- **Robotic Controls:** PID, LQR/LGQ, Kalman Filter, MCP

EXPERIENCE

Electrical Designer: Forcen Inc, Toronto, ON CA 01/2022 - Present

- Conducted in-depth research in high-speed, high-resolution ADC/DAC architectures and embedded passive technology
- Designed, bring-up, and tested various power line filters and analog sensing architectures to further reduce sensor size while significantly improving the noise performance by 67.7%
- Created drivers in C for the DAC8563 and AD5689 DACs to interface with the STM32L4 MCU

Robotics Engineering: Forcen Inc, Toronto, ON CA 05/2019 - 08/2019

- Lead designer for Forcen's 2nd generation force-sensing module for medical/defence applications
- Architected a six-layer, mixed-signal, multi-rail powered, and IPC High Density compliant DAQ, featuring 10 mN resolution, 1.4 μ V noise floor, I²C/CAN /USB communication, and an ultra-compact footprint of 15 mm x 15 mm
- Developed two-layer flexible PCB force-sensing films with integrated half-bridge strain gauges
- Assisted in the preliminary firmware development in C during the PCB bring-up

Mechatronics Engineering: Nymi Inc, Toronto, ON CA 01/2019 - 05/2019

- Researched and integrated IMU motion recognition features with an STM32L4 for the next generation Nymi Band
- Designed a two-layer programmable constant current load Arduino shield for LiPo battery discharge characterization
- Investigated and Implemented a reliable voltage-based LiPo SoC estimation algorithm to achieve 82.16% of the accuracy of a 16 bit ADC using a 3 bit voltage sensor to reduce 2% of production cost

Drone Research Assistant: University of Waterloo, Waterloo, ON CA 05/2018 - 08/2018

- Prototyped a wirelessly-controlled magnetic docking station to charge a drone when landed
- Designed two-layer PCBs for controlling electromagnets, drone onboard charging, and landing station signaling
- Implemented drone landing detection and charging process control in C using Arduino

PROJECTS

MOBIUS

- Designed a small-size two-layer PCB wearable gesture-recognizing cursor input ring with an STM32WB
- Assisted in firmware development in C for sensor interfacing, gesture recognition, and BLE communication
- **Technologies / Protocols:** STM32WB, LSM9DS IMU, RF, I2C, BLE, Capacitive Sensing, C, Altium Designer, 3D Printing, Lasercutting

Autonomous Search & Rescue Robot

- Designed and created an Atmega-2560-based autonomous self-localizing robot
- Implemented firmware in C for various I2C sensor data retrieval, motor PWM controls, and PID motion autocorrections
- **Technologies / Protocols:** Atmega 2560, VL53L0X ToF, BNO055 IMU, Ultrasonic, I2C, C, PID, Altium Designer, 3D Printing, Lasercutting

RC Micro Drone

- Designed a two-layer PCB drone with an STM32F4, an MPU9250 IMU, and brushed DC motor drivers
- Developed firmware in C for PWM radio communication, motor PWM controls, and drone PID stabilization
- **Technologies / Protocols:** STM32F4, MPU9250 IMU, SPI, UART, C, PID, Altium Designer, 3D Printing, Lasercutting

EDUCATION

M.Eng in Electrical Engineering (Artificial Intelligence Specialization, CGPA: 3.8)

University of Waterloo | Waterloo, ON CA

01/2021 - 01/2022

Relevant Courses: Optimal Controls, Statistical Signal Processing, Filtering and Control of Stochastic Linear Systems

B.A.Sc in Mechatronics Engineering

University of Waterloo | Waterloo, ON CA

09/2015 - 04/2020

Relevant Courses: Integrated Analog Circuits, Digital Controls, Advanced Dynamics, Autonomous Vehicles, Image Processing