

Rylin Soto

University of Waterloo 3B Biomedical Engineering Student

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Technical Proficiencies

Communication: GSuite, Microsoft Office, Jira, Miro, Slack, Technical Report Writing, Presentations

Regulatory: ISO 13485, 510(k), Equipment Validation, GMP & GDP, FMEA, PHA, RCA, Change Control

Software: C/C++, Python, MATLAB, Zephyr RTOS, nRF Connect SDK, Git, BLE, Wi-Fi, SPI, UART, CAN

Work Experience

Quality Assurance Engineering Intern | [Covalon Technologies](#) May 2024 - August 2024

- Conducted data analysis and created validation reports for 510(k) submission of antimicrobial collagen-infused dressings.
- Led company-wide redesign of the product UDI in response to over 4,000 individual deviations. Managed change control to update product specifications, reprogram UDI printing machines, validate designs, and revise SOPs to ensure continued compliance with FDA UDI requirements.
- Trained over 50 production staff members the basics of ISO 13485, QMS, GMP/GDP, Root Cause Analysis and change control procedures to support CAPA improvement efforts.

Product Development Intern | [Inertia PD](#) September 2023 - December 2023

- Led the verification and assembly of 17 full fidelity gut biome DNA extraction and storage devices; troubleshoot and resolved electro-mechanical issues, and liaised with clients. Achieved on-time delivery with 100% functionality.
- Employed project management tools within Jira and Miro to oversee and coordinate daily task distribution for two temporary workers. Provided technical training and mentorship, enabling them to achieve independent proficiency.
- Liaised with manufacturing plants in China to create quality checks for custom sheet metal, machined, and injection molded parts.

Biomedical Engineering Intern | [Myant Inc.](#) January 2023 - April 2023

- Used root cause analysis and signal analysis techniques to investigate and resolve anomalies in smart pressure-sensing insoles by analyzing material and electrical properties during controlled scenarios against user data, leading to a comprehensive 60-page report.
- Enhanced nRF5340 firmware for smart insoles, doubling BLE throughput by optimizing data buffer usage during the transmission of raw and differential data, resulting in a 20% increase in ADC sampling rate.

Research and Development Intern | [VN Instruments Ltd.](#) May 2022 - August 2022

- Designed and characterized saltation and anemometer sensors for Mars Rovers commissioned by NASA.
 - Conducted rapid prototyping to develop a 4 layer PCB for speed detection of 125um sized particles using KiCAD, photodiodes, and VGA. Simultaneously modified Python and C firmware for STM32 interfacing.
 - Developed and performed test protocols for particle detection to characterize and debug noise variables. Built test bed and applied signal analysis techniques, achieving accurate speed calculation for 80% of particles.
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Projects

Talk on The Under-representation of Women in the Medical Device Industry Personal Project

- In pursuit of one of my passions: making the medical device industry safer for women; I developed a 30 minute informational presentation highlighting failed devices, main contributors and areas of improvement.
- Presented to a group of 25 during a previous internship, with plans for additional talks in the future.

Froggy: IoT Pool Thermometer Personal Project

- Designed a 4 layer PCB to interface NTC thermistor with onboard ESP32 to transmit pool temperature over wifi, equipped with USB and solar cell Li-Po charging.
- Currently writing ESP32 firmware and developing a web dashboard for current and past pool temperature recordings.

Myoelectric Prosthetic for Handwriting Lab Project

- Designed and built a medium-fidelity hand prosthetic using Arduino UNO to process EMG signals from the forearm, enabling the end-effector to pick up a pencil for handwriting.
 - Designed comfortable, compact, 3D printed housing for ambidextrous users using SolidWorks.
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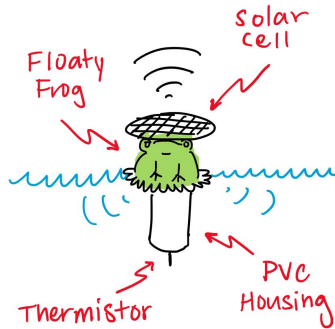
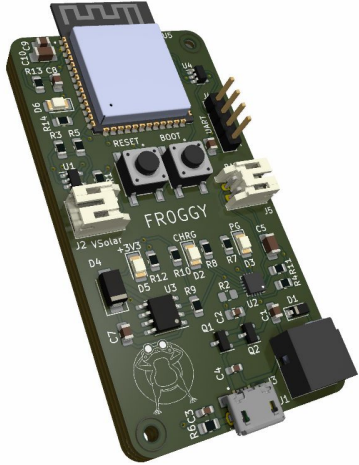
Education

BASc in Biomedical Engineering, University of Waterloo | 3.74 cGPA Graduation April 2026

Interests Crochet, Bullet Journaling, Vintage Plates, Cats and Dogs, Hiking/Running, Thrifting

Froggy: IoT Pool Thermometer – Personal Project

ESP32; KiCAD; UART; Wi-Fi; Solar Cell & USB LiPo Charging; NTC Thermistor; C++



Objective: Develop an IoT floaty pool thermometer to transmit pool temperature over Wifi.

Result: Designed a 4 layer PCB using KiCAD featuring an on board ESP32, NTC thermistor, USB Micro & Solar Cell LiPo charging with dynamic power path management, programmable via UART interface. Encased in watertight PVC enclosure with 3D printed PCB holder insert.

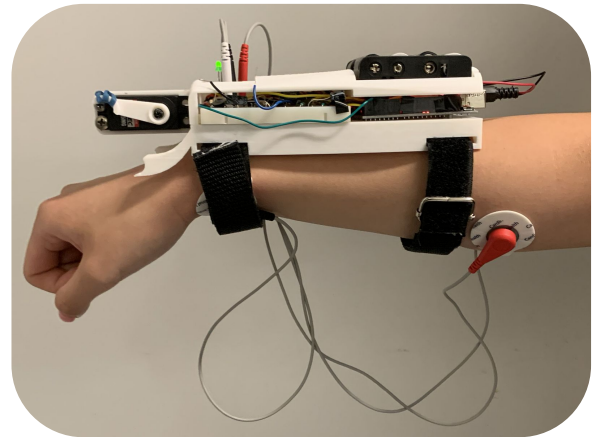
Currently Working On: ESP32 firmware for Wi-Fi transmission. Web dashboard for current and past pool temperature recordings.

Myoelectric Prosthetic for Handwriting – Lab Project

Arduino; SolidWorks; Biosignals; Oscilloscope; Function Generator; Servo motor; Rapid Prototyping; Signal processing

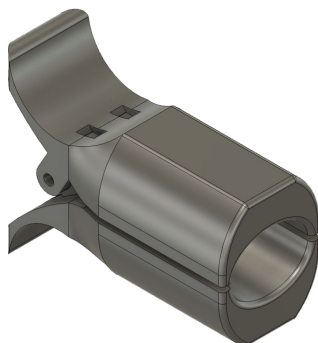
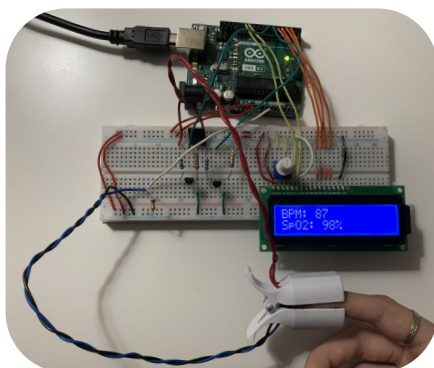
Objective: Develop a wearable prosthetic aimed at assisting hand amputees in writing as controlled by EMG signals.

Result: Designed and built a medium fidelity hand prosthetic which processes forearm EMG action potentials enabling the end-effector to pick up a pencil for handwriting. Employed signal processing techniques including filtering, amplification, rectification and integration. Created a comfortable, compact, 3D-printed housing for ambidextrous users using SolidWorks and conducted an FEA analysis to ensure functionality prior to fabrication.



Pulse Oximeter from Scratch – Personal Project

Arduino; Fusion 360; KiCAD; C++; Biosignals; BJTs; Photodiode; LCD; Soldering

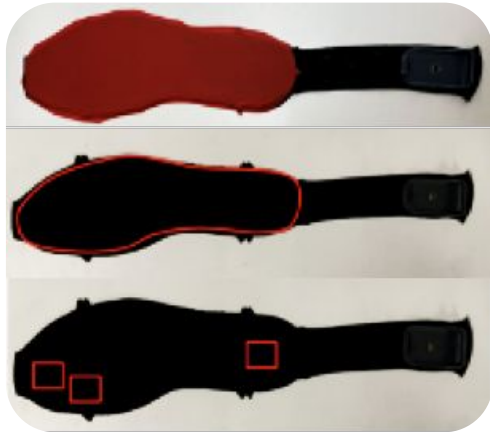


Objective: Design an at home Pulse Oximeter to calculate Blood Oxygen Saturation and Heart Rate.

Result: Designed a circuit to rapidly alternate Red and IR LEDs, capturing light absorbance through the finger via a photodiode. Wrote C++ algorithm to calculate Blood Oxygen Saturation and Heart Rate measurements which were validated by an external device. 3D printed a custom enclosure to house the LEDs and photodiode, minimizing ambient light absorbency for enhanced accuracy.

Smart Insole Moisture Validation – Internship Project

Capacitive Pressure Sensing; Instron Machine; BLE; Python; Material Science; Technical Report Writing



Objective: Investigate the cause of irregular behaviour in smart pressure-sensing insoles over prolonged usages.

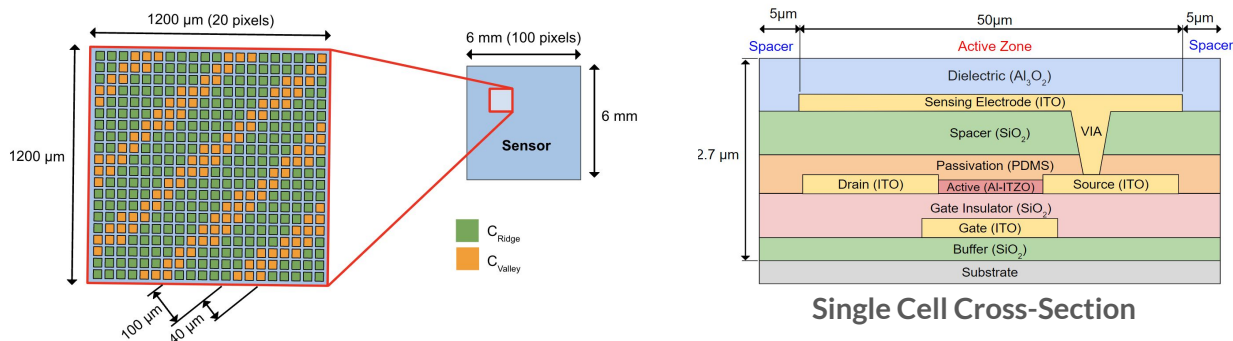
Result: Using root cause analysis and signal analysis techniques on results from controlled and user-generated data; I identified irregular pressure readings in the smart capacitive pressure-sensing insole, stemming from channel shorting due to moisture accumulation within users' shoes. I prototyped 3 lamination techniques to mitigate sweat absorbance, evaluating each under both ideal and user loading conditions. The findings were compiled into a comprehensive 60-page report, detailing the issue, results from enhanced lamination techniques, and recommendations for the final product.

Self-Capacitive Transparent Fingerprint Sensor – Lab Project

Nano Materials, TFT, Capacitive Pressure Sensing, Human Skin Properties; Literature Review

Objective: Design tactile, transparent sensor that detects variations in surface geometry as small as 100µm to enable fingerprint detection for authentication in a consumer device.

Result: Designed weatherproof, biocompatible, self-capacitive, transparent, 504 PPI fingerprint sensor with a 100 x 100 sensor pixel array. Simulations of sensor showed noise suppression aligning with or surpassing currently available sensor options.



The Under-Representation of Women in the Medical Device Industry – Personal Project

Presenting; Research; FDA; Health Canada; DEI

Objective: Craft an informational presentation to raise awareness about to the lack of female representation in the medical device industry.

Result: Developed a 30-minute presentation highlighting: recently discontinued dangerous devices, main factors contributing to gender under-representation, counter arguments, and proposed areas of improvement that can be made on societal and industry levels. I had the opportunity to present to a group of 25 during a previous internship, with plans for additional talks in the future.