

SAMSON HUA

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EDUCATION

University of Calgary – Dual Major | GPA 3.80 | Schulich Community Service Scholar | Expected Graduation: May 2024
Dual Major in Mechanical Engineering & Operations Management

WORK EXPERIENCE

Product Management Intern | [Ambi Robotics](#) - Berkeley, California May 2023 – Sep 2023

- Collaborated cross-functionally between teams to assess feature requests, align strategic priorities, develop customer-facing presentations, and to formulate actionable product requirements through tools such as **Asana** and **GitHub**.
- Utilized **Grafana** and **Python** to create and deploy 5+ internal dashboards with custom modules written in **JS** and **AppScript**, enabling effective visualization and analysis of complex data metrics to make informed product decisions.
- Developed a company-wide dashboard that interfaced with **internal Cloud API**, using a **Raspberry Pi** to automatically launch, cycle through, and update company-wide metrics and KPIs to be shown on a widescreen projector.
- Product validation and performance reporting of new major software version, assisting in **A/B testing**, **regression testing**, and active metrics monitoring during development, leading to deployment improved performance by **30%**.

Robotics Test Engineering Intern | [Attabotics](#) - Calgary, Canada May 2021 – Sep 2022

- Evaluated product reliability and system validation of robotic warehousing system through various tasks, testing embedded firmware, evaluating system-level **.NET software**, and validating **SQL**-based inventory management.
- Designed various internal test automation tools, utilizing **Fusion 360**, **EasyEDA**, **C++**, and **Python** to create test fixtures for automated robot testing, 3D printed enclosures for PCBs, and optimization of manufacturing jigs through CI.
- Performed failure **root cause analysis (RCA)** for mechatronics systems, developing comprehensive **test suites**, performing **A/B testing**, **regression testing**, and creating detailed test reports and bug documentation in **Azure DevOps**.
- Conducted system-level validation for various components on the robot, including validation of **Elmo Motion Controllers** for robot drive system, verification of module and sensor functionality for **STM32-based hardware**, and verification of Telemetry and logging functionality through internal **Cloud API**.

EXTRACURRICULAR & VOLUNTEERING INVOLVEMENT

President & Technical Team Founder | [Alberta Collegiate Robotics](#) Jul 2019 – May 2022

- Formed and led a technical team of over **80+ students**, creating a foundation for the first robotics-focused technical team at the University of Calgary, developing **over 7+ partnerships**, and **raising ~\$10,000** in sponsorship and assisted with development of several technical team projects.
- Coordinated with various non-for-profit STEM organizations and team members to spearhead and run 2 mentorship programs, **+5 workshops**, and **+3 outreach** events in the Calgary community over the span of a year.
- Worked on various technical projects such as a custom **ESP32-based** robot drive platform that had design features supporting four 2A motors with closed-loop control, **CANBUS** functionality, and voltage monitoring.

FIRST Robotics Competition Mentor | [Schulich Community Robotics Program](#) Oct 2018 – Sep 2021

- Mentored a local community all-girls FRC robotics team (4604) of 12 high school students in fundamental concepts in robotics and mechatronics principles including items such as CAD, fabrication, and soldering.
- Volunteered a total +200 hours and encouraged female participation in technical vocations to develop STEM interest in youth by teaching relevant, useful, and industry applicable STEM skills.

SUMMARY OF SKILLS

Mechanical: Solidworks, Fusion 360, GD&T, 3D Printing, Rapid Prototyping, Manufacturing Processes, Control Systems

Software: C, C++, Python, MATLAB, Linux, ROS2, Arduino IDE, PlatformIO, Git/GitHub, DevOps

Electrical: KiCAD, Altium, SMD Soldering, Test Equipment (Oscilloscope, DMM, Function Generator, Electronic Loads)

Embedded: Schematic & PCB Design with STM32, ESP32, PIC, and Raspberry Pi platforms

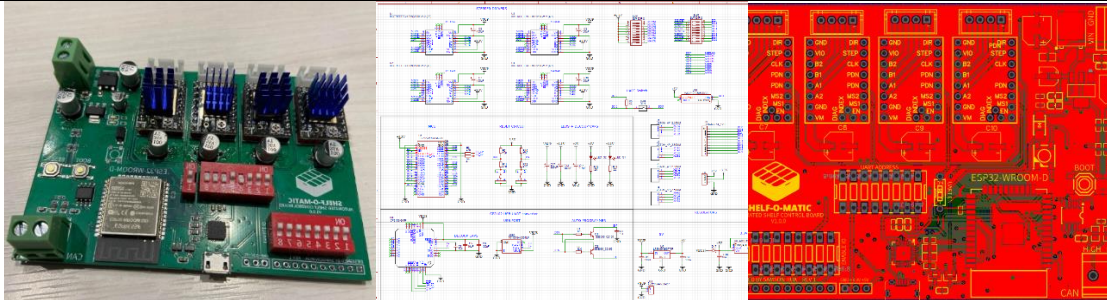
ADDITIONAL PERSONAL PROJECTS & TECHNICAL AWARDS

See all my personal projects details and technical competitions at <https://www.samsonhua.com>

TECHNICAL PORTFOLIO

Custom TMC2209 Stepper Driver Board for Test Automation Jig

March 2022 – May 2022

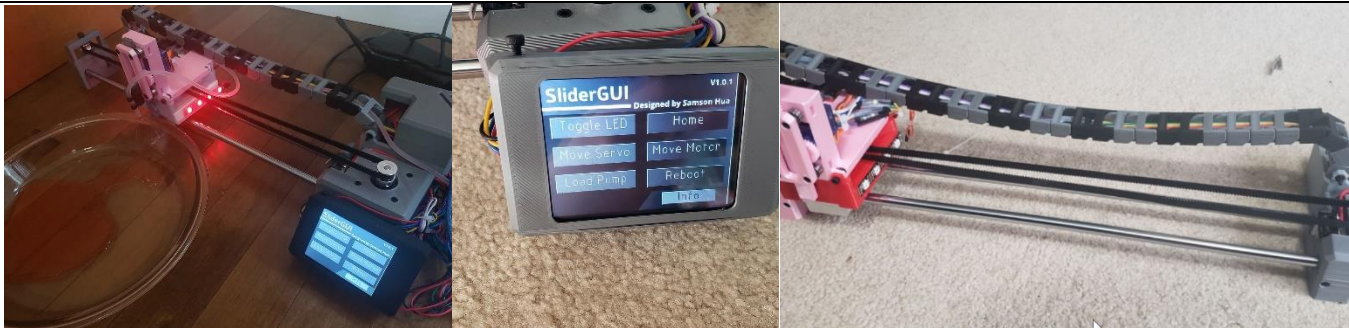


For a learning project, my supervisor challenged me to develop a test automation jig which incorporated stepper motors to adjust the height of a structure component to be able to automatically sweep through a variety of tests.

- Developed and designed electrical schematic for a 4-stepper motor driver with **CANBUS**, **wireless**, and **USB functionality**.
- Incorporated various components such as the **ESPRESSIF ESP32**, **TMC2209 Stepper Driver**, **CP2102 USB-UART** converter, **TJA1050 CAN** Transceiver, and various **LDO** voltage regulators varying from 12V to 5V, and 5V to 3.3V.
- Used **turnkey PCB assembly** and programmed basic functionality with **PlatformIO** for proof-of-concept demo to adjust stepper motor current, parameters, and stall-detection through **UART** connection.
- Project in action: <https://www.youtube.com/watch?v=IHE--8iTMFc>

Automated Robotic Portioning Device

May 2020 – July 2020

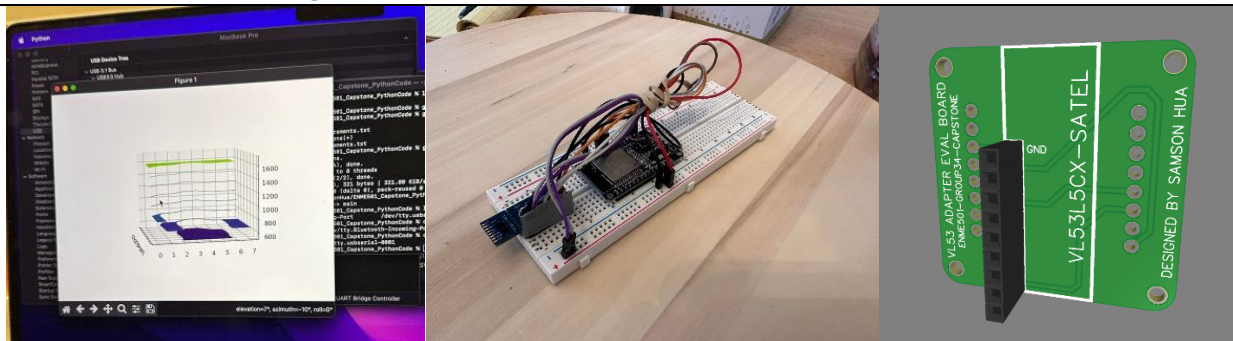


A friend had reached out to me to develop a proof-of-concept prototype for his additive manufacturing lab where he was attempting to automate the controlled dispensing of liquid into a line of test tubes. Being one of my first projects, it was an interesting learning experience.

- Designed and assembled mechanical assembly in **SOLIDWORKS**, with sub-assemblies including stepper motor gantry, peristaltic pump, and electronics and touchscreen housing.
- Wired stepper motor, drivers, and microcontrollers together through protoboard and wrote proof-of-concept code in **C++** through **PlatformIO** to incorporate features such as gantry homing, **touch interface/HMI**, and **LED** status indicators.
- Project in action: <https://www.youtube.com/watch?v=LnchsknUcM0>

LiDAR/ToF-Based Bin Positioning/Localization

September 2022– April 2023



For my engineering capstone, we worked with a local robotics company to develop an improved robotic bin picking mechanism. As the instrumentation lead of the team, I developed a proof of concept for bin detection through the evaluation of an 8x8 ToF sensor.

- Researched and selected the **VL53L5CX 8x8 ToF** sensor for feasibility in detecting bin location and pose.
- Developed proof of concept setup and breakout PCB for the **VL53L5CX** evaluation board to further evaluate sensor.
- Wrote basic **C++** implementation code to collect sensor data through **I2C**, and stream serial data to be processed in **Python**.
- Integrated onto prototype assembly for final capstone project deliverable.