University of Waterloo

Co-operative Work Terms

Joseph Jabile
21142640
1B Systems Design Engineering, Honours, Co-operative Program

Work Term	Employer	Evaluation
Jan - Apr 2025	Student Design Teams - University of Waterloo UW Reality Labs Waterloo Ontario Canada Mechanical Designer	EXCELLENT

Planned Future Work Term(s)

Sep - Dec 2025
May - Aug 2026
Jan - Apr 2027
Sep - Dec 2027
May - Aug 2028

Joseph Jabile

jmpjabile@uwaterloo.ca
github.com/jjabile

Joseph Jabile
3314 Cajun Crescent
Mississauga, ON L5L 5T8

Dear Hiring Manager,

I am writing to express my keen interest in the Intern position with your company. After researching the team, I realised your company's dedication to innovation aligns with my own love of creating! I'm available for both 4 and 8 month terms and would love to join.

As an Intern, I hope to contribute my resourcefulness and hardware tuning abilities.

Hardware Tuning: At UW Reality Labs, while developing a humanoid robotic arm, I was responsible for integrating force and position sensors to enable responsive joint control. I faced challenges with noisy readings from the force sensors during motion, which disrupted closed-loop control. After isolating the issue, I redesigned the sensor mounts to reduce mechanical vibration and added filtering in the microcontroller code to stabilize signals. This improved force sensing accuracy by over 40% during dynamic testing and enabled smoother joint actuation across a full range of motion.

Resourcefulness in Action: During my time as a production planner at Cyclone Mfg., I was surprised by the amount of waste created by the machinery in the manufacturing process relative to the size of the part being created. Understanding the environmental impacts this has, I took the initiative to create data sheets to display the material requirements for common parts and compared them to the size of materials available. In collaboration with the sourcing department for measurement and using both AX and excel, I helped minimize waste and increase the efficiency of materials by 5%.

I would be thrilled to bring these attributes as an intern. Thank you for your time and consideration.

Sincerely,

Joseph Jabile

Joseph Jabile

jmpjabil@uwaterloo.ca
github.com/jjabile

Skills

CAD: SolidWorks, Fusion360, Altium
Programming/Data: Arduino, ESP32, C, C++, SPI, I2C, CAN, ROS2, MATLAB, Dynamics AX, Excel, Python, Docker
Manufacturing Tools: Machining (Mill), Soldering, 3D Printing (FDM), Sensors, BOM, GD&T, Prototyping
Design Principles: DFM, DFA, FEA (SolidWorks, Ansys), Technical Drawing, Design Thinking, User Research

Experience

Humanoid Mechanical Lead – WATOnomous/Waterloo Reality Labs – University Of Waterloo Feb 2025 - Present
- Designed functional finger and hand components, mimicking human biomechanics in **SolidWorks** with DFM and GD&T
- Engineered a modular torque test jig using **Fusion360** to compare 3 interchangeable finger designs (tendon and direct actuation), motors (gimbal, servo), and gearboxes (cycloidal and harmonic) optimizing for torque output and control.
- Led team of 5 in research and implementation of **IMUs, Magnetic Encoders, Piezoelectric Sensors, and Touch Sensors** creating mounts, and wire routing on humanoid finger, wrist, and arm permitting 80% accurately controlled movement
- Created Bill of Materials for budget estimation and ensured that all materials were provided by trustworthy vendors

Embedded Software and Electrical Designer– WATOnomous – University Of Waterloo March 2025 - Present
- Integrated a static obstacle avoidance algorithm using ROS2 with **RCLCPP, RCLPY and Docker** into a virtual differential drive vehicle with LiDAR simulator using **FoxGlove** accurately going from point to point using the optimal path
- Designed breakout boards in **Altium** for VCNL4040 (proximity sensor), and LPS25HB (piezoelectric)
- Scripted in C++ for sensor integration and testing over **CAN** bus and **I2C** bus using ESP-32 board

Mechanical Designer – UW Formula Electric – University Of Waterloo Sept 2024 - Dec 2024
- Collaborated with tractive sub-team to design effective thermal management solutions for a high-voltage lithium battery and conducted **FEA using Ansys** to simulate and optimize heat dissipation by 30%

Production Planner – Cyclone Manufacturing – Mississauga, Ontario Sept 2022 - Jan 2023
- Implemented part tracker spreadsheet and mandatory checks, reducing production planner turn around time by 20%
- Identified 30+ past due parts and linked excess raw material to meet demand for SAAB Aerospace (Boeing 787), Boeing/SAAB (T7A Fighter), Spirit Airlines, Airbus and resolving 40+ customer complaints using ERP and Excel resulting in a 10% decrease in material shortages, shipping delays and missing parts issues

Projects

Auto Medicine Dispenser | *Fusion360, CircuitIO, C,* Feb 2025
- Designed a 3D printed automatic rabbit dispenser using **Fusion360** incorporating **Arduino, DC motors, LCD and a RTC module** using mounting mechanisms on rabbit gates to dispense scheduled medicine
- Programmed timing logic in **C** to automate feeding intervals and ensured reliable and consistent medicine dispensation

Autonomous Drone | *OpenCV, SolidWorks, Arduino, C++, Altium, 3D printing, ELRS* March 2025
- Engineered and assembled a sub-250g autonomous drone integrating a modular **SpeedyBee F405 Mini flight controller stack (ArduPilot)**, **ESC**, and **GPS** resulting in a control precise and system responsive autonomous drone
- Optimized a lightweight carbon fiber frame using hollow-structure design principles, reducing total system weight and lowering power consumption by improving thrust-to-weight efficiency.
- Created breakout boards for **ESC** using **L6234 motor driver IC, Arduino Nano,** and **LM393 Comparator**

Education

University of Waterloo - Systems Design Engineering, Bachelor of Applied Science 2024 - Present)

UNIVERSITY OF WATERLOO
UNOFFICIAL GRADE REPORT

Joseph Jabile
21142640

1B Systems Design Engineering, Honours, Co-operative Program

Fall 2025

PD	20	Strategies for Career Success	
Term Average:	N/A	Decision:	

Spring 2025

SYDE	162	Human Factors in Design	
SYDE	112	Calculus 2	
SYDE	114	Matrices & Linear Systems	
SYDE	102	Seminar	
SYDE	192L	Digital Systems Lab	
SYDE	192	Digital Systems	
GENE	120	First-Year Eng Seminar	
SYDE	223	Data Structures & Algorithms	
CLAS	104	Classical Mythology	
Term Average:	N/A	Decision:	

Winter 2025

PD	19	Tactics for Workplace Success	CR
COOP	1	Co-operative Work Term	CR
Term Average:	N/A	Decision:	

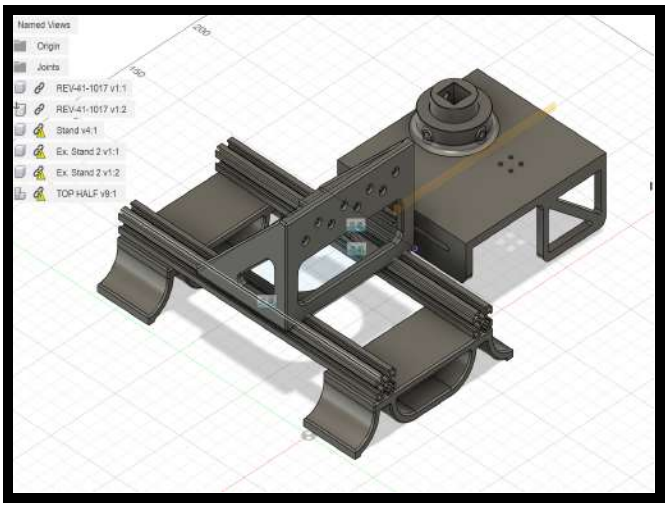
Fall 2024

SYDE	161	Intro Design	75
SYDE	111	Calculus 1	76
SYDE	113	Elementary Engineering Math	76
GENE	119	First-Year Engineering Seminar	
SYDE	121	Digital Computation	82
SYDE	101L	Communications: Visualization	77
SYDE	181	Physics 1: Statics	82
SYDE	101	Communications: Written & Oral	83
Term Average:	78.73	Decision: Good Standing	

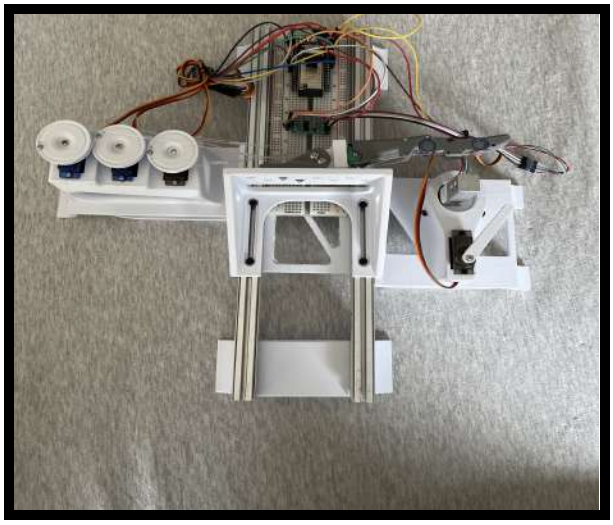
Portfolio

jmpjabil@uwateloo.ca
github.com/jjabile

Torque Test Stand *UW Reality Labs*



SolidWorks Prototype



Final Design

- Created a detailed SolidWorks assembly and used Version control on Fusion360 to test torque force of **multiple finger prototypes, two motor types, and gearboxes with varying ratios (5:1, 10:1, 20:1)**
- Designed Gearboxes, and optimized GD&T for load cell and finger placements.
- Programmed Torque stand using **ESP32** with Arduino IDE in C
- **Performed structural and motion analysis using FEA in SolidWorks**, ensuring the frame could withstand strong motor outputs of up to 20 lbs force

Component Breakdown

Gearbox

Finger Prototype

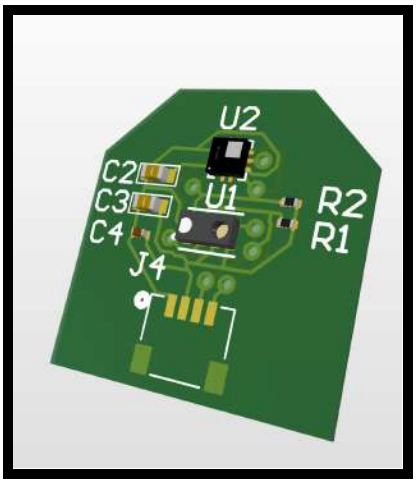
Magnetic Encoder Mount

- Custom Designed gearbox to reduce load on motors and aid in proper finger actuation on the device
- Magnetic Encoder implementation to track gimbal motor positioning
- Finger prototype design using tendon actuation and pin joints allowing for 2 DOF

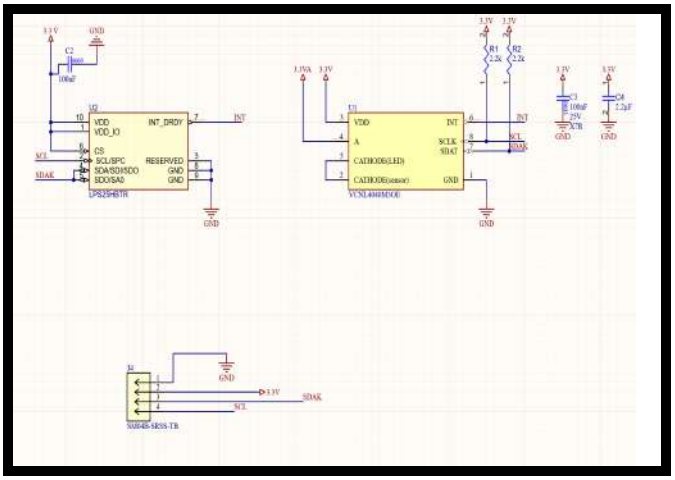
Portfolio

jmpjabil@uwateloo.ca
github.com/jjabile

VCNL4040 + LPS25HB Breakout Board *UW Reality Labs*



3D Model

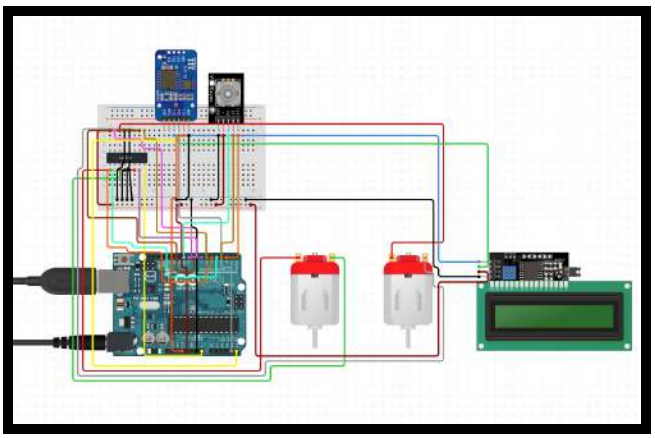


Schematic

- Created a light + pressure sensor for finger tips of humanoid robot using **Altium**
- Optimized routing and component placement for compactness to optimize for
- Tested and cleaned up sensor data in **C** and translated **I2C** to **CAN** bus using **ESP32**
- Applied engineering principles and user feedback to iteratively adjust the design for enhanced functionality.

Rabbit Medicine Dispenser

Fusion360 Prototype



Circuit drawing

- **Built a time-triggered automation system** using Arduino Uno, a DS3231 RTC module, and dual DC motors to **dispense medicine at 7:00 AM, 3:00 PM, and 11:00 PM** reliably every day in C
- Designed and wired an integrated circuit using RTC, I2C LCD and Motor drivers.
- **Implemented user feedback** via an LCD screen displaying current time and status ("Ready", "Dispensing...", "Done").

Joseph Jabile

21142640

1B Systems Design Engineering, Honours, Co-operative Program

This job is funded by the Government of Canada as advertised in the job posting. To be eligible you must be a Canadian citizen, permanent resident or a protected person defined by the Immigration and Refugee Protection Act. Do you meet this requirement?	Yes
Are you open to an 8 months co-op?	Yes