Brandon Jahoor

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Dear Recruiter,

I am writing to express my interest in a *Winter 2026* position at your company. I am a **Mechatronics Engineering** student at the **University of Waterloo,** with hands-on experience in robotics engineering.

At UW Robotics, I developed a **RealSense camera** system with **OpenCV** in **ROS2** and modeled **drivetrain kinematics** for a Mars-style rover. At BHF Robotics, I contributed to their **autonomous electric weeder** by training an AI deep learning model, implementing **ROS2-based navigation**, and troubleshooting critical **electrical systems**.

Amongst my personal projects is a **3-DOF robotic arm** on a **Raspberry Pi** using **ROS2**. Capable of sorting coloured tokens via **OpenCV**, it was **designed**, **prototyped**, & **3D printed** entirely from scratch. This academic term, I am also developing a **custom OS** in C on an **STM32 microcontroller**.

I am currently an **Undergraduate Research Assistant** at the **University of Waterloo RoboHub.** As I am currently selecting a project, I can't speak too much on the experience.

Previously, I helped launch a Bluetooth lighting controls app at RAB Design and led QA for a **prototype** at ODG, earning **top performance ratings** at both. I've supported past engineering efforts at Jule/eCAMION and mentored a FIRST Robotics team to international competition.

With growing expertise in **VHDL**, **PLCs**, and **robotics systems**, as well as a numerous of personal projects, I am eager to bring my technical skills to a hands-on engineering team. Thank you for considering my application, I look forward to discussing how I can contribute to your team.

Sincerely,

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Candidate for BASc in Mechatronics Engineering Honours, Minor in Computer Engineering, University of Waterloo

Skills

- **Programming:** C++, Python, ROS2, Object-Oriented Programming, MATLAB, Docker, Data Structures & Algorithms, C, RobotC
- **Digital Logic:** PLC ladder logic, FPGA programming using VHDL
- **Prototyping:** CAD(SolidWorks), 3D printing, raspberry pi, stm32, electrical, hand & power tools

Experiences

Robotics Research Assistant *– University of Waterloo RoboHub* *(September 2025-December 2025)*

Robotics Engineering *– University of Waterloo Robotics Team (Co-op)* *(June 2025-August 2025)*

- **Company Overview:** Develop a custom remotely operable robotic system comparable to the MARS rovers designed by NASA.
- Developed **control and autonomy** software in Linux using **ROS2** framework (docker).
- **ROS2 Realsense** camera streaming project with compression, **OpenCV** viewer, and resolution select nodes
- 6-wheel drivetrain modelling project with solved **forward & inverse kinematics**
- Implement **electro-mechanical solutions** for **system integration** by sourcing/**designing components**.

Robotics Engineering *– BHF Robotics (Co-op)* *(May 2025-June 2025)*

- **Company Overview:** Produce autonomous Electric Weeders using AI deep learning vision for farming applications.
- **Prototyped parts**, created technical drawings, ran simulations for manufacturing.
- Programmed **autodrive algorithm** for **autonomous robot navigation** using **python/ROS2**.
- Diagnosed and **resolved electrical issues**, restoring manual controls and e-stop functionality.
- Trained **deep learning AI** model for weed/crop detection.

Mechatronics Engineering *– RAB Design Lighting (Co-op)* *(September 2024-December 2024)*

- **Company Overview:** End-to-end LED Lighting solutions provider with in-house customization and pre/post sales support.
- Validated and tested **lighting controls app**; created app manual and training materials ensuring **successful app launch**.
- **Designed process improvement** tools (flowcharts, templates) to streamline product launches.
- Created Engineering documents and conducted electrical & mechanical **validation/testing**.
- Regularly used **SolidWorks & AutoCAD** for design, development, documentation.

Quality Assurance Engineering *– Ontario Drive & Gear (Co-op)* *(January 2024-April 2024)*

- **Company Overview:** Custom in-house manufacturer of AMGA/ISO compliant gears.
- Lead Quality Department on **prototype new product launch** under extraordinary deadlines earning AGMA Foundation **Scholarship**
- Interpreted **GD&T** to perform high-prevision inspections in **quality-lab**, and managed/completed **Engineering deliverables**.

Electrical Engineering *– Jule/eCAMION (Co-op)* *(February 2022-June 2022)*

- **Company Overview:** Jule EV charging/energy storage and pipe inspection.
- Gained experience across electrical, design, software, & quality **engineering functions** and **assembled & wired** EV chargers.

Youth Robotics Mentor *– FIRST Robotics - First Lego League (FLL)* *(January 2021-December 2023)*

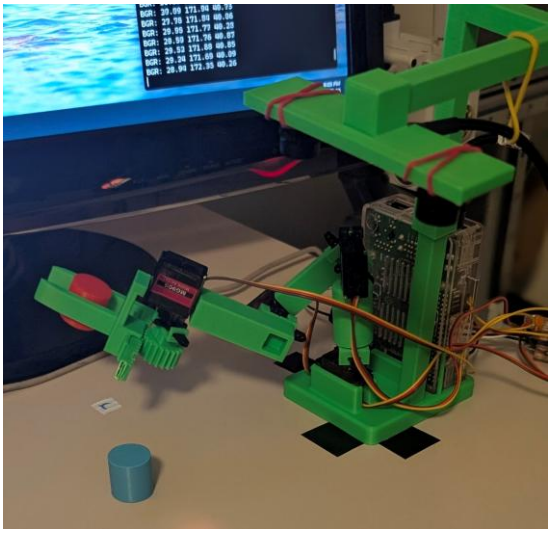
- Awarded **Coach/Mentor Award**, coached team to national qualification, attended Arkansas Razorback **International**.

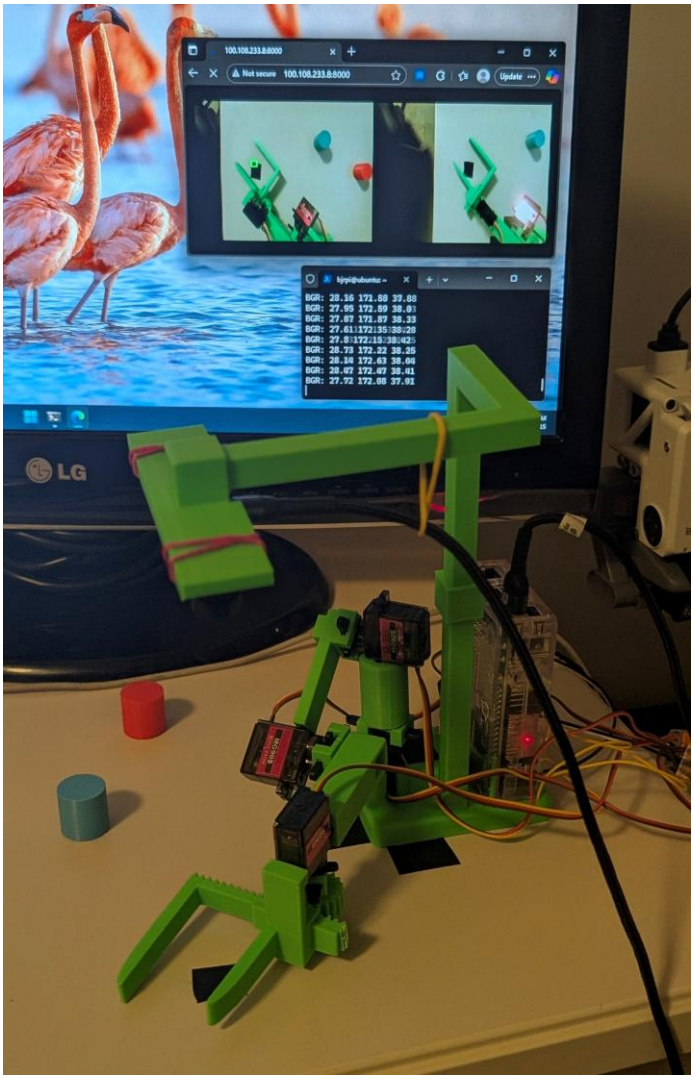
Projects

- **Robot Arm:** Designed (CAD), prototyped and 3D-printed coloured token sorting robot using OpenCV with ROS2 on Raspberry Pi.
- **C Operating System:** Currently developing custom operating system in C using STM32 Nucleo 64 Microcontroller.
- **PLC Programming:** Programmed Siemens PLC using ladder logic to control motors, sensors, & buttons.
- **Rubik's Cube Solver:** Built Lego EV3 robot using RobotC; integrated Python solving algorithm.
- **Retro Arcade Console:** Assembled Raspberry Pi powered arcade retrofit machine.
- **Motorized Bicycle:** Engineered motorized (gas) bicycle retrofit using metal cutting, welding, and drilling skills.
- **Smart Lighting Fixture:** Customized advanced LED fixture, incorporating app lighting controls from RAB Design.

Robotic Arm

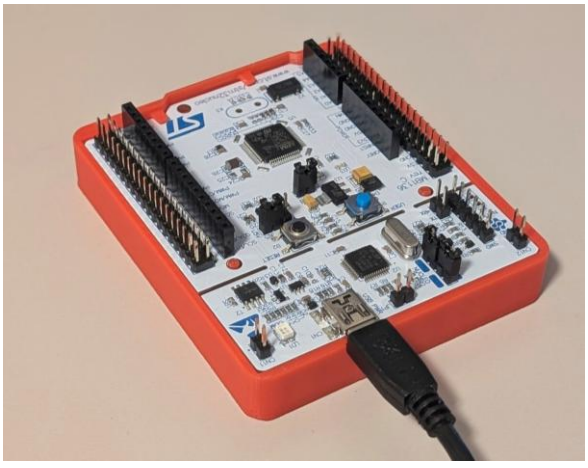
This robotics project was designed from scratch in SolidWorks and 3D-printed. Motors were controlled via PWM, internal communication ran on ROS2 on a Raspberry Pi (Ubuntu), and OpenCV processed an overhead camera for token colour detection.





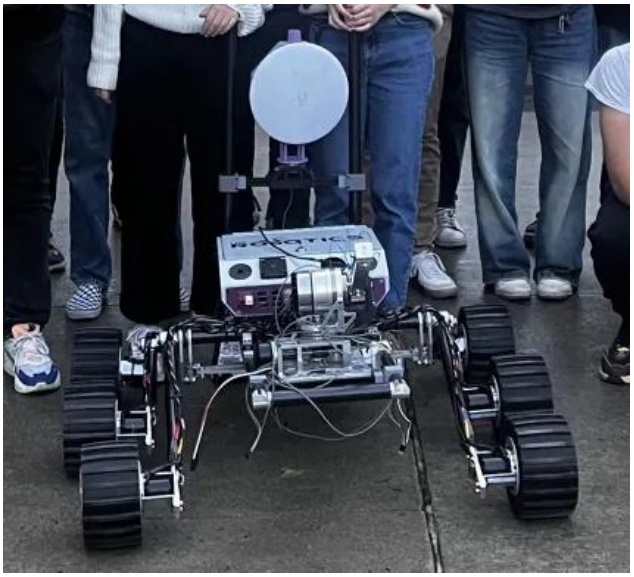
STM32 Custom OS

During this academic term I am developing a custom operating system on this STM32 Nucleo microcontroller board in C



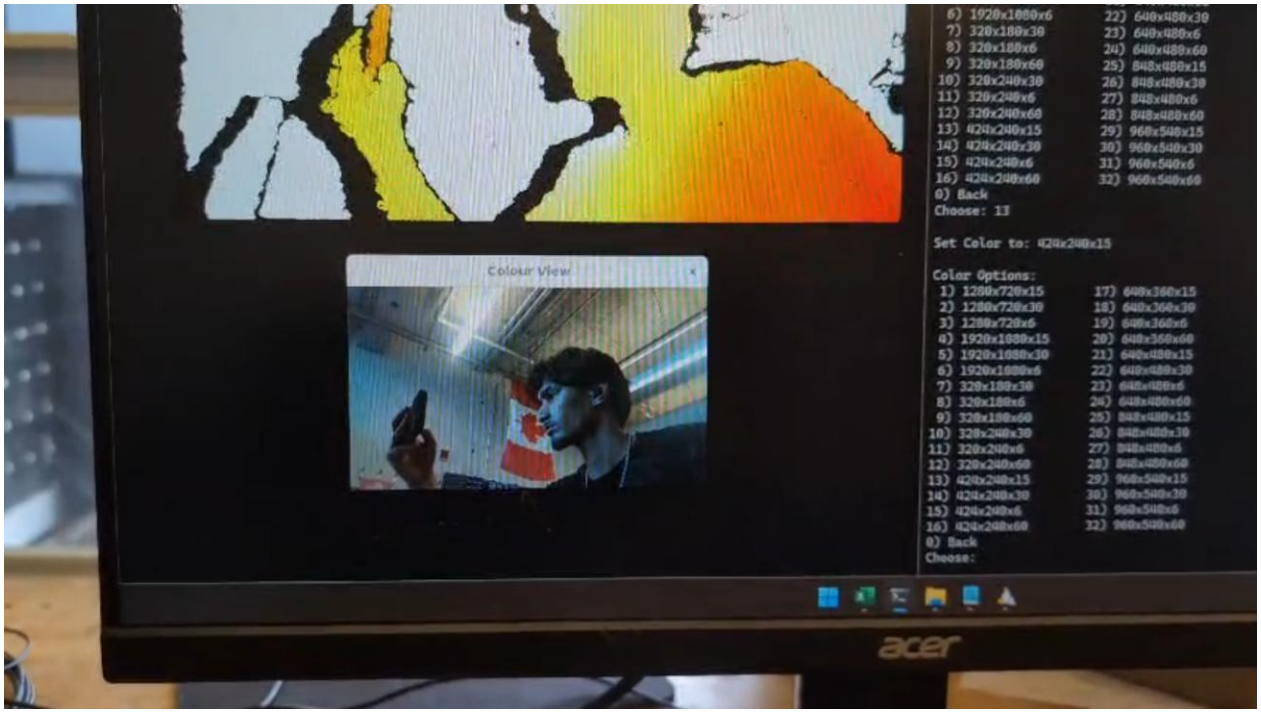
UW Robotics Mars-Style Rover

UW robotics creates a Mars-Style rover to compete in the annual CIRC challenge.



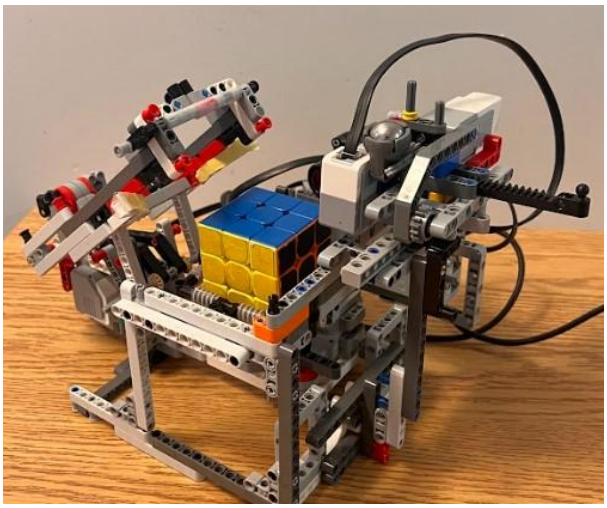
RealSense ROS2 Camera

In this project I streamed colour and depth data through a ROS2 pipeline using a RealSense wrapper, implemented custom compression to significantly reduce wireless bandwidth, and created node for rolling resolution selection.



Rubik's Cube Solver

My team built a Lego EV3 project, programmed with Robot C, and integrated a Python solving algorithm. Our work followed a formal design process and was thoroughly documented in a report.



Awarded Arthur F. Church Mechanical Engineering Scholarship ($10000) by the University of Waterloo

Raspberry Pi Arcade

This fully functional, retro-inspired arcade console features a wide selection of games.

Motorized Bicycle

I transformed my bicycle into a motorized machine using a 2-stroke engine retrofit kit. This project required a range of skills, including metal cutting, welding, and drilling.

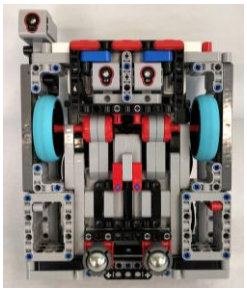
AGMA Foundation Scholarship

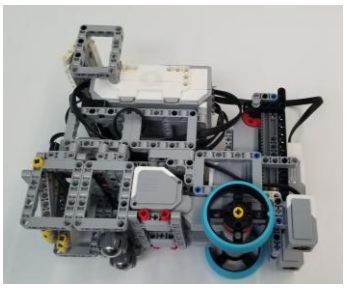
Awarded $5000 for outstanding Co-op contributions at Ontario Drive and Gear.

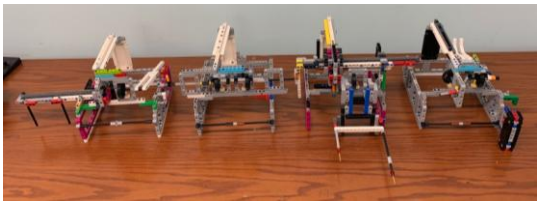
Custom Lighting Fixture

As a parting gift, I had the pleasure of customizing a lighting fixture for myself, incorporating the advanced app lighting controls I worked with during my co-op term at RAB Design.

First Robotics Arkansas Razorback International



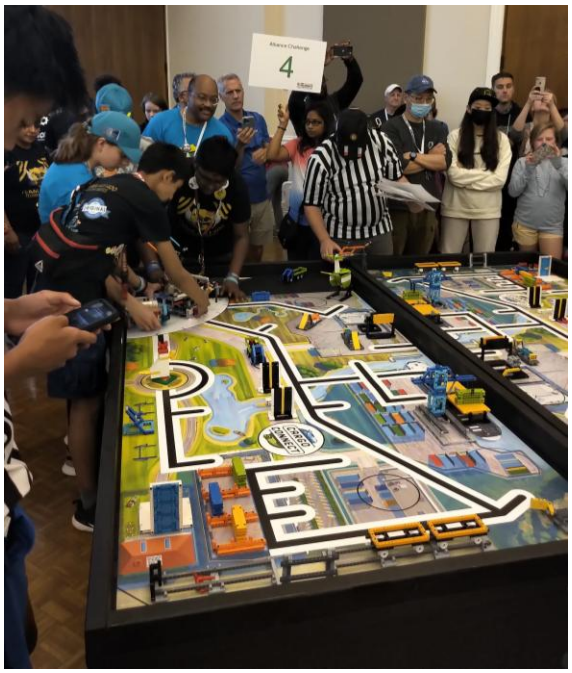




Awarded FIRST Mechatronics Engineering Scholarship ($5000) by the University of Waterloo

FIRST Robotics Competition

Fully autonomous robots, built and programmed from scratch were programmed to complete challenges on the playing field.



Coach/Mentor Award Winner

Athletic Program

Birchmount Exceptional Athlete Program, winning Paul M. Charters BEAP Athlete of the Year award 2020-2021.

Competitive Soccer

Played competitive soccer for 7+ years, with 6+ years playing at the provincial level.

Lifeguard

Certified National Lifeguard (Pool Option) with Emergency First Aid with CPR-C and Camp Counsellor Experience.

SHSM Manufacturing

Specialist High Skills Major in the Manufacturing Sector, featuring high school Co-op.