

University of Waterloo
Co-operative Work Terms

Graeme Begg
21160864

1B Mechatronics Engineering, Honours, Co-operative Program

Work Term	Employer	Evaluation
Jan - Apr 2025	Waterloo Experience (WE) Accelerate Program Microsoft - Azure & Artificial Intelligence Fundamentals Waterloo Ontario Canada Avanade - Healthcare Project B: Promoting a Healthy Lifestyle	EXCELLENT

Planned Future Work Term(s)

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

Disclaimer: This evaluation does not constitute an employment endorsement or recommendation. Employer evaluations of student contributions and achievements during the work term are conducted as part of the University of Waterloo's Co-operative (Co-op) Education model. Like academic grades, overall evaluations are part of the assessment of a student's progress in the co-op portion of their degree studies. These assessments are completed using criteria set out by the University, not the employer, and do not reflect the employer's criteria or assessment metrics.

Graeme Begg
gbegg@uwaterloo.ca
+1-647-425-8884

8 July, 2025

Dear Kiwi Charge Team,

I'm excited to apply for the Electrical Engineering Intern position at Kiwi Charge for the Fall 2025 term. As a Mechatronics Engineering student at the University of Waterloo with strong experience in embedded systems, motor control, and sensor integration, I'm eager to contribute to the development of your autonomous mobile charging robots.

Recently, I worked with **Waterloo Biomechatronics** to design a custom **PCB in KiCAD**, integrating an **STM32 microcontroller** with **MyoWare EMG sensors** and motor drivers to enable precise prosthetic hand control. I handled everything from signal conditioning and analog circuitry to embedded C programming and live testing. I've also used **oscilloscopes, multimeters, and power supplies** to troubleshoot and verify real-time performance across multiple hardware layers.

I'm comfortable working with **motor control systems**, and I've configured **PWM, UART, and I2C** interfaces for motors, encoders, and sensors. I also have experience with prototyping tools like Arduino and Raspberry Pi, and am familiar with **sensor fusion**, basic kinematics, and localization concepts from both coursework and personal robotics projects.

What excites me most about Kiwi Charge is the real-world application of robotics to solve infrastructure challenges in EV adoption. The chance to work closely on **powertrain development, custom PCB testing, and electromechanical troubleshooting** in a fast-moving startup environment is exactly the kind of experience I'm looking for.

Thank you for considering my application. I've included my resume, transcript, and work history, and would love the chance to contribute to Kiwi Charge's mission this fall.

Sincerely,
Graeme Begg

Graeme Begg

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SKILLS

Hardware: Altium, KiCAD, Eagle CAD, Easy EDA, PCB Circuitry, PID, Soldering, Oscilloscope, DMM, Arduino
Software: ROS2, Python, Java, C, C++, 6502 Assembly, Matlab/Simulink, Linux, Git, Azure, Microsoft Office
Mechanical: AutoCAD, SolidWorks, Fusion 360, 3D Printing, Machining

EXPERIENCE

Mechatronics Engineer

May. 2025 – Present

Waterloo Biomechatronics

Waterloo, ON

- Designed a custom PCB using **KiCAD**, integrating an **STM32 microcontroller**, MyoWare sensors, and onboard charging and power circuitry to enable a client to control and precisely operate a fully functional prosthetic hand
- Leveraged **SolidWorks** to design a spool system, translating motor movement into precise robotic hand control

FIRST Robotics Team Member

Jan. 2023 – June 2024

FRC Team 854

Toronto, ON

- Created 3D models of a jig system using **Fusion 360**, improving robot functionality and boosting stability by **35%**
- Programmed drive and motor control for an FRC robot in **Java**, enabling precise and responsive maneuvering
- Designed, implemented, and refined electromechanical components, increasing robot functionality and reliability
- Operated machining tools to manufacture and finish components for the support and movement of a mobile robot

Dynamics and Controls Engineer

Sep. 2024 – Dec. 2024

Waterloo Rocketry

Waterloo, ON

- Constructed and simulated a trial rocket using **OpenRocket**, allowing for proper machining and flight testing
- Enhanced rocket stability through performing research and simulations on the effects of fin flutter at high speeds
- Gained advanced controls and CFD knowledge through technical sessions, improving system modeling and analysis

Microsoft - Healthcare Innovation Project

Jan. 2025 – April 2025

University of Waterloo

Waterloo, ON - Remote

- Developed and deployed a lifestyle improvement app prototype, utilizing **Microsoft Azure** and **Azure AI**
- Built expertise in Microsoft Azure and AI through work, earning **Azure** and **AI Fundamentals certificates**
- Deployed cloud computing technologies through Azure to build and train an AI model prototype and pipeline

PROJECTS

Three Axis Robotic Arm | C, SolidWorks

- Designed and coded a **4-DOF** robotic arm as a proof of concept for manufacturing, surgical, and lab automation
- Developed real-time **embedded C** control algorithms to manage three-axis movement and sensor-driven feedback
- Leveraged **SolidWorks** to design and 3D print components necessary for robot functionality and load supporting
- Integrated and used microcontrollers, sensors, and stepper motors, ensuring precise movement and controllability

Autonomous Firefighting and Pathfinding Robot | Arduino IDE, C++, PID

- Developed an autonomous robot using **Arduino** and **C++** for real-time pathfinding and flame extinguishment
- Utilized **PID** and **A*** algorithms for effective path optimization, flame pathfinding, and precise navigation
- Navigated throughout the maze, extinguished the fire, and returned from the maze with a **95%** success rate

Ping Pong using LED Matrix Multiplexing | C, Easy EDA

- Utilized **C** to develop a program that allows two players to play Ping Pong on an 8x8 LED matrix display board
- Constructed a schematic circuit layout using **Easy EDA** to document and visualize the physical circuit design
- Designed and built a physical circuit layout by applying electrical component knowledge and circuit design skills

Moisture Sensor Circuit Board | Eagle CAD, Easy EDA

- Utilized **Eagle CAD** to design a digital PCB layout, allowing for successful part integration and PCB printing
- Integrated electrical components into the PCB using soldering techniques, resulting in proper circuit functionality
- Leveraged **Easy EDA** to design a schematic circuit diagram used as a blueprint for PCB design and formulation

EDUCATION

University of Waterloo

Waterloo, ON

Candidate for Bachelor of Applied Science in Mechatronics Engineering

Sep. 2024 – May 2029

- Relevant Coursework: Circuits, DS&A, Linear Algebra, Statics, Calculus 2, Properties and Structures of Materials

UNIVERSITY OF WATERLOO

UNOFFICIAL GRADE REPORT

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Fall 2025

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

Spring 2025

MTE	119	Statics
MTE	140	Algorithms & Data Structures
MTE	120	Circuits
MTE	111	Material Struct & Props
MATH	118	Calculus 2 (Eng)
GENE	120	First-Year Eng Seminar
MTE	100B	Seminar
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

MTE	121	Digital Computation	63
MTE	100	Mechatronics Engineering	89
CHE	102	Chemistry for Engineers	71
MATH	116	Calculus 1 (Eng)	81
GENE	119	First-Year Engineering Seminar	
MATH	115	Linear Algebra (Eng)	67
Term Average:	75.55	Decision:	Good Standing

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SKILLS

Software: AutoCAD, SolidWorks, Fusion 360, Microsoft Office, Azure, Eagle CAD, Easy EDA, Linux, Git, ROS2

Hardware: PCB Circuitry, Arduino, Soldering, Oscilloscope, Digital Multimeter, 3D Printing, PID

Languages: Python, Java, C, C++, 6502 Assembly, Matlab/Simulink

PROJECTS

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- Strengthened controls and CFD knowledge through information sessions, improving control systems capabilities

Engineering Intern

Feb. 2025 – April 2025

Engineers of Tomorrow (EoT)

Toronto, ON - Remote

- Led a project to revitalize the EoT merchandise store, leading to a new revenue stream for the organization
- Enhanced user experience by performing quality control testing on intake forms, ensuring a smooth onboarding
- Directed a research project by collecting and organizing data to support informed decision-making by supervisor

FIRST Robotics Team Member

Jan. 2023 – June 2024

FRC Team 854

Toronto, ON

- Operated machining tools to manufacture and finish components for the support and movement of a mobile robot
- Created 3D models of mechanical components using **Fusion 360**, promoting their development and actualization
- Designed, implemented, and refined electromechanical components, increasing robot functionality and reliability

EDUCATION

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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