

CONTACT

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EDUCATION

UNIVERSITY OF WATERLOO
2020 - 2025

- BASc in Mechatronics Engineering, Co-op - Dean's Honours

TECHNICAL SKILLS

Programming & Simulation

- Python, C/C++, MATLAB, Simulink, Java, Git, APIs, Databases, SolidWorks, AutoCAD

Embedded & Hardware

- MCUs (ESP32, ARM Cortex, Arduino), Sensors & Actuators, Bluetooth (BLE), CAN, LIN, Ethernet, Motor Control

Control Systems

- PID, State-Space, Kalman/UKF, System Identification, Nonlinear & Multivariable Dynamics, Youla Parametrization

Data & Signal Processing

- Signal Filtering, Feature Extraction, NumPy, Pandas, TensorFlow, Keras, Scikit-learn

RECOGNITIONS

- Graduated with Dean's Honours
- Term Distinction (multiple)
- UWaterloo President's Scholarship
- Capstone - Special Merit Award & Best Prototype Nomination
- Varsity Badminton Athlete - Most Improved & Rookie of the Year
- Canadian National University Badminton Championships - Gold (2024) & Silver (2025)

CONNOR JOHANSON

Passionate mechatronics engineer specializing in **sensor fusion**, **control systems**, and **embedded development**. Skilled in designing and integrating **hardware/software systems** to extract actionable insights from sensor data, with applications in **wearable technology**, **position tracking and control**, and **automation**. Recognized for **critical thinking**, **adaptability**, and **collaborative leadership**.

WORK EXPERIENCE

- Antenna Positioner Design & Integration** May 2024 - Aug 2024
UWaterloo EmRG Lab
 - Developed a motorized 3-axis antenna positioner by integrating motors, drives, power electronics, and control hardware.
 - Designed MATLAB-based control software achieving repeatable angular positioning within $\pm 0.5^\circ$.
 - Delivered cost-effective solution (\$800) approaching the performance of \$15,000 commercial alternatives, now actively used in lab.
- Manufacturing Product & Test System Engineering Designer** Sep 2023 - Dec 2023
Ford Motor Company
 - Devised a validation procedure to analyze ECU manufacturing test stations, reducing assessment time significantly.
 - Collaborated with engineers to troubleshoot functional hardware, RF signals, and software integration issues.
- Research Support & Web Development** Jan 2023 - Apr 2023
UWaterloo VIP Lab
 - Developed automated research lab website (vip.uwaterloo.ca) and performed SAR data acquisition/analysis.

PROJECTS

- Rally and Rehab - Award-Winning Capstone** Sep 2023 - Dec 2023
Wearable Motion-Tracking System *ESP32, Bluetooth (BLE), IMUs, Python*
 - Led team and developed a sleeve embedded with IMU sensors for racket sport biomechanical analysis.
 - Implemented Bluetooth Low Energy communication and embedded software on ESP32-S3 for continuous data streaming.
 - Applied Kalman filtering, feature extraction, and database integration to deliver real-time and historical performance dashboards.
- Doppler-Based Vehicle Speed Estimation** Feb 2025 - Apr 2025
Signal Processing & ML *Python, MATLAB, TensorFlow/Keras*
 - Processed audio recordings of passing vehicles, generating mel spectrograms and identifying Doppler shifts.
 - Trained CNN models for speed prediction with average error of 2.7 km/h.
- Inverted Pendulum Ball-on-Beam Control** Sep 2024 - Dec 2024
Dynamic System Modeling & Control *MATLAB, Simulink*
 - Modelled nonlinear behaviour and applied discrete control techniques to create a cascaded digital control system.