Andrii Bessarab

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Education

University of Waterloo

BASc, Mechatronics Engineering (Co-op) *2025 – 2030*

Cumulative Average: 91.5% | President's Scholarship of Distinction

Courses: Circuits (92%), C++ Digital Computation (96%), Algorithms & Data Structures (91%), Digital Logic (current)

Technical Skills

Languages: C++, C, Python, C#, Java, TypeScript, JavaScript, SQL
Embedded & Hardware: UART, Raspberry Pi, Arduino, Linux, ROS 2, Soldering, Altium Designer
Tools & Testing: Git, GitHub Actions, CMake, Bash, Unit Testing (Jest, xUnit, Moq)
Software & Cloud: .NET, Azure, Azure DevOps

Experience

Loadlink Technologies

Software Engineering Intern (Full Stack) *Aug – Dec 2026*

- Built CI test infrastructure in Azure DevOps that deploys a web build of the React Native app to an Azure container and runs Playwright suites on every merge to develop in ∼20 min, replacing days of manual pre-release regression testing.
- Designed the GA4 event schema (∼2M events/day) and a nightly C# microservice exporting the events to Azure Blob Storage.

Software Engineering Intern (Mobile) *Jan – Apr 2026*

- Designed and shipped biometric login (Face ID and Android biometrics) for the React Native app, storing credentials in the iOS Keychain and Android Keystore and enabling Auth0 refresh tokens; cut login time from ∼20 s to under 2 s.
- Built GitHub Actions PR gates (lint, unit tests, build) that block failing merges, ending manual cleanup of broken code.

FIRST Robotics Team

Lead Robotics Programmer & Student Coordinator *Nov 2022 – May 2025*

- Built the team's Java codebase from scratch (swerve drive, AprilTag localization, autonomous path following) and guided the team to 12th of 50 in its Provincials division and its first 3 straight Provincial qualifications.

Projects

Quadruped Robot *Apr – Jul 2026*

- Wrote a C++ ros2_control hardware interface driving 12 Feetech serial servos over a 1 Mbps UART bus, with synchronized bus writes, per-cycle position and speed clamping, and full state readback (position, velocity, load).
- Added safe startup: servo health checks, current-pose seeding to prevent joint snapping, and change-only EEPROM writes.
- Built a 100 Hz phase-based gait planner (crawl, trot) in C++ ROS 2 Jazzy on a Raspberry Pi 5, with geometrically derived inverse kinematics.
- Validated gaits in Gazebo, then teleoperated a crawl (forward, backward, turning) on the self-designed, 3D-printed, hand-wired robot.

Skewb-Puzzle Solving Robot (Skewbot) *Oct – Dec 2025*

- Built the pyserial link to the VEX IQ brain and on-brain sensor checks that verify cube placement before motors move.
- Coded and tuned bidirectional PID motor control to overcome the puzzle's magnetic detent resistance, raising solve reliability from 1 in 5 to 9 in 10, each solve under 10 s.
- Co-wrote a C++ BFS solver precomputing all 3.1M states offline into an onboard bit-packed file, read in chunks to fit in RAM; wrote the normalizer that rotates any scan into the database's fixed-corner orientation.

Driver-Station Input Panel (OperatorBoard) *Feb – Apr 2025*

- Wrote C++ firmware for a Pro Micro (ATmega32U4) that scans 30 inputs through 2 multiplexers with a 200 ms press lockout and enumerates as a USB HID joystick for the FRC driver station; designed, wired, and soldered the panel solo.

LDO Regulator Board (WARG Electrical Bootcamp) *Sep 2026*

- Designed a 2-layer 2S LiPo to 5 V LDO board (LM2940) in Altium, oversizing the output capacitor for DC-bias derating and adding series resistance to keep ESR in the stable range.

Awards

- Best Hackathon Presentation (of 50 teams), Toyota Innovation Challenge 2026
- Best Use of Algorithms (of 23 teams), RythmHacks 2025
- Senior Distinction, Canadian Computing Competition 2025