

# WILL STEEDMAN

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## Education

### Queen's University - Smith Engineering

Graduating April 2027

*Bachelor of Applied Science, Mechatronics and Robotics Engineering*

*GPA: 3.82 / 4.0*

**Activities:** Queen's VEX Robotics, Queen's BAJA Design Team, APSC 172&221 Teaching Assistant, Intramural Hockey

## Experience

### Honda Canada Manufacturing

May 2025 – Present

*Electrical Engineering Intern*

*Alliston, ON*

- Led an \$110K initiative to commission first machine learning inspection systems for Honda CR-V weld cells, reducing inspection related downtime by 98%, correcting 2.5k defective units/year, and securing buy-in through presentations to plant managers
- Built spot-weld anomaly tracking application to remotely monitor 2.5 million spot welds daily, preventing a potential \$1M+ in scrap body losses and deploying software across 4 Honda/Acura facilities in North America
- Designed, programmed, and updated drawings for Omron CJ PLCs for hood and tailgate hem press jig change machines, replacing end-of-life Yaskawa PLCs under time pressure to ensure 100% cell uptime
- Served as department subject matter expert for machine vision systems, designing, modifying and implementing 15+ vision systems, achieving a 78% reduction in visual inspection downtime in one instance

### Sensorimotor Exploration Lab

October 2024 – May 2025

*Research Assistant*

*Kingston, ON*

- Implemented inverse kinematics and trajectory control in C++ for a Kinova Gen3 6-DOF manipulator used in human motor-learning experiments, reducing positional jitter by 10x compared to previous implementation
- Redesigned a robot end effector for handwriting experiments, using FEA to balance structural strength, improve ergonomics for human subjects, and reduce fabrication cost by 40%

### Ingenuity Labs Research Institute

May 2024 – August 2024

*Undergraduate Student Researcher*

*Kingston, ON*

- Implemented ROS 2 and C++ controls for a KUKA 7-DOF manipulator and fused Vicon and Meta Quest hand-tracking streams in real time at 1000 Hz across 200 experimental trials
- Analyzed synchronized trajectories from 2 virtual reality headsets to quantify 3 performance metrics—positional error, jitter, and latency—measuring best-condition average errors of 1.22 cm and 1.73 cm
- Co-authored a peer-reviewed IEEE TVCG paper establishing a repeatable robotic framework for markerless hand-tracking evaluation, cited 24 times as of July 2026

## Projects

### Custom High-Precision 1 kW Actuator | KiCad, STM32

January 2025

- Designed and routed a 4-layer, 3-phase motor-controller PCB for a 1 kW BLDC drive, integrating an STM32 microcontroller, gate driver, six-MOSFET inverter, current sensing, regenerative-braking protection, and 100 V-to-3.3 V power conversion
- Developed embedded C firmware for six-step commutation, synchronized PWM, encoder and current acquisition, fault handling, and CAN communication; established the architecture for 10 kHz field-oriented control
- Designed and assembled a modular 19:1 cycloidal actuator using a T-Motor MN6007 II, custom inverter, and 3D-printed structure; measured 26 N·m output torque at 30 A

### Director of Mechanical Design, Queen's VEX Robotics | Project Leadership, CAD

May 2024-May 2025

- Managed a team of 10 students through the design, prototype, and assembly phases of four autonomous wheeled robots, winning the VEX AI Skills World Championship, VEX World Championships 2025 Build Award (best built robot), and 12 awards at 4 North American tournaments

## Skills, Certifications & Awards

**Mechanical:** SOLIDWORKS, Onshape, CATIA V5, Siemens NX, GD&T, FEA, CNC machining, 3D printing

**Electrical & Embedded:** KiCad, Altium, LTspice, PCB layout, STM32, ESP32, Arduino

**Software & Robotics:** C, C++, Python, Git, Linux, Qt, ROS 2, Omron PLCs, FANUC, KUKA FRI, Kinova API, Cognex

**Credentials:** CSWP; Lean Six Sigma Green Belt; Honda Motor Co. Best Quality Gold Award (1st of 78 submissions);

NSERC USRA(\$10k); Queen's University Principal's Scholarship (\$5k)