Johnson Yep

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Education

University of Waterloo — Waterloo, Ontario
Mechatronics Engineering, Honours, Co-operative Program — Apr 2030

Experience

Toyota Boshoku — Jan 2026 - May 2026
Robotics Engineering Intern — View Work

- Developed and implemented an end-to-end computer vision and autonomous mobile robot (AMR) system for rack transport. Used **Python** and **OpenCV** to perform real-time rack detection and integrated the system with **Allen-Bradley PLCs** and AMR workflows to automate the movement of **100**+ racks per shift.
- Configured and deployed Keyence **computer vision** cameras for defect detection; **preprocessed** and **labeled image datasets** to train AI classification models, improving inspection accuracy and reducing defective parts reaching downstream processes.
- Developed **PLC ladder logic** and **HMI dashboards** for AMRs and production-line machines, delivering real-time status, maps, and analytics that improved troubleshooting, reduced downtime, and supported scalable deployment.
- Analyzed machine step-time data and applied root cause analysis to identify production bottlenecks to help reduce cycle time by **3 seconds** per vehicle door set, saving **15 minutes** of production time daily.

WATonomous — May 2026 - Present
Humanoid Robotics Team — View Work

- Trained a reinforcement learning (PPO) policy using **PyTorch** in NVIDIA **Isaac Lab** for a SO-ARM101 arm to push objects via contact-only manipulation; wrote **11** custom shaped reward terms and a performance-gated curriculum to reach an **85%** success rate on fully randomized spawn positions, and exported the policy to ONNX for **sim-to-real** deployment.
- Created **10** clean datasets for training a humanoid arm to stack cubes, using **cuRobo** to generate seed demonstrations and **MimicGen** to scale them to **1,000**+ trials.
- Integrating a tactile sensor into a humanoid robot hand; simulating a closed-loop control pipeline in **Isaac Lab** that adjusts joint torques over **CAN** bus based on real-time feedback for precision grasping

uWaterloo Formula Electric — Sep 2025 - May 2026
Driveline Team — View Work

- Designed and manufactured jigs in **SolidWorks** for push bar drilling and motor mounting; producing **GD&T** drawings, water-jetted aluminium parts, and machined features to ±0.1 mm tolerance.
- Measured a physical radiator with calipers, created a CAD model in **SolidWorks**, and integrated it into the driveline **SVN** master assembly to verify fit and clearances.

Projects

Hand Tracking Computer Vision Guitar *Python, OpenCV, MediaPipe* — View Project

- Developed a virtual guitar that converts real-time hand and finger movements into chords and notes.

Autonomous Checkers Robot *C++, VEX Robotics* — View Project

- Built an autonomous checkers robot that detects board pieces, selects moves, and moves pieces.

Space Race *Java, JavaFX* — View Project

- Developed a 2D shooter game from scratch, designing gameplay, UI, and architecture end-to-end.

Certifications

CS50x: Introduction to Computer Science, Harvard University — View Certificate

Skills

- **Languages:** Python, C++, Java
- **ML & Robotics:** PyTorch, TensorFlow, Isaac Lab, cuRobo, MimicGen, OpenCV, MediaPipe
- **Embedded & Controls:** CAN, STM32, PLC Ladder Logic (Allen-Bradley), HMI Development
- **CAD & Manufacturing:** SolidWorks, AutoCAD, GD&T, 3D Printing
- **Developer Tools:** Git, Docker, Linux, Claude Code, SVN, Rockwell Automation Software