Osamah Alshahri

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Education

Algonquin College — Ottawa, ON
Bachelor of Engineering, Automation and Robotics Engineering — *Expected May 2027*

Technical Skills

Programming & Embedded: C/C++, Python, Embedded C++, FreeRTOS, MATLAB, Simulink, LabVIEW, Linux, Git
Electronics & PCB: Autodesk EAGLE schematic capture & PCB layout, soldering/rework, board bring-up, multimeter testing
Robotics & Controls: FANUC LR Mate 200iD, OpenMANIPULATOR-X, TurtleBot3, ROS 2, Nav2, MoveIt 2, Gazebo
Industrial Automation: Allen-Bradley Studio 5000, PLC Ladder Logic, Structured Text, HMI design, I/O & interlocks
Computer Vision: OpenCV, YOLOv8, Keyence vision, camera calibration (solvePnP, cornerSubPix), HSV segmentation
CAD & Prototyping: SolidWorks, Fusion 360, Onshape, Autodesk CFD, 3D printing, laser cutting, CNC

Clubs & Activities

Algonquin Robotics Club — Ottawa, ON
Member — *2024 – Present*
- Collaborate with a student team on hands-on robotics projects and builds outside of coursework.

Experience

Assistant Equipment Specialist (Co-op) — May 2023 – Aug 2023
Siemens Healthineers — *Ottawa, ON*
- Built and validated a LabVIEW thermal-card calibration tool with Excel-based analysis that **cut calibration time from two days to about an hour** and **raised data resolution from 180 to over 1,000 points** across roughly 50 cards.
- Worked with the calibration, production, and engineering teams to track down equipment and workflow failures, then wrote up the findings that led to the fixes.
- Ran and maintained a Tormach 770M CNC and the 3D printers on a **regulated medical-device line**, working to its **ISO-aligned** safety and quality standards.

Projects

Autonomous Warehouse-Sorting Robot | *ROS 2, Nav2, OpenCV, Python* — 2026
- Built an **autonomous mobile manipulator** (TurtleBot3 Waffle Pi with OpenMANIPULATOR-X) that maps a warehouse, then picks and places inventory with **no operator in the loop**.
- Tuned the **Nav2** stack and costmap parameters until localization stayed solid and the robot reached its goals reliably at speed, and ran the ROS 2 workspace with colcon.
- Wrote a Python/OpenCV pipeline that finds 4 cm cubes by HSV segmentation and works out camera-to-world transforms with **cv2.solvePnP()** for accurate grasping.

Real-Time Object Tracking & World Calibration | *Python, OpenCV, NumPy* — 2026
- Calibrated camera intrinsics using an 8x11 checkerboard with cv2.cornerSubPix() refinement, reaching a **1.26 px RMS reprojection error**.
- Pulled the target's bounding box, contour, and centroid out of the feed using **HSV segmentation** and morphological filtering.
- Mapped tracked points to world coordinates with **cv2.solvePnP()**, logging X/Y/Z trajectories and a live 3D axis overlay on the video.

Automated Robotic Bartender, FANUC 6-Axis Cell | *Studio 5000, Ladder Logic, HMI, Embedded C++* — 2025
- Designed and integrated a robotic drink-preparation cell around a **FANUC LR Mate 200iD 6-axis robot**, an **Allen-Bradley PLC (Studio 5000)**, and an operator HMI for recipe selection.
- Programmed PLC routines in **Ladder Logic and Structured Text** to coordinate robot I/O, dispensing states, ice loading, liquid pours, and reset sequencing.
- Built an Arduino/Embedded C++ ice subsystem (2x Mega 2560, HX711, 5 kg load cell, 12 V auger motor) and hand-soldered the sensor and motor-driver electronics, hitting **±1 g accuracy across 8 trials** at a 40 g target.
- Integrated 6 Bar Butler nozzle channels (45 mL per shot) and delivered the cell on a **$58.03 CAD bill of materials, under the $100 budget**.