

Ali Mohammed-Ali

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EDUCATION

Bachelor of Engineering Science, Electrical Engineering — Western University

Expected 2029

Relevant coursework: Principles of Design (Altium PCB), Electrical Laboratory I, Digital Logic Systems (DE10 FPGA), Networking, Electronic Circuits*, Microprocessors & Microcomputers* (*2026–27)

Awards & certificates: Undergraduate Summer Research Internship Award (2025), Dean's Honours Award (2024), IPEX iCare Scholarship (2024); Advanced Electrical Shop Training (2025), Advanced Machine Shop Training (2024)

ENGINEERING EXPERIENCE

Engineering Student — POET-STRATOS Stratospheric Balloon Payload

May 2025 – Aug 2025

Western University, Dept. of Physics & Astronomy | flown from the CSA/CNES balloon base, Timmins, ON

- Wrote C++ register-level control of a 12-bit infrared camera's exposure, gain and cooler over RS-232, verifying every write by read-back; built as a DLL under the Python flight software, which started itself at boot for unattended operation.
- Built a Python telecommand and downlink system over UDP (packet retransmission, image compression), validated under simulated packet loss; it ran the full 3-hour flight at ~33 km and returned 100+ images.
- Built thermal monitoring and control: converted raw sensor readings to °C from the camera's factory calibration, held its thermoelectric cooler at a commanded setpoint, and logged temperature with every image.
- Found a camera firmware defect that truncated images at specific exposure times: tested a range of settings to isolate the failing values, worked with the manufacturer's engineers, and restricted flight operations to verified settings.
- Diagnosed intermittent PCIe FIFO overflows on a Camera Link frame grabber: found through disassembly, manuals and the BIOS that the host offered an x1 link to a card designed for x4; worked with the vendor on bit-packing to cut bandwidth 25%.
- Verified the payload-gondola interface cable against CSA/CNES interface requirements with continuity and end-to-end tests; wrote the payload operations manual.

Solar Array Team Member — Sunstang Solar Car, Western University

Sep 2026 – present

- Assigned to the solar power team: MPPT power electronics for the array, then CAN bus for high-voltage motor control.

Mechanical Team Member — Western Engineering Mars Rover (WEMars)

Oct 2024 – Apr 2025

- Designed a pan-tilt camera system in SolidWorks and drove its servos from an ESP32 over Wi-Fi, giving drivers remote situational awareness at the Canadian International Rover Competition (CIRC).

Electrical & Controls Team Member — Western Engineering Robotics (WEBots)

Sep 2023 – Apr 2025

- Interfaced a Raspberry Pi with the robot's motor controllers over CAN bus; soldered and assembled PCBs, validated power-distribution wiring, and wrote a technical report on the motor-control network.

PROJECTS

Diminished Reality on iPhone | Swift, ARKit, Core ML, OpenCV

2026 – present

- Offline app that removes a tapped object from the live camera view on a 4 GB iPhone 13 with no LiDAR; shipped only inpainting methods cleared for commercial use via Google Patents and model licences.
- Moved the tracking model to 16-bit to run on the Neural Engine (2.4× faster per run) and capped its rate, delaying thermal throttling from ~3.5 to ~6 minutes.

Smart Walking Aid — ECE 2242 Design Project | Altium, Arduino, MATLAB

Feb – Apr 2026

- Team of three: designed the device's Arduino-shield PCB in Altium (schematic, layout, Bill of Materials), with a ground pour and 40 mil power traces sized for a servo's current spikes.
- Debugged bring-up with a diagnostic schematic of the 5 V rail and continuity testing; curve-fitted measured performance in MATLAB against the firmware model.

HERO — Emergency Response App | React Native, Node.js

Mar 2025

- Team of five: app coordinating rides, first aid and hazard reports during floods and fires. 2nd overall and 1st in Transportation at Western's engineering design competition.

OTHER EXPERIENCE

Customer Service Representative — FreshCo, London, ON

Sep 2020 – Nov 2025

- Part-time through high school and university; handled 100+ transactions per shift accurately and supported other departments.

SKILLS

Hardware & lab: Altium Designer, SolidWorks, soldering and rework, board bring-up, oscilloscope, multimeter, bench power supply

Embedded & interfaces: RS-232, CAN bus, SPI, I2C, Camera Link, PCIe (debug), TCP/UDP; Arduino, ESP32, Raspberry Pi

Programming & tools: C, C++, Python, Swift, Java, MATLAB; Git, Linux/macOS, Wireshark, OpenCV, Core ML, Intel Quartus

Languages: English, French (DELFI B2)