

ABDULRAHMAN ALMANSY

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PROFESSIONAL SUMMARY

Mechanical-design-focused Mechatronics Engineering (Hons) graduand (Expected OCT 2026) with hands-on experience in static FEA, topology optimization, vibration-aware dynamic analysis, and on-site mechanical commissioning through the Connect 6ix transit project in Toronto. Proficient in SolidWorks Simulation, AutoCAD, MATLAB/Simulink, and CAM toolpath generation, with a working foundation in failure investigation (FMEA/RCA), preventive maintenance program development, and CSA/ASME design considerations. EIT-eligible and on track for PEng licensure with PEO upon graduation.

EDUCATION

Bachelor of Mechatronics Engineering (Hons) | Asia Pacific University

SEP 2021 – OCT 2026 (Expected)

Relevant Coursework: Machine Design, Engineering Design, Control Systems, CAD/CAM, Industrial Automation & PLC, Robotics & ROS2, Embedded Systems.

IGCSE | Cambridge International School

2019 – 2021

Related Coursework: Physics, Chemistry, Mathematics, Environmental Management.

RELEVANT PROJECTS

Automotive Suspension Bracket — Static FEA & Topology Optimization (SolidWorks Simulation)

- Reduced bracket mass by 28% while maintaining a factor of safety above 2.5 by executing topology optimization on a 6061-T6 aluminum component under 5 kN loading.
- Validated structural integrity against ASME design margins by performing static FEA with a mesh convergence study, achieving <5% von Mises stress variance across three refinement steps.
- Generated 5-operation CAM toolpaths (facing, contouring, pocketing, drilling, finishing) reducing estimated machining time by 15% through tool-path and feed-rate optimization.

Autonomous Warehouse Robot — ROS2, SLAM, Nav2 (TurtleBot3, Gazebo Harmonic)

- Achieved 92% waypoint navigation success rate across a 10 m × 8 m custom warehouse world by tuning Nav2 cost-maps, AMCL localization parameters, and DWB controller gains in ROS2 Jazzy.
- Diagnosed 5 localization-failure modes through root-cause analysis of TF tree, sensor timing, and odometry drift logs — mirroring failure-investigation workflows used on industrial AGV/AMR fleets.
- Documented the full perception-to-actuation pipeline (SLAM → localization → planning → motion control) in a commissioning-style technical report enabling reproducible deployment.

PLC-Controlled Pneumatic Pick-and-Place Turntable

- Eliminated 3 sequence race conditions during commissioning by performing FMEA on ladder rungs and re-architecting interlock logic using online PLC monitoring.
- Commissioned a repeatable pick-rotate-place cycle with ±50 ms timing consistency by mapping digital I/O between solenoid valves, limit switches, and pushbuttons, and configuring totalizing timers (TTIM 001/003/005).
- Designed E-stop and interlock logic per safety-circuit best practices, validated through 100+ cycle dry-runs prior to handover.

Autonomous Obstacle-Avoiding Vehicle — Real-Time Control

- Reduced sensor-to-actuator reaction latency by ~20% across 50 bench-test runs by tuning ultrasonic threshold logic, DC motor PWM response timing, and applying low-pass filtering on range measurements.

PROFESSIONAL EXPERIENCE

MEP Intern — Webuild, Connect 6ix Project (Toronto, ON)

Oct 2025 – Feb 2026

- Flagged 12+ mechanical installation discrepancies between as-built site conditions and shop drawings by conducting on-site inspections of HVAC, piping, and mechanical room layouts against approved MEP packages on a major Ontario Line transit project.
- Tracked 40+ Requests for Information (RFIs) and supported tender-document control by maintaining revision-controlled drawing registers, equipment schedules, and material cost data feeding into the project's preventive maintenance program and procurement schedule.
- Coordinated with mechanical, electrical, and structural disciplines to review mechanical system installations against CSA and project-specific standards, supporting senior engineers in commissioning hand-off and quality sign-off.

SKILLS

Mechanical Design & Analysis: SolidWorks, SolidWorks Simulation (static FEA, topology optimization, mesh convergence), AutoCAD, CAD/CAM, GD&T fundamentals, mechanical drafting, ASME design considerations, dynamics & vibration analysis fundamentals.

Maintenance, Reliability & Control: Preventive maintenance program development, failure investigation, RCA, FMEA, mechanical commissioning; MATLAB/Simulink, PID control, system modelling, control loop tuning.

Industrial Automation & Hardware: PLC ladder logic, totalizing timers, Siemens / Allen-Bradley fundamentals, HMI & SCADA concepts; sensors (ultrasonic, LDR, proximity), actuators (pneumatic, DC motor, solenoid), microcontrollers (Arduino, STM32), DMM, oscilloscope, relay logic.

Project Delivery & Standards: P&ID and electrical schematic reading, MEP drawing review, RFI tracking, tender-document control, material cost estimation support, construction-site safety, CSA awareness; Python, C/C++, MATLAB scripting, Git, ROS2, CNC Simulator Pro, Bluebeam Revu.

Professional Standing: EIT-eligible, on track for P.Eng licensure with PEO upon graduation (Jul 2026).