ABDULRAHMAN ALMANSY

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PROFESSIONAL SUMMARY

Mechatronics Engineering (Hons) graduate currently working as an MEP Coordinator (Intern) with Webuild on Toronto's Ontario Line, coordinating MEP scope across four RSSOM buildings. Works across software, controls, and hardware: Python and C/C++ on microcontrollers (Arduino, STM32, ESP32), ROS2 robot navigation (SLAM, Nav2), Omron PLC ladder logic with interlock and E-stop design, and a tested, deployed explainable-ML fault-diagnosis system for PV arrays (XGBoost, SHAP, Streamlit).

EDUCATION

Bachelor of Mechatronics Engineering (Hons) | Asia Pacific University **2021 – 2026**
Relevant Coursework: Embedded Systems, Control Systems, Industrial Automation & PLC, CAD/CAM, Machine Design, Engineering Design.

IGCSE | Cambridge International School **2019 – 2021**
Related Coursework: Physics, Chemistry, Mathematics, Environmental Management.

PROFESSIONAL EXPERIENCE

MEP Coordinator (Intern) — RSSOM Package, Ontario Line | Webuild, Connect 6ix Consortium **Nov 2026 – Present**

- Coordinating MEP scope for the Gatehouse, Maintenance Building (MB), TPSS and MOW buildings, supporting the MEP Project Manager on design, submittals, procurement and construction follow-up.
- Preparing meeting minutes and action logs that track RFIs, priority submittals, procurement, scheduling and close-out items by building.
- Maintaining macro-free Excel trackers (e.g. ITP tracker) on SharePoint used by the MEP team to monitor inspection and test status.

MEP Intern — Toronto Ontario Line Rapid Transit | Webuild, Connect 6ix Consortium **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.
- Tracked 40+ Requests for Information (RFIs) and supported tender-document control by maintaining revision-controlled drawing registers, equipment schedules, and material cost data feeding the project's preventive maintenance program and procurement schedule.
- Coordinated with mechanical, electrical, and structural disciplines to review installations against CSA and project-specific standards, supporting senior engineers in commissioning hand-off and quality sign-off.

RELEVANT PROJECTS

PV Fault Diagnosis — Explainable ML Framework (Final Year Project)

- Built and deployed a fault-diagnosis system for photovoltaic arrays in Python, combining XGBoost with Tree SHAP explainability across 4 fault classes (open-circuit, short-circuit, partial shading, normal) from 5 electrical parameters (I, V, P, G, T): Macro F1 = 0.861, AUC = 0.968, 3.9 ms inference latency.
- Benchmarked XGBoost against RF, SVM, and CNN in a unified pipeline using both Tree SHAP and Kernel SHAP, quantifying the trade-off between predictive accuracy and physically interpretable feature attributions.
- Served the model through a Streamlit dashboard and voice-assistant interface backed by a 13/13-passing automated test suite, turning model output into a predictive-maintenance decision tool for renewable-energy assets.

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

- Achieved a 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 the TF tree, sensor timing, and odometry drift logs, mirroring failure-investigation workflows used on industrial AGV/AMR fleets.

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 Omron 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) with E-stop and interlock logic per safety-circuit standards.

Autonomous Obstacle-Avoiding Vehicle — Real-Time Embedded Control

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

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

- Reduced mass of a 6061-T6 aluminum bracket by 28% under 5 kN loading while holding a factor of safety above 2.5, validated by static FEA with a mesh convergence study (<5% von Mises variance over three refinements).
- Generated 5-operation CAM toolpaths, cutting estimated machining time by 15% through toolpath and feed-rate optimization.

SKILLS

Programming & Software: Python, C/C++, MATLAB scripting, ROS2 (Nav2, SLAM, TF), Git, scikit-learn, XGBoost, SHAP, Streamlit, automated testing.
Embedded & Control: Arduino, STM32, ESP32; PWM motor control, sensor filtering, real-time control loops; MATLAB/Simulink, PID control and tuning, system modelling.
Industrial Automation: PLC ladder logic (Omron), totalizing timers, interlock and E-stop logic, Siemens / Allen-Bradley fundamentals, HMI & SCADA concepts, relay logic; sensors (ultrasonic, LDR, proximity), actuators (pneumatic, DC motor, solenoid).
Mechanical & Field: SolidWorks, SolidWorks Simulation (FEA, topology optimization), AutoCAD, CAD/CAM, GD&T fundamentals; FMEA, RCA, commissioning support, P&ID and electrical schematic reading, MEP drawing review, RFI tracking, CSA awareness.