MUHAMMAD AFFAN NUR IMAN BIN AZMAN

Embedded Systems and Firmware | Mechatronic Engineering Graduate

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PROFESSIONAL SUMMARY

Mechatronic Engineering graduate from Universiti Sains Malaysia with hands-on experience in C/C++, Python, embedded systems and troubleshooting. Worked on hardware and software development for unmanned aerial, ground, surface water and underwater robots. Currently in touch on latest AI developments, agentic AI, AI tools to software development, debugging and engineering workflows. Self-motivated and able to learn independently, with strong self-awareness and an interest in turning new ideas into practical engineering solutions. Seeking an entry-level or Graduate Talent firmware engineering role, with practical skills in system integration, hardware testing and problem-solving.

TECHNICAL SKILLS

Programming C/C++, Python, assembly language, Python, Java, LabView, MATLAB

Embedded platforms ESP32, RP2040/Pico, micro:bit, Arduino, Raspberry Pi 5, Linux/Ubuntu.

Interfaces UART/serial, I2C, GPIO, MQTT, PWM, MAVLink, IP networking and Wi-Fi.

Debugging and testing Subsystem tests, fault isolation, command-response testing and Wireshark.

Engineering tools Git/GitHub, ROS 1/2, Gazebo, Altera Quartus/DE2-115, Omron PLCs.

RELEVANT ENGINEERING EXPERIENCE

Research Assistant in Unmanned Systems

Universiti Sains Malaysia, Penang — Feb 2026 - Present

- Developed custom python application for a dual link autonomous drone project using 5G cellular and RF radio with companion Raspberry Pi 5 computer.
- Developed custom USV-ROV software suite integration and deployment powered with Jetson Orin NX. Reverse engineering software for control mapping and data link telemetry for custom SDK.
- Diagnosed serial communication, IP network and software integration issues across controllers, Linux computers and robotic hardware using subsystem checks and command-response tests.
- Configured MAVLink routing and remote connectivity with MAVProxy, MAVLink Router and ZeroTier for drone telemetry tests.
- Worked with 3D LiDAR, 2D LiDAR and stereo cameras on unmanned robotic platforms.
- Maintained and troubleshot onboard computer systems for autonomous mobile robots (AMRs).
- Supervised 3 final-year project (FYP) students and assisted Master/PhD student on technical research.

Research Assistant in Unmanned Surface Vehicle Systems

Universiti Sains Malaysia, Penang | Petronas Research Sdn. Bhd. — Aug 2025 - Jan 2026

- Helped recover a Clearpath Heron M300 after onboard computer and SSD failure by rebuilding its Linux/ROS environment and checking hardware communication paths.
- Investigated ROS topic connectivity, propulsion commands, IP networking and IMU/GNSS interfaces to isolate faults and support functional recovery.

Robotics Engineering Intern

Cytron Technologies, Penang — Jul - Oct 2024

- Built educational robotics demonstrations with micro:bit and RP2040-based boards, using MicroPython and CircuitPython across sensor, display and actuator projects.
- Integrated motors, servos, distance sensors and user controls, then debugged wiring, I2C communication and program behaviour on physical robots.
- Produced 15 step-by-step tutorials for the MOTION 2350 controller and supported a Raspberry Pi AI-vision workshop at Politeknik Seberang Perai.

SELECTED EMBEDDED AND CONTROL PROJECTS

ESP32 Robot Control for Mini ROBOCON 2025

Embedded programming and hardware integration 2024

- Programmed an ESP32 robot to translate PS4 controller inputs into drive, servo and shooting-mechanism commands, including speed selection and actuator mapping.
- Interfaced a VL53L0X distance sensor over I2C and tested commands on the physical robot to verify control response and debug actuator behaviour.

Active Twin Gyrostabilizer for USV Stabilization

Final-year project, Universiti Sains Malaysia 2024 - 2025

- Designed and fabricate a twin-gyrostabilizer prototype to investigate roll and pitch stabilization of an unmanned surface vessel for wave countering stabilization.
- Developed PID control and tuning with sensor fusion algorithm, commanding servo-driven gyroscope precession to generate corrective torque. Integrated IoT flywheel motor control, operator enable/disable functions and data logging for automation on enormous design of experiment and data analysis.
- Tested the motor drive, gyroscope motion and feedback functions individually, then evaluated the integrated prototype in bench and pool trials under calm water and generated waves.

FPGA and PLC Programming

- Programmed the DE2-115 FPGA development board using Altera Quartus for hardware-control tasks and developed programs for Omron PLCs.

SEMICONDUCTOR EXPERIENCE AND TRAINING

Custom Layout Engineer Trainee

Vchip Sdn Bhd, Penang 22 Jun - 31 Oct 2026

- Completed 28 nm analog and 40 nm standard-cell layouts using Cadence Virtuoso and Siemens Calibre, including bandgap-LDO integration with DRC-clean and LVS-matched results.
- Investigated schematic-to-layout connectivity mismatches and physical-design rule violations using verification reports and circuit schematics.
- Built or customized Cadence SKILL utilities for labels, cross-rulers, metal-layer changes and editing bindkeys to support layout work.

PSDC Custom IC Layout Training

18 May - 18 Jun 2026. Trained in 32 nm CMOS and 14 nm FinFET digital layout, analog layout fundamentals and DRC/LVS verification using Synopsys Custom Compiler.

EDUCATION AND PROFESSIONAL REGISTRATION

Bachelor of Engineering in Mechatronic Engineering

Universiti Sains Malaysia | Graduated November 2025

Registered Graduate Engineer, Board of Engineers Malaysia | January 2026

LEADERSHIP AND LANGUAGES

Commissioned Second Lieutenant (Leftenan Muda), USM PALAPES. Technical Team Committee, USM Drone Club (2023 - 2024).

Malay (native), English (professional working proficiency), Mandarin (currently learning).