MAHMOUD KHAIRY

Mechatronics Engineer (Robotics, AI, & Autonomous Systems)

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Portfolio Website

Professional Summary

Highly motivated Mechatronics Engineer specializing in the design, development, and integration of intelligent, autonomous systems. Proven ability to combine advanced robotics (ROS2, Pixhawk, MAVLink) with AI-driven computer vision and robust mechanical design (SolidWorks). Seeking to leverage strong technical skills and hands-on experience, including an internship in aviation logistics, to drive innovation in complex automation projects.

Technical Skills

- **Robotics, AI, & Control:** Expert in ROS2 (Nav2, SLAM) and Pixhawk Flight Controllers. Proficient in MAVLink, PID Tuning, Autonomous Navigation, and AI/ML development using Python (PyTorch) for Semantic Segmentation and anomaly detection.
- **Engineering & Fabrication:** Expertise in SolidWorks and AutoCAD for mechanical design. Proficient in Industrial Automation, PLC Programming (Ladder Logic), sensor integration, and SCADA systems, with practical experience in FDM 3D printing.

Education

De Montfort University (DMU)
Master of Science in Engineering (MSc)
United Kingdom
2025-2026

Asia Pacific University of Technology and Innovation (APU)
Bachelor of Engineering (Hons) in Mechatronics Engineering
Malaysia
2021-2025

Work Experience

Kuwait Aviation Fuelling Company (KAFCO)

Mechanical & Electrical Intern

June 2024 – November 2024

- Supported fuel inventory management and quality control operations, ensuring strict adherence to aviation safety protocols and Joint Inspection Group (JIG) standards.
- Assisted maintenance and engineering teams with the routine inspection and diagnostics of automated fuel delivery and high-pressure pipeline logistics systems.
- Analyzed and documented daily operational flow and equipment utilization across the fuelling facility, contributing to a final report on process efficiency.

Projects

1. **AUTONOMOUS HEXACOPTOR DELIVERY SYSTEM (FYP) | 2025**

- Engineered a ZD 850mm hexacopter for autonomous delivery, managing payloads up to 2 kg with Pixhawk Pro navigation.
- Achieved high-precision flight, demonstrating an average waypoint error of < 1.6 meters and reliable ESP32-controlled payload release.

2. **AI-AUGMENTED DRONE HEALTH MONITORING & PARACHUTE SYSTEM | 2025**

- Developed an emergency safety system using real-time MAVLink telemetry (ESC/RPM monitoring) and AI semantic segmentation for identifying safe landing zones.
- Designed a parachute deployment mechanism that activates autonomously within < 1.5 seconds of critical failure detection.

3. **ROS2 AUTONOMOUS NAVIGATION WITH KEEP-OUT ZONE | 2025**

- Implemented robust mobile robotics using ROS2 (Nav2, Cartographer SLAM) on a TurtleBot3 for autonomous mapping and navigation.
- Created a centralized Python Html, Css & Js GUI and defined static keep-out zones to enforce safe routing around restricted areas.