Mohamed Ahsan
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Personal Profile

Final-year PhD researcher at Coventry University, specialising in flight dynamics and robust fault-tolerant control for UAVs. I have expertise in model-based designing, software-in-the-loop, hardware-in-the-loop and actual flight testing. With proficiency in Matlab, Python and C++, as well as modelling and simulation with Simulink, I am actively seeking opportunities in the field of flight control that aligns with my expertise and research interests.

Technical Knowledge

UAV Dynamics (Multirotor, Fixed Wing, VTOL); Control Laws (PID, Linear Quadratic Regulator, mixed-sensitivity H-Infinity, Perturb & Observe, Incremental Conductance, etc…); Particle Swarm Optimisation, Recursive Least Square Estimation; Machine Learning; Power Electronics Converters; MPPT Control; Solar Renewable Energy System.

Software & Hardware Experience

- Matlab, Simulink and Simscape (7+ years of experience with Model-Based Designing, Software-in-the-Loop and Hardware-in-the-Loop Testing).
- Flight testing with a quadcopter UAV, Pixhawk 6C microcontroller and custom-built PX4 firmware.
- Texas Instrument C2000 (F28335) microcontroller (DSP) for power electronics control.
- Version Control using GitHub.
- Arduino, ESP-32, Raspberry Pi, etc.

Education

Research Centre: CSMM – Coventry University, UK   **September 2021 – Ongoing**
PhD (Fully Funded Scholarship)
Research: Enhancing the flight control algorithms for multirotor UAVs against motor faults and varying payload using a novel, robust and adaptive control strategy.

Asia Pacific University of Technology & Innovation, Malaysia   **February 2017 – March 2021**
BEng. (Hons) in Electrical & Electronics Engineering
CGPA: 3.99 (First Class, Best Student Award, Best Student Dissertation & Project Prize)

Cambridge GCE Advanced Level Examination   **June 2016**
Physics, Mathematics and Computer Science

Cambridge GCE Ordinary Level Examination   **June 2014**
Science Stream

Work Experience

Skyfarer Ltd – Rugby, UK   **July 2022 – Ongoing**
Systems Engineer & Data Analyst
- Responsible for Skyfarer system software development.
- Managing data analysis (flight data) with a focus on sustainability and cost-benefit analysis.
- Providing internal hardware, software and IT infrastructure support.

Coventry University, UK   **September 2021 – Ongoing**
Postgraduate Researcher
- Developing high-Fidelity mathematical model of a quadcopter UAV with uncertainties.
- Developing robust and adaptive fault-tolerant flight control algorithms for delivery quadcopters, ensuring stability under motor faults and varying payloads.

- Model-based designing, software-in-the-loop, hardware-in-the-loop and actual flight testing with a quadcopter UAV, Pixhawk 6C microcontroller and custom-built PX4 firmware.

Asia Pacific University of Technology & Innovation, Malaysia　　　　**February 2017 – March 2021**
Research & Development Engineer
- Conducted a feasibility analysis, focusing on the energy, space, and budget constraints for solar PV system installation to lower the electricity bill by harnessing solar energy on the rooftop of the university premises.

Publications & Projects

Robust Auto-Tuning Control of a Delivery Quadcopter with Motor Faults, Mass and Inertia Estimation:
- Presented my research at the Modeling, Estimation, and Control Conference 2024 – Chicago, United States.
- Research article published in the conference proceedings via IFAC-PapersOnLine, ScienceDirect.

Group Leader: Autonomous Drone for Power Line Inspection:
- Designed an autonomous drone for real-time power line inspection using image processing, GNSS-based mapping, and RF data transmission.
- Won 'Best Innovation Award' at InnoServe 2020.

Group Leader: IoT-based Ionizing Radiation Detector:
- Developed a sensitive, low-cost and portable radiation detector with IoT capabilities to detect for any harmful background radiation and alert users.
- Won MSC Malaysia APICTA 2019 and 'Best Innovation Award' at InnoServe 2019, Taiwan.

Undergraduate Dissertation: Smart AI System for Solar Power Extraction:
- Improved the efficiency of solar PV systems by up to 95% against partial shading conditions by integrating conventional maximum power point tracking with AI-based optimisation.
- Extensively tested and validated using Matlab and Simulink for real-world conditions and the results proved the accuracy of the system.

Minor Projects:
- Designing & Building Multi-Stage Amplifiers using BJT and MOSFET (Analog Electronics).
- Designing & Building Arithmetic Logic Unit using Discrete Components (Digital Electronics).
- VLSI Design - VHDL & Verilog.
- Circuit Designing & PCB Building.
- Designing Power Converters (DC-DC) using Matlab and Simulink.
- Hands on Experiments with Electrical Machines (Generators, Motors, Transformers & Alternators).
- 3D CAD drawing using SolidWorks and 3D printing.

Certifications, Achievements, Leadership & Volunteering Experience

- Engineering Technical Assistant at Asia Pacific University of Technology and Innovation
- Student Affiliate Member of the Institution of Mechanical Engineer (ID: 80394532)
- Registered Graduate Engineer under the Board of Engineers Malaysia.
- Silver Award at the Malaysia Technology Expo 2020
- Merit Award Winner at Engineering Innovation Challenge 2019, organized by the Institution of Engineers, Singapore
- Merit Award Winner at Junior Inventor of the Year Competition 2015, organized by the Institution of Engineers, Sri Lanka
- Technical Lead of IMechE APU Student Chapter 2019/2020
- Treasurer of Institution of Engineers Malaysia APU Student Section 2018/2019
- Director of Leo district 306 B2, Sri Lanka 2014/2015

Skills & Abilities

- Research and problem solving skills.
- Fast learner.
- Stress management
- Strong presentation and interpersonal skills.