Amierul Hakeem

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EDUCATION

University of Manchester
MEng (Hons) Mechatronics Engineering *Sep 2022 - Jul 2026*

- First year 3rd Best Overall Performance in the Year Group
- On track for First-Class Honours, 3rd year result: 81.7%

Malay College Kuala Kangsar
International Baccalaureate Diploma *Jul 2020 - May 2022*

- 43 out of 45 points, 7 out of 7 in all Higher-Level subjects (Physics, Maths AA, English B)

Malaysian Public Service Department (JPA)
Recipient of JPA International Study Scholarship *Jul 2020 - Jul 2026*

WORK EXPERIENCE

University of Manchester
Research Assistant *Aug 2025 - Sep 2025*

- Conducted research on an experimental 1kW, high-frequency, multi-module Zero Voltage Switching (ZVS) Quasi-Resonant (QR) flyback converter.
- Optimized the coil's magnetic design by performing experiments at various operating points, achieving a peak efficiency of 90%.

Summer Internship *Jun 2025 - Aug 2025*

- Redesigned and prototyped practical teaching circuits, performing simulations (LTspice) and PCB layout improvements (KiCad) to resolve design issues.
- Validated lab scripts and created supplementary learning materials to provide students with deeper insights into electronic design.

PROJECTS & TEAM EXPERIENCE

Manchester Stinger Motorsports (Formula Student Team)
Principal High Voltage (HV) Systems Engineer *Sep 2025 - Present*

- Advising on overall HV electrical system architecture and leading knowledge transfer and training sessions for new members.
- Overseeing the cross-team integration of all electronic systems to ensure compatibility with mechanical and powertrain components.

Software Team Lead *May 2024 - Sep 2025*

- Led a 7-person team in developing the full vehicle software stack, from the low-level embedded firmware (C) to the high-level software for data acquisition (Python).
- Spearheaded the complete hardware and firmware development for the team's first custom 470V Li-ion Battery Management System (BMS).
- Designed PCB (Altium Designer) incorporating the latest generation of BMS ICs from Analog Devices and developed custom low-level drivers for the new ICs.

Auxiliary Electronics Engineer *Oct 2023 - May 2024*

- Developed Brake System Plausibility Device (Kicad) comprising only non-programmable electronics, enhancing the knowledge of practical electronics.
- Acquired practical experience in developing a safety-critical device, working within strict requirements to ensure high reliability and prevent potential safety risks.

4th Year Team Project
3 kW Wide Voltage Output Lithium-ion EV Battery Charger *Sep 2025 - Present*

- Leading the development for the core 3kW DC-DC power stage within a 6-person project team.
- Designing, simulating, and prototyping a bespoke Phase-Shifted Full-Bridge converter to charge a high-voltage Li-ion battery pack (200V - 600V).
- Developing firmware on an STM32 microcontroller to implement robust Constant-Current and Constant-Voltage (CC/CV) charging, real-time data logging, and critical safety protections.

3rd Year Individual Project

Formula Student Vehicle Control Unit (VCU) Development *Sep 2024 - May 2025*

- Designed a custom VCU PCB (Altium Designer) based on an STM32 F4 microcontroller, ensuring full compliance with stringent Formula Student safety regulations.
- Developed low-level firmware in C using STM32 HAL libraries and implemented a Real-Time Operating System (FreeRTOS) for efficient multitasking and real-time control.
- Iteratively tested and debugged the design, culminating in the successful integration of the final VCU into the 2025 University of Manchester Formula Student EV.

2nd Year Embedded Systems Project

Autonomous Line Following Buggy *Oct 2023 - May 2024*

- Won the award of best embedded systems project by winning the final race against 50 other teams in the cohort and breaking last year's record time by over 10 seconds which was more than 20%.
- Developed (Mbed) C++ code using a state machine architecture with multiple external and timer interrupts which allows for a constant rapid 5 kHz update frequency for the digital 2-layer cascaded PID controller for precise movement control.
- Designed the buggy's CAD (SOLIDWORKS), optimising weight distribution to reduce rotational inertia allowing for precise 90-degree turns at the maximum speed of 2 m/s.

Robosoc (Robotics Society)

Hexapod Spyders Project *Oct 2023 - May 2024*

- Collaborated in a 5-person team to build a hexapod robot utilizing the Robot Operating System (ROS) for coordinated multi-robot movement.
- Programmed the robot's embedded firmware (Python) on a Raspberry Pi Pico for low-level control and hardware integration.
- Designed the chassis and mechanical components (SOLIDWORKS) and used a personal 3D printer to rapidly prototype and iterate on the design.

UK CanSat Competition

Power Electronics and CAD Lead *Oct 2022 - May 2023*

- Cooperated with a diverse team of 4 student engineers from different academic backgrounds to design and build a compact can-shaped satellite.
- Developed a cost-effective two-stage parachute and landing leg deployment system (SOLIDWORKS), optimising limited space and weight constraints by utilising a single servo motor, thereby creating additional room for incorporating extra electronics and sensors into the CanSat.
- Enhanced problem-solving and project management skills through a long-term, systematic project.

LEADERSHIP & VOLUNTEERING

Makerspace Society

Makerspace Technician *Jun 2024 - Present*

- Supervise and mentor new students, conducting hands-on weekly workshops on electronics and 3D printing to inspire a passion for making.

The University of Manchester

Peer Assisted Study Sessions (PASS) Leader *Jun 2023 - May 2024*

- Facilitated academic support for a group of 30 peers as a PASS Leader, facilitating engaging weekly workshops and fostering a collaborative learning environment.

Hackchester (Cybersecurity Society)

Student Developer *Oct 2022 - May 2023*

- Conducted weekly workshops with the goal of enhancing awareness and expertise in the field of cybersecurity and facilitated the development of the society's website.

TECHNICAL SKILLS

Programming: C/C++, Python (NumPy, Matplotlib), ROS, Linux
Embedded Systems: STM32 HAL, Mbed, FreeRTOS
Design & Simulation: Altium Designer, KiCad, SOLIDWORKS, MATLAB, Simulink, LTspice
Hardware & Lab Skills: PCB Prototyping, Micro Soldering, Oscilloscopes, Logic Analyzer, Power Supplies, Multimeters, 3D Printing
Certifications: Harvard University CS50x / CS50p / CS50ai