Charles Lin

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EDUCATION

The University of Manchester 2023 – 2026

Bachelor of Engineering in Electrical and Electronic Engineering *Avg: 90.5% (First Class)*

EXPERIENCE

UoM School of Engineering x School of Environment June 2025 – May 2026

Hardware Designer, Internship *Manchester, UK*

- Designed a custom mixed-signal PCB (Altium) for an NDIR methane sensor with partitioned power domains and controlled return currents.
- Wrote Arduino firmware for a timer-driven lamp and interrupt-based peak-to-peak sampling of sensor channels, handling detector delay and channel-switch timing; integrated CO_2, pressure, and RTC data into unified timestamped logging.
- Built a Python (Pandas/SciPy) pipeline to synchronize and process sensor datapoints, automating nonlinear curve-fitting to extract calibration coefficients and systematically tuning the concentration cutoff to optimize fit quality.
- Calibrated the £300 sensing platform against a £59k commercial gas analyzer to evaluate its viability as a low-cost alternative; characterized performance and identified higher-concentration applications as the viable use case.

Manchester Stinger Motorsports Sep 2023 – Present

Head of Electronics *Manchester, UK*

- Designed a robust safety reset circuit that allows the shutdown circuit to open or reset based on IMD and BMS conditions.
- Developed the Tractive System Active Light, enabling LEDs to display safety status according to accumulator relays, pre-charge circuitry, and HV presence with non-programmable hardware logic and circuitry.
- Optimized the Brake System Plausibility Device PCB with a 10-second auto-reset circuit, reducing fault recovery time.
- Participated in the 2025 FSUK competition, first EV entry in history.
- Assisted in recruitment by organizing group assessments and serving as a judge during candidate evaluation.

Embedded Systems Project Sep 2024 – June 2025

Project Leader, coursework competition *Manchester, UK*

- Led a team of 5 to design a high-speed line-following robot using the STM32 microcontroller with C++.
- Characterized motors and sensors through laboratory experiments to determine optimal component selection.
- Developed an algorithm integrating two PID controllers for line following and for motor speed control on slopes.
- Designed the robot chassis in SolidWorks with structural stress analysis and component placement optimization.
- Achieved 6th place out of 50 teams in the university final race competition.

PROJECTS AND ACTIVITIES

Cache Controller Simulation April 2025

- Built a direct-mapped cache simulator in C modelling write-back and write-through policies, decoding addresses into tag/index/block fields and reporting hit/miss and memory-traffic statistics from CPU trace files.

Tic-Tac-Toe hardware June 2024

- Designed and built a bare-metal ATmega328P tic-tac-toe PCB (KiCad, embedded C) with minimum-system hardware and a minimax AI opponent, programmed via AVR-GCC without Arduino libraries.

Peer-Assisted Study Sessions (PASS) Leader Sep 2024 – June 2025

- Support first-year engineering students through weekly interactive study sessions.
- Facilitate group discussions, explain difficult concepts, and provide academic mentorship.

Math Tutor June 2024 – Aug 2024

- Delivered one-on-one tutoring sessions in high school mathematics.
- Developed customized lesson plans and practice problems tailored to student needs.

ACHIEVEMENTS

University of Manchester *Manchester, UK*

- 1st Prize for Best Overall Performance in the Year Group based on GPA (2024).
- 2nd Prize for Best Overall Performance in the Year Group based on GPA (2025).
- 1st Prize for Best Overall Performance in the Year group based on GPA (2026)

RELEVANT COURSEWORK

Software: C Programming, Data Networking, Concurrent Systems

Hardware: Power Electronics, High Speed Digital & Mixed Signal Design, Computer Systems Architecture, Control Systems, Sensors & Instrumentation, Electrical Drive Systems, Microcontroller Engineering, Digital System Design, Signals and Systems, Electronic Circuit Design, Analogue and Digital Communication, Embedded Systems project, Electromagnetic Fields, Circuit Analysis, Electronic Materials, Measurements & Analytical Software, Energy Transport and Conversion