MAIRAJ Muhammad

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PROFESSIONAL SUMMARY

Highly motivated and proactive Electrical Engineering student at PolyU with a focus on Systems and Control (big fan of Brian Douglas). Possess hands-on experience in MATLAB, Python, System Design and Control, Electrical Machinery, Signal Processing, Telecommunication, and Digital and Analog Electronics through internships and academic projects.

EDUCATION

The Hong Kong Polytechnic University (PolyU) Aug 2023 - May 2027 (Expected)

- Bachelor of Engineering (Honors) in Electrical Engineering CGPA: 3.61

Relevant Coursework:
Circuits Analysis (A+), Electronics (A), Python Programming (A-), Electrical Energy Systems (A-), Applied Electromagnetics (A), Analog and Digital Circuits (A+), Electric Machinery (A+), Systems and Control (A), Computer Systems (A), Linear Systems and Signal Processing (A+)

Independent Learning:
Harvard's CS50 Understanding Technology
Harvard's CS50 Introduction to Computer Science and Programming
IBM's certification for Hardware and OS support

Current Coursework:
Applied Digital Control, Power Distribution and Transmission, Electrical Services in Buildings, Industrial Computer Applications, Power Electronics and Drives

Overseas Learning:

- **Mathematics and AI at Cambridge University** Summer 2025
  Linear Algebra, Data Analysis, AI Algorithms, Python Programming
- **Engineering Entrepreneurship at NU Singapore** Summer 2025
  Engineering Entrepreneurship, Problem Solving, Communication, Pitching

WORK EXPERIENCE

Electrical Engineering Trainee at PolyU Industrial Centre May 2025-June 2025

- Completed a rigorous, hands-on training program covering low-voltage electrical systems, building automation, control systems, and PLC programming across four specialized modules at the Industrial Centre of PolyU.
- Designed and installed electrical systems including lighting layouts, ring circuits, and distribution boards in compliance with Hong Kong EMSD standards and safety regulations.
- Built and commissioned a low-voltage main switchboard, performing functional tests such as polarity, ratio, insulation resistance (Megger), Ductor, and primary/secondary injection tests.
- Programmed and integrated control systems using KNX for building automation and IQSET for controller strategy design, with hands-on practice in PLC-controlled electro-pneumatic systems.
- Applied electrical installation skills including conduit wiring, two-way lighting circuits, soldering, de-soldering, and PCB fabrication in a workshop environment.
- Adhered to strict safety protocols, including PPE compliance, equipment grounding, and hazard prevention throughout all practical sessions.
- Collaborated in team-based projects to simulate real-world electrical design, installation, and testing scenarios, enhancing technical communication and problem-solving skills.

Mathematics and English Instructor at Kumon Sep 2025-Dec 2025

- Assisted in teaching Mathematics and English to students from diverse academic backgrounds, including IB, A-Level, and HKDSE systems. Supported individualized learning through guided instruction and progress monitoring. Additionally handled administrative tasks such as student record management, worksheet organization, and center operations support.

Software and Design Intern at HYR July 2025-Aug 2025

- Revamped the UI/UX of their staffing solution app connecting 50% more workers with restaurants, bars, and clubs, using Figma to redesign workflows that improved shift-booking efficiency and boosted workers and businesses sign-up conversion by 25%.
- Strengthened scalability and user adoption by streamlining onboarding flows for both workers and businesses, reducing user complaints by 30% and driving higher engagement with posted shifts.

Data Analyst Intern at Gryfyn Mar 2025-Apr 2025

- Delivered seamless user experiences for Mootiez, a niche social media platform catering to K-pop and anime

enthusiasts, by conducting rigorous QA testing and deploying new features to enhance functionality and user engagement.
- Pioneered user-centric improvements by analyzing feedback from 500+ users, identifying pain points in key features (e.g., content discovery, community groups), and collaborating with cross-functional teams to prioritize high-impact fixes.
- Built a scalable analytics dashboard using Flask to aggregate multi-platform user behavior data, empowering developers to focus on critical areas (e.g., retention metrics, feature adoption) and accelerating roadmap decisions by 20%.

Software Engineer Intern at Century Innovation Labs July 2024-Aug 2024
- Build a prompt-based chatbot using OpenAI's API to assist students in mastering nuanced aspects of Chinese writing styles, grammar, and literary techniques.
- Architected the frontend with React.js and the backend with Python, ensuring intuitive user experiences and robust data processing.
- Developed a Flutter mobile app enabling users to scan and upload handwritten essays, which were automatically analyzed by the chatbots to provide real-time, structured feedback.
- Empowered more than 1500 students to improve their language proficiency and literary analysis skills through interactive, tech-enhanced learning tools.

PROJECTS

Analog Line-Following Robot *Personal Project*
- Designed and built an autonomous line-following vehicle using purely analog electronics without any microcontroller or digital programming.
- Implemented a closed-loop feedback control system with two LDR-LED sensor pairs, an LM393 comparator, and PNP transistor motor drivers.
- Programmed bang-bang (on/off) steering logic to keep the car on a black track by independently controlling left and right DC motors.
- Troubleshot sensor alignment, power stability, and soldering reliability to achieve consistent autonomous tracking in varied lighting conditions.
- Lead a 5-person team on assembly, testing, debugging, and documentation of the complete electromechanical system.

PolyU GUR Course Reviews Platform *Personal Project*
- A full-stack web platform developed with Flask, SQLite, and Bootstrap 5, designed to help PolyU students discover, review, and rate General University Requirement (GUR) courses. The platform provides students with advanced search and filtering tools, authentic course and teacher reviews, grade analytics, and personalized dashboards — enabling them to make informed decisions about their course selections and GPA outcomes without relying solely on peer-to-peer advice.

3-Phase Brushless Permanent Magnet Generator (PMG) Role: *Arduino Programmer* in a team of 6
- Collaborated in a team of six to design and build a brushless Permanent Magnet Generator (PMG) for an academic engineering project.
- Designed stator and rotor components, including layout of six copper-wire coils and magnet mounting pattern to maximize electromagnetic power generation.
- Developed Arduino-based measurement system using an INA219 sensor and LCD1602A display for real-time monitoring of generator output.
- Co-designed and implemented a three-phase AC to DC rectifier circuit to drive an LED indicator demonstrating generator functionality.
- Strengthened problem-solving, teamwork, and project-planning skills by optimizing generator efficiency and meeting structured project milestones within defined deadlines.

PolyU Industrial Centre Lighting Design *Engineering Drawing Module Project*
- Designed a lighting system for the PolyU Industrial Centre with calculations of lighting loads, distribution patterns, and compliance with industry standards. My design aimed to provide consistent illumination while reducing power usage, which improved both safety and energy efficiency within the facility.

EV Car Park MEP Design *Engineering Drawing Module Project*
- Designed an MEP layout for an electric vehicle car park using AutoCAD. I focused on planning the electrical distribution system, ventilation, and safety features while applying building services engineering principles to improve energy efficiency. The final design emphasized scalability and practical implementation, giving me hands-on experience in real-world electrical and mechanical planning.

SKILLS

Equipment: Signal Generator, Oscilloscope, DC Supply, Digital Multimeter, Soldering & Breadboard circuits
Electronics: BJTs, MOSFETs, Op-Amps, Frequency Analysis, Arduino, Raspberry Pi, INA219 Sensor
Programming: Python, C/C++, R, MATLAB, Version Control (Git), JavaScript

Software Tools: AutoCAD, SolidWorks, VS Code, PSpice, Simulink, Jupyter Notebook, Microsoft Office
Soft Skills: Problem Solving, Teamwork, Effective Communication, Attention to Detail, Leadership
Languages: English (Native), Urdu (Native)

AWARDS & ACHIEVEMENTS

- Awarded with PolyU full ride Entry Scholarship for exceptional academic performance
- Member of PolyU EEE's Head's List for overall excellence
- Earned Gold Medal and Government Scholarship for securing 94% marks in HSSC Examinations
- Received Duke of Edinburgh's International Bronze Award for 200+ hours of community service

EXTRA-CURRICULARS

- **Engineering and Entrepreneurship Society:** Arduino programmer for underwater robotics team
- **Technical Lead at Google Developers Group:** Taught coding to 60+ university students
- **Volunteer Services:** Served as an Internal Vice President of PolyU Hall Community Service Group