

MAIRAJ Muhammad

Tel: +852 5665 5018 | [Email](#) | [LinkedIn](#) | [Portfolio](#)

PROFESSIONAL SUMMARY

EE student at PolyU with strong interests in power systems, control engineering, and energy infrastructure. Experienced in transmission system simulation, fault analysis, low-voltage switchboard commissioning, and building services design. Combines hands-on electrical training with programming skills in Python and MATLAB to solve real-world engineering problems. Proactive learner with leadership experience and a strong commitment to technical excellence and industry impact.

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**
Linear Algebra, Data Analysis, AI Algorithms, Python Programming
- Engineering Entrepreneurship at NU Singapore**
Engineering Entrepreneurship, Problem Solving, Communication, Pitching

Summer 2025

Summer 2025

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, desoldering, 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.
- Troubleshoot 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.

Job Tracker Platform

Personal Project

- Built a full-stack web application using Flask and SQLite to manage and track job applications, statuses, deadlines, and application details in a centralized platform.
- Implemented search, filtering, and status tracking features with a responsive Bootstrap-based UI and interactive JavaScript components.
- Developed a statistics dashboard to visualize application trends and status distributions for data-driven job search insights.

CS50 Finance (Stock Portfolio Management System)

Personal Project

- Developed a secure web-based stock trading simulator with user authentication, real-time stock quotes, and virtual portfolio management.
- Implemented buy/sell workflows, transaction history tracking, and real-time portfolio valuation using external stock price APIs.
- Designed and managed a relational SQLite database with secure session handling and input validation.

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 the 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 an 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.

Power System Fault Analysis & Transmission Network Simulation

Lab Project

- Modelled a 19-bus, 132 kV interconnected power system in **PowerWorld Simulator**, performing load flow and three-phase short-circuit fault analysis on a 100 MVA base.
- Analyzed contingency scenarios including load increase, generator capacity expansion, and additional parallel tie-lines to evaluate impacts on **fault levels, power flows, and system stability**.
- Interpreted short-circuit currents and generator infeeds to assess network robustness and protection considerations under varying operating conditions.

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

Power & Energy Systems: Power transmission and distribution, Load flow analysis, Short-circuit and fault analysis, Low-voltage switchboards, Distribution boards, Synchronous machines, Induction machines, DC machines, Power electronics

Control Systems & Signal Processing: Linear systems, Feedback control systems, Applied digital control, System modelling, MATLAB, Simulink, Frequency analysis, Signal processing, Closed-loop system design

Electronics & Embedded Systems: Analog circuit design, Digital circuit design, BJTs, MOSFETs, Operational amplifiers, Arduino, Raspberry Pi, PLC systems, Electropneumatic systems, PCB prototyping, Soldering, Oscilloscope, Signal generator

Programming & Software Development: Python, C/C++, MATLAB Apps, JavaScript, React.js, Tailwind CSS, Flask, Django, Git, SQL

Engineering & Design Software: PowerWorld Simulator, AutoCAD, SolidWorks, PSpice, Simulink, KNX building automation, VS Code, Jupyter Notebook, Microsoft Office

Professional Skills: Technical documentation, Analytical problem-solving, Project execution, Cross-functional collaboration, Leadership, Public speaking, Time management, Adaptability, Attention to detail

Languages: English (Native), Urdu (Native), Mandarin (Beginner)

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
- **Member of HK Society of Computer Science:** Took part in 10+ workshops and multiple official gatherings.