



Muhammad Zafir

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EDUCATION

NUST-National University of Sciences and Technology

BE Electrical Engineering (4TH Semester)

Aga Khan College Karachi

Higher Secondary School Certification

(Physics, Mathematics, Computer Science)

BVS Parsi High School Karachi

Secondary School Certification

(Physics, Mathematics, Computer Science)

PROJECTS

- **Generative AI Research Assistant (Python, LangChain, Vertex AI)** – Built a domain-specific assistant using LLMs, embeddings, vector stores, and prompt engineering for intelligent query answering with agent-based planning and memory.
- **Brain Tumor Segmentation (YOLOv8, SAM, OpenCV)** – Developed a hybrid deep learning pipeline combining YOLO for tumor detection and SAM for precise segmentation on MRI scans.
- **Library Management System (Python, Data Structures)** – Efficient book cataloging using BSTs and linked lists.
- **Line Following Robot (Embedded Systems, Motor Control)** – Autonomous IR-sensor robot with PD control.
- **Voltage Measurement Instrument (Embedded Systems, Circuit Design)** – Real-time voltage monitoring system.
- **Auto-rotating solar panel (Embedded systems, control systems)** – Motorized tracking system that optimizes energy absorption.
- **Biometric Unlocking System (Embedded Systems, Digital Logic)** – Fingerprint-based security with PCB design.

VOLUNTEERING & LEADERSHIP

- **Ramzan Drive** – Distributed food to 200+ families.
- **Beach Cleanup Project** – Led team collecting 100+ kg of waste.
- **Tree Plantation Project** – Planted and maintained 50+ saplings.
- **Blood Donation Drive** – Organized event, collecting 100+ donations.
- **Deputy Head Boy, BVS Parsi High School** – Led student council and organized events.
- **President, Debating Society, Aga Khan College** – Organized debates, grew membership by 30%.
- **Secretary General, MCSMUN** – Oversaw large-scale MUN conference.
- **Director of Marketing, BVSMUN** – Attracted 200+ participants.

SKILLS

- **Programming:** Java, C++, Python, C/C++
- **Web Development:** HTML, CSS, JavaScript
- **Embedded Systems:** Arduino, Microcontrollers, ModelSim, Keil, VS4000, Embedded Circuit Design
- **Software Tools:** AutoCAD, Proteus, EasyEDA, Multisim, Git/GitHub, Jupyter Notebook, SQL
- **Hardware Design:** PCB Design, Circuit Simulation
- **Data Science & AI/ML:** Pandas, NumPy, Scikit-learn, TensorFlow, OpenCV, LangChain, Prompt Engineering, RAG, Embeddings, Vector Databases, YOLOv8, SAM (Segment Anything Model), Vertex AI

INTERESTS

Public Speaking | Media & Production | Graphic Designing | Editing | Photography | Sports

RESEARCH AND PUBLICATION

Enhancing Secrecy Capacity Using Reconfigurable Intelligent Surfaces in Line-of-Sight (LOS) Scenarios for Beyond 5G Networks - IJRASET (February 2025)