

Muhammad Ahmed Rayyan

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EDUCATION

Bachelor of Science Artificial Intelligence

Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST), Karachi

Sept 2023 - Present

GPA: 3.33 / 4.0

Relevant Coursework: Artificial Intelligence, Machine Learning, Artificial Neural Networks, Natural Language Processing, Computer Vision, Data Structures & Algorithms, Database Systems, Software Engineering, Agent-Based Modeling

Intermediate (Pre-Engineering)

Govt. Degree Science & Commerce College, Gulshan-e-Iqbal Block-7, Karachi

Jul 2021 - Jul 2023

TECHNICAL SKILLS

Programming & Web: Python, C/C++, Java, JavaScript, HTML5/CSS3, React, FastAPI, Flask, Streamlit, Gradio, NodeJS

Machine Learning & AI: PyTorch, TensorFlow, scikit-learn, XGBoost, Hugging Face Transformers, LangChain, LangGraph, NLTK, nnU-Net, OpenCV, ChromaDB, MCP

Tools & Platforms: Git/GitHub, DVC, MLflow, MySQL, PostgreSQL, Microsoft SQL Server, n8n, SHAP, Arduino IDE, Raspberry Pi, NetLogo, Vercel/Netlify, Render/Railway

WORK EXPERIENCE

Alphatron Technologies

AI Research Intern | Python, LangGraph, MLOps, Multi-Agent Systems

Karachi, Pakistan

Jul 2026 – Sept 2026

- Built a multi-agent resume analysis system with LangGraph and deployed it to Streamlit Cloud.
- Researched a multi-agent incident response and on-call triage system case study, applying game theory to agent coordination.
- Developed and revised a production-grade data science pipeline for electricity generation analysis based on supervisor feedback.

Aga Khan University Hospital (AKUH)

AI/ML Intern | Python, PyTorch, nnU-Net, NumPy, Pandas

Karachi, Pakistan

Jul 2025 – Aug 2025

- Implemented nnU-Net for pediatric MRI segmentation (LISA Challenge), achieving mean Dice of 0.68 and IoU of 0.52.
- Conducted research on MRI super-resolution and deep learning segmentation techniques for medical imaging applications.
- Evaluated model outputs through quality control and explored emerging architectures such as MAMBA-based segmentation models.

PROJECTS

PolicyOps | Python, XGBoost, DVC, MLflow, FastAPI, React | [Github](#)

- Built an insurance fraud detection MLOps pipeline using DVC and MLflow for data versioning and experiment tracking.
- Trained an XGBoost model achieving F1-score of 0.8355 and ROC-AUC of 0.9239, with SHAP-based explainability.
- Developed a FastAPI backend and React dashboard to serve predictions and explainability insights in a production-style interface.

ThesisLens | Python, LangGraph, Groq, FastAPI, React, D3.js | [Github](#)

- Built an autonomous research agent that ingests papers via the ArXiv API, identifies gaps, and generates State-of-the-Field reports.
- Orchestrated multi-step agent reasoning with LangGraph and Groq-hosted LLMs, exposed through a FastAPI backend.
- Designed a React + D3.js force-directed knowledge graph frontend to visualize paper relationships & research clusters interactively.

MediQuery-RAG | Python, Streamlit, LangChain, ChromaDB | [Github](#)

- Built a RAG pipeline (984 chunks, 8 FDA labels) with Groq's Llama 3.1 8B, delivering citation-backed, zero-hallucination responses.
- Evaluated via LLM-as-judge across 20 queries, achieving Faithfulness 0.82 and Answer Relevancy 0.78 (RAGAS-equivalent).
- Engineered a rephrase-then-retrieve chain with conversational memory to resolve multi-turn follow-up queries accurately.

ACHIEVEMENTS & ACTIVITIES

2nd Place – National AI Hackathon '26 (Karachi Regional)

atomcamp | May 2026

Built EduFlow, a 9-agent AI platform using LangGraph, targeting Pakistan's education crisis covering automated grading, multilingual feedback, parent engagement, intervention planning, and ghost school detection, competing against ~60 teams (~176 participants).

First Prize – Machine Learning Competition

ZABEFEST, SZABIST | 2025

Developed an XGBoost-based pipeline to predict liver cirrhosis patient survival outcomes (Mayo Clinic dataset, 17 clinical features) using multi-class classification. Achieved a log-loss of 0.3557, securing 1st place on the competition leaderboard.

3rd Prize – AI Image Generation Competition (World No Tobacco Day)

Community Health Sciences Department, Aga Khan University | 2025

Created AI-generated public health awareness imagery discouraging tobacco usage, demonstrating creative application of AI for social impact and awareness. [Virtual Gallery](#)

Member – Tobacco Free Cities Coalition Initiative

Community Health Sciences Department, Aga Khan University | 2024 - Present

Contributed to public health awareness initiatives promoting tobacco-free environments through collaborative activities.