Farhan Ali Khan

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Education

COMSATS University Islamabad, Lahore Campus
Bachelor of Science in Computer Engineering (CGPA: 3.74) — *Sept. 2021 – July. 2025*

Government College University Lahore (GCU)
Intermediate in Computer Science (ICS) — *Aug. 2019 – June 2021*

Experience

Internship - Engineering Department — June 2024 – August 2024
Flood Forecasting Division (FFD), Pakistan Meteorological Department (PMD) — *Lahore, Pakistan*

- Gained hands-on experience with Geographic Information Systems (GIS) and explored the use of satellite imagery with machine learning models for weather pattern predictions.
- Learned about remote weather sensors built with microcontrollers and observed the real-time data transmission process from nationwide stations to the central server.
- Processed METAR reports to be fed into the computational system to forecast the weather conditions.

Projects

OptiPros(*Final Year Project*) | *LLM/SLM, VLM, NLP, CV*

- Designed a headset-styled lightweight assistive device powered by locally running latest AI models to help visually impaired people to navigate the environment.
- Utilized Raspberry Pi 4 with 8GB RAM and Pi Camera module for on-device computation and localized processing.
- Optimized open source LLMs/SLMs and VLMs for accurate and quick inferences, locally on the device.
- Engineered a lightweight Vision-Language Model (VLM) architecture in PyTorch, optimized for real-time, low-latency inference on edge devices without compromising accuracy.

Hardware Accelerated KNN on FPGA | *FPGA, VHDL, ML*

- Implemented K-NN algorithm on FPGA using Verilog Hardware Description Language (VHDL) based on the research paper **(Link)** utilizing raw hardware power for binary classification.
- Developed optimized hardware architecture for K-NN algorithm using RTL (Register Transfer Learning) design.
- Achieved inference time of approximately 360 nanoseconds on Altera FPGA.
- Check out my blog for more details. **(Blog Link)**

MCQ Generator from scratch | *Python, NLP*

- Repo Link: **github.com/ThisIsFarhan/MCQGENERATOR-NLP**
- Live Link: **mcqgenerator-nlp-farhan.streamlit.app/**
- Implemented an MCQ generation algorithm from scratch using NLP techniques, based on research paper **(Link)**, to automatically generate multiple-choice questions and answers from input text.
- Utilized Spacy library for stemming, lemmatization and stopwords-removal for text preprocessing.
- Implemented TF-IDF using sckikit-learn for extracting the important keywords from the text.

LeafyLenz | *Flutter, Firebase, Tflite*

- Repo Link: **github.com/ThisIsFarhan/LeafyLenz-Flutter**
- A Flutter-based mobile application to scan plants using image classification model running locally by Tflite and trained using **Google Teachable Machines** and generate care guides using Google's **Gemini 1.5 Flash**.
- Implemented Firebase backend services including user authentication, real-time database management, and cloud storage integration.
- Integrated Google AdMob reward-based advertising system for app monetization and enhanced user engagement .

Skills

Languages: Python, Javascript
Libraries / Frameworks: PyTorch, LangChain, LangGraph, FastAPI, ReactJs
LLM: RAG, Fine-Tuning (PEFT), Quantization (llama.cpp)
Cloud & DevOps: AWS, Azure, Git, GitHub, Docker