

# Muhammad Hammad Khan

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## EDUCATION

### Institute of Business Administration, Karachi - BSc. in Computer Science

2022 – 2026

- Academics and Awards: CGPA 3.76, Dean's list
- Relevant Coursework: Introduction to Machine Learning, Introduction to Text Analytics, Software Engineering, Database Systems, Business Intelligence, Big Data Analytics, MLOps, Statistical Inference.

## WORK EXPERIENCE

### Pakistan State Oil

Karachi, Pakistan

#### Procurement Department - Intern

July 2025 – Aug 2025

- Engineered a full-stack vendor library web application (React, Tailwind CSS, Node.js, Express.js) to centralize and manage data for 21,000+ vendors.
- Automated digitization of 1,000+ vendor records using OCR pipelines with Tesseract, pdfplumber, LayoutParser, PubLayNet, EAST model, OpenCV, and Pandas for accurate table extraction.
- Enhanced procurement operations by increasing vendor participation and supplier diversity, improving transparency and efficiency in the pre-tender stage.

### Alpha Education Network — Alpha College

Karachi, Pakistan

#### Associate Teacher, Physics

Oct 2021 – June 2022

- Conducted 20-30 tutorial sessions every week on Physics for AS and A2-Level students.
- Graded examination scripts for over 500 students and provided feedback and academic counselling.
- Mentored 1500+ students, providing academic guidance and problem-solving techniques.

## PROJECTS & REPORTS

### Bicep Rep Curl Counter using Convolutional Neural Networks

- Designed and implemented a real time bicep rep curl counter by building a convolutional neural network from scratch, achieving 61% accuracy.
- Developed an optimized model using TensorFlow, improving accuracy to 74%.
- Created a custom dataset of 4,000+ images using OpenCV for training and testing, ensuring diverse angles and lighting conditions for robustness.

### AI-Powered ECG Monitoring & Federated Learning System

- Built a real-time ECG anomaly detection pipeline FastAPI, Docker, MLflow, and Prometheus/Grafana, with full MLOps automation, CI/CD, and monitoring.
- Implemented a complete RAG-based LLMOps workflow with FAISS retrieval, prompt engineering strategies, evaluation pipelines, cloud integration, and safety guardrails.
- Delivered a scalable, privacy-preserving system combining federated learning and LLM reasoning for early ECG abnormality detection and improved clinical support.

### Car Rental Management System

- Built a full-stack Car Rental Management System with Next.js, TypeScript, and MySQL, capable of handling over 1,000 transactions per day, with real-time booking, JWT-based authentication, and role-specific access controls.
- Optimized SQL queries and used multiple triggers for faster retrieval and booking transactions, reducing response time by 30%.
- Designed the Entity-Relationship Diagram (ERD) and developed a relational database using SQL. Implemented specific constraints, including foreign keys, unique constraints, and checks, to ensure data integrity and consistency.

### Housing Price Prediction

- Performed EDA and feature engineering on a 272-feature Russian housing dataset for price prediction.
- Implemented & optimized multiple regression models (Linear Regression, Ridge, Lasso, Random Forest, Gradient Boosting, XGBoost) with hyperparameter tuning and evaluation across metrics, achieving over 94% accuracy.
- Ranked 19th out of 110 participants in a competitive ML challenge.

## SOCIAL WORK & EXTRACURRICULAR ACTIVITIES

### IBA convocation — Head Volunteer, Frontline Crew

Dec, 2024

- Managed a team of 60 volunteers to coordinate logistics and hospitality for 3,000+ guests.
- Coordinated the distribution of 1000+ souvenirs to the graduating batch, ensuring a smooth and organized process.

### IBA Arts And Photography Society — Core Team, Scavenger Hunt Module

Jan, 2024

- Designed puzzles for the 3-day scavenger hunt event with 1,200 participants, leveraging automated tracking systems.
- Won the award for best module in an event comprising of 22 modules.

### Regular Football/Futsal Player

- Played for multiple teams across Karachi including Ittehad FC, RBKarachi, Black FC.
- Competed in regional tournaments and club matches, demonstrating leadership and teamwork.

## SKILLS

- JAVA • Python • PyTorch • Docker • Github Actions (CI/CD) • MLflow • FAISS • AWS