MOAZZAM UMER GONDAL

Website • LinkedIn • GitHub • Email • +92-300-1600028

ACHIEVEMENTS & HONORS

- Research: First-author paper submitted (Sept 2025) and another in preparation (expected Oct 2025).
- Dean's List recognition for academic excellence – Spring 2023, 2024, and 2025.
- 7.5 Bands in IELTS (CEFR C1), demonstrating high English language proficiency.
- Awarded Aspire College Merit Scholarship with full funding for Intermediate studies.
- 2× Exceptional Volunteer Award – Deputy Head, SOFTEC (Pakistan's largest IT event).
- Participated in international hackathons (Google, Kaggle, NASA) focused on AI and global exposure.

EDUCATION

FAST National University of Computer and Emerging Sciences — Lahore, Pakistan
Bachelor of Science in Data Science — Sept 2021 – May 2025

- **CGPA**: 3.37/4.00 | **Final 2 Years**: 3.5/4.0 | **Rank**: Top 10% | **25 A's, 22 B's**
- **FYP**: Landscape Art Studio – An AI-driven application enabling artists to edit and enhance landscapes through mask processing, image generation, and intuitive customization tools.

Relevant Coursework: Introduction to Data Science, Big Data Analytics, Advanced Statistics, Data Warehousing and Business Intellligence, Artificial Intelligence, Natural Language Processing, Data Mining, Generative AI

PUBLICATIONS & MANUSCRIPTS

- **M. U. Gondal**, H. U. Qudous, and A. A. Farhan, "Beyond the Hype: Comparing Lightweight and Deep Learning Models for Air Quality Forecasting," submitted to *Signal, Image and Video Processing (Springer)*, Sept 2025.
- **M. U. Gondal**, D. Siddiqui, H. U. Qudous, and A. A. Farhan, "From Pixels to Posts: Smart Image Segmentation for Captions and Hashtags," manuscript in preparation, 2025.

RESEARCH EXPERIENCE

Department of AI and Data Science, FAST NUCES — Lahore, Pakistan
Research Assistant | Supervisor: Dr. Asma Ahmad Farhan — Oct 2024 – Present

- Conducted multivariate forecasting experiments for $PM_{2.5}$ and PM_{10} using NeuralProphet, LightGBM, and Facebook Prophet, achieving $R^2 > 0.94$ and MAE < 5 on Beijing air quality data.
- Designed a multimodal pipeline integrating YOLO and vision-language models (CLIP, LLaMA) for fashion-specific captioning and hashtag generation; custom dataset includes 2,000+ annotated images.
- Experimenting with federated learning frameworks for cross-silo modeling on multivariate sensor data, targeting air quality forecasting and human activity recognition while addressing data heterogeneity and privacy.
- Collaborating on manuscripts for international journal submissions; contributing to experimentation, evaluation, and writing.

TEACHING EXPERIENCE

FAST National University of Computer and Emerging Sciences — Lahore, Pakistan
Teaching Assistant — Feb 2023 – Dec 2023

- Assisted in teaching and mentoring 40+ students in **Introduction to Data Science** to enhance their understanding of Python, data wrangling, and analysis concepts.
- Supported 30+ students in **Fundamentals of Big Data Analytics**, guiding them through Hadoop and Spark assignments, leading review sessions, and improving overall student performance.
- Assessed assignments and quizzes and provided feedback to boost students' competitive and analytical abilities.

INDUSTRY EXPERIENCE

Catalic AI Lahore, Pakistan
AI Engineer | Lead: Asjad Zaheer | Experience Letter May 2024 – April 2025

- Developed AI-driven applications integrating RESTful APIs to enable real-time data processing for scalable platforms.
- Optimized AI model deployment on AWS and GCP, increasing system efficiency in cloud environments.
- Fine-tuned large language models (LLMs) to enhance task-specific performance in enterprise-level automation systems.
- Contributed to R&D on advanced AI and LLM architectures while authoring technical documentation to communicate model innovations and deployment strategies to stakeholders.

PROJECTS

Improving Image Captioning on Asian Cultural Dresses (Research) [GitHub]
Tools: Python, PyTorch, BLIP, HuggingFace Transformers, CLIP, Jupyter

- Fine-tuned the BLIP vision-language model on a custom dataset of Asian cultural apparel, achieving a BLEU score of 0.218 and METEOR of 0.60 through few-shot learning and transfer learning.
- Addressed bias and improved generalization in culturally specific image captioning using targeted data augmentation, with strong ROUGE-L performance (F1: 0.418) validating semantic relevance.

Transformer-based Medical QA System (MedQuAD Dataset) [GitHub]
Tools: Python, PyTorch, HuggingFace Transformers, BERT, MobileBERT, RoBERTa

- Developed a question-answering system using the MedQuAD dataset, fine-tuning transformer models (BERT, MobileBERT, RoBERTa) with rigorous preprocessing and dropout regularization.
- Achieved highest performance with MobileBERT (BLEU: 0.622), demonstrating robustness in medical domain QA through smoothing techniques and comparative evaluation.

EngageAI – A Visual and Conversational AI Experience [GitHub]
Tools: Python, OpenCV, PyTorch, HuggingFace Transformers, YOLOv5, SpeechRecognition, FastAPI, WebSockets, AWS

- Designed and integrated a multimodal AI system combining object detection, speech-to-text, and language generation to enable real-time visual and conversational interaction.
- Implemented a unified pipeline for vision and NLP tasks, demonstrating robust system-level integration and enhancing real-time human-AI engagement through multimodal processing.

Secure AI and Deepfake Detection [Github]
Tools: Python, TensorFlow, Keras, OpenCV, CNN, VGG-19, NumPy, Scikit-learn

- Developed a deepfake detection pipeline using CNN, MLP, and VGG-19 architectures, achieving 80%+ classification accuracy on a 10k-image dataset of real and manipulated faces.
- Explored challenges in generalization and model robustness for image forensics, emphasizing secure AI applications in media authentication and digital trust.

PhotoMentor Chatbot [GitHub]
Tools: Python, OpenAI GPT, ChromaDB, RAG architecture, AWS Deployment

- Built a RAG chatbot leveraging ChromaDB and OpenAI models to deliver context-aware responses to photography-related queries.
- Engineered a pipeline combining dense embeddings and semantic search with generative models, enabling accurate and intelligent dialogue grounded in a curated photography dataset.

INTERNATIONAL HACKATHONS

NASA Space Apps Challenge 2025 Sept 2025
Project: **ExoFinder** | Certificate
Tools: Python, Scikit-learn, XGBoost, LightGBM, Streamlit, Pandas, NumPy, Seaborn, Matplotlib, Kepler Dataset

- Developed ExoFinder, a Streamlit-based ML platform that achieved 98% accuracy in classifying exoplanet candidates from NASA's Kepler data using XGBoost, LightGBM, and feature selection techniques.

Google – The Gemma 3n Impact Challenge Aug 2025
Project: **Sight Guide - AI-Powered Navigation Assistant for the Visually Impaired**
Tools: Python, Gemma 3n, OpenCV, PyTorch, HuggingFace

- Built a multimodal AI assistant by fine-tuning Gemma 3n on an obstacle dataset, enabling real-time path guidance and hazard detection for visually impaired users via vision-language integration.

AI vs H.I. — A Global Hackathon by CS Girlies July 2025
Project: **Unmask AI - The Bias Detection Lab for LLMs**
Tools: FastAPI, PostgreSQL, OpenAI GPT-4o, SQLAlchemy, Streamlit, Jinja2, WeasyPrint, Railway, Docker

- Built a FastAPI–PostgreSQL backend with OpenAI GPT integration to detect and cross-examine cultural and ideological bias in AI outputs, enabling structured LLM evaluation and transparent, insight-driven reporting.

SKILLS

Languages:	Python, R, C/C++, SQL
Frameworks:	FastAPI, Flask, Django, Streamlit
Libraries:	Pandas, Numpy, Scikit-Learn, Matplotlib, Seaborn, Tensorflow, Keras, PyTorch, OpenCV
Databases:	PostgreSQL, SQL Server, MySQL, SQLite, MongoDB
Cloud and DevOps:	AWS, GCP, Docker, Linux, CI/CD, Git, GitHub, HuggingFace
LLMs & AI APIs:	OpenAI API, Gemini, Gemma 3 series, ChromaDB, Pinecone, LangChain, YOLO
Softwares:	VS Code, Cursor, Jupyter Notebook, Anaconda

COURSES & CERTIFICATIONS

Data Analyst 101	Simplilearn	July 2025
Introduction to Generative AI Studio	Simplilearn	July 2025
CS50's Introduction to Artificial Intelligence with Python	Harvard University	March 2024
Tensorflow for Deep Learning	Udacity	April 2023

LEADERSHIP EXPERIENCE

Assistant Vice President | FAST Society of Data Science May 2023 – Sept 2024

- Led a 20-member team of heads and volunteers to organize seminars and workshops on AI and data literacy, engaging over 200 participants across the student body.

Marketing Deputy Head | SOFTEC, FAST NUCES Lahore Jan 2022 – Oct 2023

- Led a 10-member marketing team to coordinate with sponsors, IT companies, and software houses, supporting seminar execution and SOFTEC's flagship tech exhibition.