Shahab Zaib

Artificial Intelligence Engineer

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SKILLS SUMMARY

Languages:	Python, C++, SQL
ML Frameworks:	PyTorch, Scikit-Learn, TensorFlow, Keras
GenAI Tools:	Hugging Face, QLoRA, Stable Diffusion, Realistic Vision, Mistral, LLaMA
Time Series:	FB-Prophet, ARIMA, SARIMA, LSTM, ClimaX
Visualization:	Matplotlib, Seaborn
Platforms:	Google Colab, Jupyter Notebook, Visual Studio Code
Other Tools:	Git, Prompt Engineering, OpenWeather API

PROFESSIONAL EXPERIENCE

National Disaster Management Authority **1/2025 – Present**

Key Responsibilities

- Built a real-time advisory system using Mistral LLM + OpenWeather API, delivering 30-minute weather alerts with actionable safety recommendations.
- Fine-tuned LLaMA2-13B on Pakistan-specific datasets, outperforming most models in localized advisory relevance.
- Developed a BERT-based alert model to detect social-media emergencies with planned 15-minute latency.
- Implemented a hybrid FB-Prophet + LSTM pipeline (MSE ≈ 1.5) and evaluated ClimaX for regional forecasting, identifying its 32×32 resolution limits.

Research Assistant: Hong Kong Polytechnic University **7/2023 – 02/2024**

Key Responsibilities

- Compiled 80+ datasets, including numerical ratings, written feedback, and systematized them into CSV and Word files.
- Performed statistical and thematic analysis on collected data, validating research assumptions with 25% higher accuracy.
- Implemented machine learning algorithms (e.g., regression and clustering) and NLP techniques to analyze data, achieving a 15% increase in research output.

Research Assistant: IQRA National University **6/2021 – 6/2023**

Key Responsibilities

- Sourced, combined, and preprocessed 45,000+ Plant Village images from Kaggle, reduced redundancy by removing 90% of similar images to create a high-quality dataset of 27,000 images.
- Verified various deep learning and machine learning models for plant disease detection and spray prescription achieving a high accuracy of more than 99%.

Freelancing **1/2023 – 3/2023**

Key Responsibilities

- Delivered ML solutions for 5+ global clients that raised client operations by 10-20%.
- Deployed deep learning models, including CNNs and ANNs, attaining high performance.
- Applied NLP techniques for text classification and sentiment analysis, enhancing client applications by 15%.

PROJECTS

Auto Weather Advisory System using Mistral LLM:

Developed a real-time advisory generation pipeline using the Mistral large language model.

- Integrated OpenWeather API and formatted structured prompts to generate updates every 30 minutes.
- System identified events like rain, heatwaves, floods, and storms, and produced clear, actionable advisories with risk warnings and safety guidelines.
- Demonstrated effective use of open-source LLMs in public safety and disaster management

Fine-tuned Setup with LLaMA 3.2 (8B) + QLoRA:

Built a local deployment pipeline for LLaMA 3.2 using 4-bit quantization (QLoRA).

- Loaded and configured tokenizer, tokenizer-padding, and streaming input in decoder format for training.
- Engineered a dataset of 150,000+ input-output-constraint triplets, optimizing the data structure for domain-specific fine-tuning and improving model accuracy by 7% on downstream tasks related to code generation.

- Demonstrated full-stack LLM readiness, from inference to fine-tuning format.

Adaptive Learning Rate Algorithm for GAN – MS Research (Novel Research):

- Pioneering a novel adaptive learning rate algorithm for GANs to stabilize training, achieving 30% faster convergence in preliminary tests.
- An algorithm that updates the learning rate of the Discriminator and Generator to solve instability problems.

Text-to-Image Generation with Stable Diffusion 2 & Realistic Vision

Used pretrained diffusion models to generate high-quality images from natural language prompts.

- Implemented pipelines using SD 2.1 and Realistic Vision models for domain-specific imagery.
- Handled sampling strategies, prompt tuning, and resolution upscaling to achieve photorealistic outputs.

ClimaX for Long-Term Weather Forecasting (Exploratory Study)

Experimented with the ClimaX pretrained transformer model for climate trend analysis.

- Applied global ERA5 reanalysis data but observed severe loss in local prediction accuracy due to 32×32 spatial downscaling.
- Identified need for region-specific adaptation or hybrid modeling.
- Project was paused as per research guidance, but technical findings remain valuable.

RESEARCH PUBLICATIONS

1. **Enhanced deep learning architecture for rapid and accurate tomato plant disease diagnosis:**
   Google Scholar Link: *Published in AgriEngineering*, 2024

2. **Exploring designers' cognitive abilities in the concept product design phase through traditional and digitally-mediated design environments:**
   Google Scholar Link: *Published in Proceedings of the Design Society*, 2024

EDUCATION

IQRA National University **10/2018 – 9/2022**
BS Computer Science CGPA 3.45/4
Malakand University **10/2024 - Present**
MPhil Computer Science (Generative AI)

CERTIFICATIONS

Coursera – DeepLearning.AI

- Neural Networks & Deep Learning
- Supervised Learning: Regression & Classification
- Unsupervised Learning, Recommenders, Reinforcement Learning

ACHIEVEMENTS

- **Research Grant Awardee**: $15K funding from University of Parthenope, Italy
- **Paper Accepted:** Proceedings of the Design Society, 2024. AgriEngineering
- **Bs Research Topper:** High distinction ranked in Final Year Thesis (BS)
- **Kaggle Competitions**: Top 500 (Titanic), Top 10% (NLP Disaster Tweets)
- **Top 1% MPhil Candidates:** Shortlisted by Cambridge, Toronto, Zhejiang