

# Zain Abbas

AI & Machine Learning Engineer — Computer Vision — Deep Learning — Python

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## Summary

AI and Machine Learning Engineer with proven experience developing and deploying intelligent systems across Computer Vision, Deep Learning, NLP, and Retrieval-Augmented Generation. Skilled in translating complex business requirements into robust, scalable ML solutions with measurable outcomes. Strong command of the end-to-end machine learning pipeline, with a track record of delivering high-performance models in collaborative, remote environments.

## Education

### Bachelor of Science in Computer Engineering

2022 – 2026

University of Engineering and Technology (UET), Taxila, Pakistan

Specialization: Artificial Intelligence, Machine Learning, Deep learning, Computer Vision

## Technical Skills

**Languages & Frameworks:** Python 3.x, TensorFlow, Keras, PyTorch, Scikit-learn, LangChain, HuggingFace, MATLAB

**Computer Vision:** YOLOv8 (Ultralytics), OpenCV, MobileNetV2, DenseNet121, EfficientNet, Grad-CAM / XAI

**ML/DL Techniques:** Transfer Learning, Fine-Tuning, CNN, LSTM, RNN, BERT, Transformers, RAG, FAISS

**Data & Analysis:** Pandas, NumPy, Matplotlib, Seaborn, XGBoost, LightGBM, Feature Engineering, EDA

**Deployment & Tools:** Streamlit, Flask, FastAPI, Jupyter, Google Colab, Git & GitHub, VS Code, Kaggle

## Experience

### Freelance AI & Machine Learning Developer

2023 – 2024

Self-Employed · Fiverr (Remote, International Clients)

- Achieved Fiverr Level 1 Seller status; delivered custom ML, Deep Learning, and Computer Vision solutions to clients across the US, Europe, and Asia.
- Managed full project lifecycle remotely: requirements gathering, model development, performance reporting, and post-delivery support.
- Maintained 5-star rating through on-time delivery and professional English communication with international clients.

## Projects

### Multi-Disease Medical Diagnosis – Chest X-Ray AI

*Mean AUC: 0.72 / 14 diseases*

- Trained DenseNet121 to detect 14 chest diseases on 4,999 NIH X-ray images; implemented Grad-CAM heatmaps for explainability.
- 2-phase training (frozen head to 60-layer fine-tune) pushed Mean AUC from 0.52 to 0.72; deployed as a Streamlit dashboard.

### RAG Chatbot – Conversational AI over Any Document/URL

*PDF + URL · Multi-turn memory*

- Built a complete RAG pipeline: PDF ingestion + URL scraping, FAISS vector store, semantic retrieval, and LLM answer generation.
- Supports multi-turn conversation memory and chunk-level search with relevance scores.

### Stock Price Forecasting – Stacked LSTM

*TSLA  $R^2$ : 0.91 · GOOGL  $R^2$ : 0.83*

- Built 3-layer stacked LSTM with 60-day sequence windows on 6 years of Yahoo Finance data; generates rolling 30-day forecasts.
- Shipped interactive Streamlit dashboard with real-time stock fetch, MA20/50/200 overlays, and multi-stock comparison.

### Real-Time Person Detection – YOLOv8

*mAP@0.5: 0.525 · 6ms/img CPU*

- Deployed YOLOv8n (COCO-pretrained) for real time person detection across images, video files, and live webcam feed CPU-only, no GPU required
- Open sourced on GitHub; received community engagement and unsolicited repo requests from LinkedIn connections within days of posting

### Face Mask Detection + Live Webcam Dashboard

*Transfer Learning · Real time*

- Fine tuned MobileNetV2 for real time mask/no mask classification; built a Streamlit dashboard with a live webcam feed, batch image analysis, and workplace compliance rate reporting

### NLP Sentiment Analysis – Multi Model Benchmark

*4-model comparison*

- Benchmarked Logistic Regression, SVM, Stacked LSTM, and BERT Transformer on Twitter sentiment data; built 'Neural Pulse' Streamlit dashboard with real-time text scoring and CSV batch export

### Cat vs Dog Image Classifier – CNN Transfer Learning

*96–98% Test Accuracy*

- Designed and compared a Custom CNN from scratch (3 conv blocks, BatchNorm, Dropout) vs MobileNetV2 fine-tuned on 10,000 images; evaluated with ROC-AUC, confusion matrix, and F1 score

## Certifications

- Google Data Analytics Certificate – Google Career Certificates, 2025

## Interests

Computer Vision, Deep Learning, Natural Language Processing, Retrieval-Augmented Generation, MLOps, AI for Healthcare