

Adeel Mukhtar

AI/ML Engineer — Machine Learning Researcher — Deep Learning Specialist

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PROFESSIONAL SUMMARY

AI/ML Engineer with 3 years of freelancing experience, 1 year of professional industry experience, and 1 year of academic research experience in developing production-ready machine learning models, AI agents, and deep learning solutions. Expertise in Large Language Models (LLMs), computer vision, and explainable AI, with a focus on medical AI applications. Published researcher with 3 peer-reviewed papers in AI applications for healthcare. Proven track record delivering AI solutions across FinTech, healthcare, and research domains through independent consulting, corporate roles, and academic research. Strong background in Python, TensorFlow, PyTorch, and MLOps practices.

TECHNICAL SKILLS

Programming Languages: Python, R, SQL, JavaScript, C++, CUDA, MATLAB
AI/ML Frameworks: TensorFlow, PyTorch, Scikit-learn, Hugging Face Transformers, Keras, XGBoost
Large Language Models: GPT, BERT, LLaMA, Qwen, Ollama, Fine-tuning, RLHF, RAG
Deep Learning: CNN, RNN, LSTM, Transformers, Attention Mechanisms, GAN, Autoencoders
Computer Vision: OpenCV, YOLO, ResNet, VGG, Object Detection, Image Segmentation
MLOps & Deployment: Docker, Kubernetes, MLflow, Git, CI/CD, AWS, Azure, Google Cloud
Data Science: Pandas, NumPy, Matplotlib, Seaborn, Apache Spark, Data Mining, Statistics
AI Agent Frameworks: LangChain, LangGraph, CrewAI, AutoGen, Multi-agent Systems
Databases: MySQL, PostgreSQL, MongoDB, Vector Databases (Faiss, Chroma, Pinecone)
Explainable AI: LIME, SHAP, GradCAM, Integrated Gradients, Attention Visualization

EDUCATION

University of Engineering and Technology <i>Bachelor of Science in Biomedical Engineering, Minor in AI</i>	Lahore, Pakistan Nov. 2021 – May 2025
National University of Sciences & Technology (NUST) <i>Advanced AI Bootcamp for Large Language Models</i>	Islamabad, Pakistan July 2024 – Sep 2024

RESEARCH EXPERIENCE

Undergraduate Research Assistant <i>University of Engineering and Technology</i>	September 2023 – September 2024 Lahore, Pakistan
<ul style="list-style-type: none">Led research on explainable AI for medical diagnostics, resulting in 3 peer-reviewed publications at IEEE conferences with 2 journal articles in process of completionDeveloped novel deep learning architectures for Parkinson's disease detection from voice signals using Attention ResNet18 and advanced interpretability techniquesPioneered hybrid LSTM-Attention frameworks for cardiac abnormality classification from ECG signals, advancing non-invasive diagnostic capabilitiesConducted extensive literature reviews on CNN-GCN approaches for blood cancer detection, contributing to enhanced diagnostic accuracy in hematologyCollaborated with medical professionals to validate AI models for clinical applications, ensuring real-world applicability and regulatory compliance	

FREELANCING EXPERIENCE

Freelance AI/ML Engineer <i>Independent Consultant</i>	May 2022 – Present Remote
<ul style="list-style-type: none">Delivered 25+ AI/ML projects for clients across healthcare, finance, and technology sectors, for 3 yearsSpecialized in developing custom machine learning models, computer vision solutions, and data analysis pipelines for small to medium businessesCollaborated with cross-functional teams remotely, managing project timelines and delivering solutions within budget constraints	

PROFESSIONAL EXPERIENCE

AI Engineer

September 2025 – Present

CataLyst4AI

Lahore, Pakistan

- Developing AI-driven solutions for medical diagnostics, focusing on deep learning models for disease detection and patient monitoring in healthcare applications
- Implementing explainable AI techniques to ensure transparency and compliance in medical AI systems, improving trust in clinical decision-making
- Collaborating with healthcare professionals to design and deploy AI models for real-time medical imaging and data analysis, enhancing diagnostic accuracy
- Optimizing MLOps pipelines for scalable deployment of medical AI models using Docker, Kubernetes, and cloud platforms

Associate AI Engineer

May 2025 – August 2025

GICOH (Gourmet)

Lahore, Pakistan

- Developed and deployed AI agents for FinTech automation using Small Language Models (SLMs), reducing manual processing time by 60% and improving workflow efficiency
- Implemented knowledge distillation pipelines to create custom SLMs for financial systems, achieving 40% reduction in model size
- Built multi-agent systems using LangGraph, LangChain, and CrewAI for automated data extraction, analysis, and pendency management in financial operations
- Architected RAG (Retrieval-Augmented Generation) systems with vector databases for real-time financial document processing and query resolution

LLM Research Intern

January 2025 – August 2025

SkyLabs AI

Remote

- Leading research on autoformalization pipeline for interactive theorem proving using LEAN4, advancing automated mathematical reasoning capabilities
- Developed novel approaches to bridge natural language mathematical statements with formal proofs, improving formalization accuracy by 25%
- Collaborated with international research team to publish findings on AI for mathematical reasoning and automated proof generation

IT Intern - Data Science & AI

May 2024 – July 2024

CareCloud

Islamabad, Pakistan

- Automated medical billing pipeline using Flask and machine learning, reducing processing errors by 35% and improving billing accuracy
- Performed comprehensive analysis on patient datasets with 100K+ records, extracting actionable business intelligence insights
- Developed predictive models for patient care analytics, enabling proactive healthcare intervention strategies

Research Engineer

October 2023 – May 2024

Aura Health Labs, UET Narowal Campus

Narowal, Pakistan

- Developed RehabFlex elbow rehabilitation device under supervision of Dr. Rehan Ch (HOD Biomedical Engineering), integrating smart sensors and AI-driven therapy protocols
- Implemented AI algorithms for medical diagnostics and rehabilitation monitoring, improving patient recovery tracking accuracy by 45%
- Collaborated with biomedical engineering team to design and test innovative rehabilitation technologies for upper limb recovery
- Conducted clinical validation studies and data analysis for medical device optimization, ensuring compliance with healthcare standards

Machine Learning Intern

May 2023 – July 2023

InfoAid Tech

Remote

- Designed and optimized deep learning models for facial recognition systems, achieving 96% accuracy on diverse datasets
- Implemented advanced feature extraction techniques and model optimization strategies, reducing inference time by 30%

KEY PROJECTS

- FinanceAI Agent** | *Python, LangChain, Ollama, SQLite, RAG, Streamlit* June 2025
 - Developed privacy-first AI agent using Qwen 2.5 8B model for financial pattern recognition and anomaly detection in transaction data
 - Implemented offline RAG system processing 1M+ financial records, ensuring complete data privacy with zero external API dependencies
- MedXAI - Explainable Medical AI** | *TensorFlow, Flask, React, GradCAM, LIME* Jan 2024 – June 2024
 - Built explainable AI system for pneumonia detection achieving 97.8% accuracy with transparent decision-making using attention mechanisms
 - Integrated bias-free deep learning models trained on diverse medical datasets (NIH, MIMIC, Stanford) with automated report generation
- Real-Time Violent Crowd Detection** | *OpenCV, YOLO, Python, Computer Vision* Oct 2024
 - Developed AI-powered surveillance system for Punjab Safe City Authority using computer vision to detect violent behavior in CCTV feeds
 - Achieved real-time processing of multiple video streams with 92% accuracy in crowd behavior classification

PUBLICATIONS & RESEARCH

- Detection of Parkinson’s Disease From Voice Signals Using Explainable AI** - IEEE ETECTE’24 (97.8% accuracy using Attention ResNet18)
- Hybrid LSTM-Attention Framework for Cardiac Abnormalities Classification** - IEEE ETECTE’25 (Enhanced ECG signal analysis)
- Hybrid Deep Learning for Blood Cancer Detection: CNN-GCN Approach** - IEEE ETECTE’25 (Advanced diagnostic accuracy)

CERTIFICATIONS & AWARDS

- AI/ML Certifications:** Advanced AI Bootcamp for LLMs (NUST), Prompt Engineering (Vanderbilt), AI Agents (Scrimba)
- Professional Certifications:** Micro1 Certified Data Scientist, Upwork Certified ML Engineer, Docker Certified Associate
- Technical Certifications:** IBM Machine Learning, Google Python, Deep Learning with TensorFlow, Computer Vision