TASAWAR ABBAS KHAN

AI Researcher & Machine Learning Engineer

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LinkedIn — GitHub: tasawarkhan-prog — Hugging Face — IEEE Publication

PROFESSIONAL SUMMARY

Results-driven AI Engineer and Researcher specializing in Large Language Models (LLMs), Retrieval-Augmented Generation (RAG), and Explainable AI (XAI). Proven expertise in building end-to-end multi-agent systems, integrating foundation models (Llama, Gemini), and developing transparent deep learning architectures for mission-critical domains. Adept at translating complex research into scalable production pipelines utilizing PyTorch, FastAPI, and Vector Databases to solve complex engineering and healthcare challenges.

TECHNICAL CORE COMPETENCIES

- **Generative AI & NLP:** Large Language Models (LLMs), Multi-Agent Systems, RAG Pipelines, Semantic Search, Hugging Face, LangChain, LangGarph, BERT.
- **Computer Vision & XAI:** CNNs, ResNet, EfficientNet, U-Net, Grad-CAM, SHAP, YOLO Object Detection.
- **Frameworks & Libraries:** PyTorch, TensorFlow, Keras, Scikit-learn, FAISS, Sentence Transformers, OpenCV.
- **Backend & Deployment:** FastAPI, Docker, Gradio, Streamlit, Git, REST APIs.
- **Programming & Data:** Python, C++, JavaScript,Nodejs, MYSQL, NoSQL, Pandas, NumPy.

SELECTED PROJECTS & PUBLICATIONS

- **MedReason-RAG — Evidence-Grounded Clinical Reasoning System**
  Architected a multi-agent medical AI utilizing live PubMed API (5M+ papers) to generate evidence-grounded differential diagnoses. Eliminated LLM hallucinations via FAISS vector embeddings and integrated Vision-Language Models (VLMs) for automated analysis of X-rays and MRI scans.

- **DermaAI Pakistan v2.0 — Explainable Dermatology Assistant**
  Developed a bilingual Multi-Agent RAG application for analyzing skin conditions. Trained a custom EfficientNet-B0 model via PyTorch and integrated Grad-CAM heatmaps to provide Explainable AI (XAI) insights, visually highlighting lesion focus areas for clinical trust.

- **ResumeRadar — AI-Powered Job Match Engine**
  Built a full-stack semantic matching engine analyzing resumes against job descriptions in under 30 seconds. Engineered a FastAPI backend utilizing cosine similarity scoring (Sentence Transformers) for skill gap analysis, deployed seamlessly alongside a Next.js frontend and Hugging Face Gradio interface.

- **FIRE (Feature Interaction & Rule-based Explainability) Framework** *[Published Paper]*
  Authored and published a novel hybrid deep learning architecture in IEEE Xplore achieving 86.46% precision. Solved the "black-box" AI problem in medical diagnostics by translating deep neural network predictions into transparent XGBoost rules via SHAP.

- **Generative AI & RAG Agents**
  Developed conversational agents combining Hugging Face models and LangChain to retrieve real-time contextual data from vectorized bases, optimizing prompt engineering for safe and highly accurate responses.

- **Medical Diagnostics CV Suite**
  Engineered high-accuracy pipelines utilizing U-Net (segmentation), ResNet (classification), and Grad-CAM for medical imaging, functioning alongside CNN/SVM architectures for cancer detection.

INDUSTRY & ACADEMIC EXPERIENCE

Lecturer Artificial Intelligence (Technical Lead) Mar 2025 – Jun 2026
Shifa Tameer-e-Millat University, Islamabad

- Managed advanced laboratory environments for Machine Learning, ANN & Deep Learning, and Parallel & Distributed Systems.
- Architected technical assignments and conducted rigorous code reviews to ensure adherence to industry-standard programming practices.

AI/ML Engineering Intern (Remote) Mar 2026 – Apr 2026
Developers Hub Corporation

- Engineered NLP solutions by fine-tuning BERT and deployed LLMs for automated support ticket tagging using few-shot learning.

- Built context-aware RAG chatbots using LangChain to accurately retrieve external information from vectorized document stores.
- Designed production-ready ML pipelines utilizing Scikit-learn for automated data preprocessing and hyperparameter tuning.

Deep Learning & Computer Vision Intern (Remote) Nov 2025 – Dec 2025
Arch Technologies

- Developed robust CV models utilizing CNNs for real-time Face Mask Detection and Traffic Sign Recognition.
- Applied transfer learning (ResNet50, VGG-16) to build pipelines capable of diagnosing complex plant diseases from image datasets.

Machine Learning Intern (Remote) Aug 2025 – Sep 2025
Elevvo

- Executed comprehensive data analytics and machine learning tasks covering supervised/unsupervised learning methodologies and feature engineering.

EDUCATION

PhD in Computer Science (Artificial Intelligence) Feb 2026 – Present
COMSATS University Islamabad

MS in Computer Science (Artificial Intelligence) Sep 2022 – Dec 2024
COMSATS University Islamabad

BS in Computer Science Sep 2018 – July 2022
University of Sargodha

PROFESSIONAL CERTIFICATIONS

– **Machine Learning Specialization:** Stanford Online & Coursera (Supervised, Unsupervised, Advanced Algorithms)

– **AI For Everyone:** DeepLearning.AI

– **Data Analytics & Business Intelligence:** DigiSkills.pk