

# Muhammad Akbar | AI Engineer

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## Professional Summary

Innovative AI & Machine Learning Engineer with over 3+ years of hands-on experience in designing, deploying, and optimizing AI/ML, GenAI and LLM-based solutions. Proven expertise in transformer architectures, MLOps, and statistical modeling. Adept at cross-functional collaboration to deliver scalable AI-driven applications aligned with business goals.

**Available for immediate relocation or remote roles.**

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## Professional Experience

### Machine Learning Engineer

**RolusTech | Remote, Dallas, USA**

**Jun 2023 – Present**

- Designed and deployed advanced AI and ML systems, integrating deep learning, reinforcement learning, and vector-based retrieval for predictive analytics and decision-making.
- Developed scalable NLP solutions using Hugging Face Transformers, spaCy, and OpenAI APIs for sentiment analysis and document processing.
- Implemented vector search systems using Weaviate and Pinecone to enable real-time, semantic data retrieval.
- Built autonomous agentic systems for task management, leveraging role-based orchestration in dynamic environments.
- Managed end-to-end MLOps workflows with MLflow and Docker for model deployment and versioning.
- Developed and fine-tuned large language models (LLMs) using LoRA/PEFT for chatbot applications, integrating with Azure Vector Databases.
- Optimized computer vision pipelines for object detection and image segmentation using pre-trained models.
- Built interactive dashboards to visualize system performance metrics and business insights.

### Artificial Intelligence Engineer (Explainable AI)

**National Center for Artificial Intelligence | Islamabad, Pakistan**

**Jan 2023 – May 2023**

- Developed explainable AI solutions using SHAP and TCAV to improve interpretability and fairness in diagnostic models.
- Built classification pipelines with VGG16 for feature extraction, achieving high accuracy on custom datasets.
- Enhanced model transparency through dimensionality reduction and advanced data visualization techniques.

### Generative AI Project Lead

**California State University Long Beach | Remote, California, USA**

**Sep 2022 – Dec 2022**

- Pioneered the integration of generative AI technologies, including GPT and Text-to-SQL models, for automating data retrieval.
- Researched vulnerabilities in LLMs using the CWE dataset and proposed solutions to enhance robustness.

### Software Engineer

**Disruptive Effects | Remote, Florida, USA**

**Feb 2021 – Sep 2022**

- Developed RESTful APIs with PHP Laravel and Python, streamlining data handling for e-commerce platforms.

- Implemented full-stack web solutions using Laravel, Vue.js, and MySQL, boosting system reliability and scalability.
- Optimized database structures for improved query efficiency and third-party integration.

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## **Technical Skills**

**Programming Languages:** Python, R, C++, SQL, JavaScript, PHP

**AI/Machine Learning:** PyTorch, TensorFlow, Scikit-learn, Hugging Face, Transformers, Reinforcement Learning (OpenAI Gym, Ray RLlib)

**Generative AI:** GPT, DALL-E, GANs, StyleGAN, Text-to-SQL

**Vector Databases:** Weaviate, Pinecone, Milvus

**MLOps:** Docker, Kubernetes, MLflow, TensorFlow Serving

**Big Data Tools:** Apache Spark, Kafka, Hadoop

**NLP Tools:** spaCy, Hugging Face, NLTK

**Explainability and Fairness:** SHAP, LIME, Fairlearn

**Visualization:** Matplotlib, Plotly, Tableau

**DevOps:** Azure, AWS, Kubernetes, CI/CD Pipelines

**Project Management:** Agile, Scrum, Jira, Trello

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## **Key Projects**

### **Fine-Tuning LLMs for Personalized AI Solutions**

- Customized transformer models for real-time personalization, workflow automation, and advanced content generation.
- Utilized attention mechanisms and sequence modeling for domain-specific applications.

### **RAG-Based Automation System**

- Designed and deployed a Text-to-SQL solution that automated complex query generation for enterprise software.
- Optimized retrieval mechanisms using LangChain and Hugging Face Transformers.

### **Generative AI for Diagnostic Tools**

- Applied generative techniques to medical imaging datasets, improving diagnostic accuracy and interpretability.

### **Computer Vision Model Optimization**

- Integrated pre-trained models for tasks like object detection and segmentation, achieving real-time performance metrics.

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## **Achievements and Certifications**

- **Certified ML Engineer**, Microsoft Azure AI
- Achieved a **90%+ inference accuracy** on multiple GenAI applications in production.
- Published research on transformer-based diagnostic tools at a regional AI symposium.
- Successfully led the deployment of AI systems in production environments, improving operational efficiency by 30%.
- Built generative AI solutions that reduced manual query time by 50%.
- Optimized ML workflows, cutting deployment time from weeks to days.
- Spearheaded explainable AI initiatives to ensure compliance with regulatory standards.

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## **Education**

### **Master's in Computer Science**

National University of Science and Technology (NUST), Islamabad, Pakistan

**Sep 2022 – May 2024**

### **Bachelor's in Computer Science**

University of Agriculture (UAF), Faisalabad, Pakistan

**Sep 2017 – May 2021**