

# BALKHAIR, MOHAMMED AHMED M

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 Balkhair Mohammed

 GitHub

 Portfolio

## Summary

**CS Graduate & AI Specialist** focused on end-to-end ML, DL, and GenAI (LLMs, GANs, Diffusion). Expertise in building and deploying scalable AI agents and architectures (Transformers, CNNs, GNNs) using Python, PyTorch, FastAPI, and Docker.

## Education

### Computer Science Bachelor's Degree

King Abdulaziz University, 4.83/5 GPA - First Honors

2021 – 2025

Jeddah, Saudi Arabia

## Professional Experience

### AI Research Trainee , University Health Network

- **Engineered** optimized data pipelines for drug–protein interaction; performed end-to-end preprocessing and feature engineering to boost downstream experiments.
- **Developed** and benchmarked GNNs, GANs, and Diffusion models using PyTorch, leveraging pre-trained protein language models (**ESM**).

06/2025 – 08/2025

Toronto, Canada

### Data Scientist , Saudi Aramco (internship)

- **NLP Classification:** Developed patent domain classifiers using BERT, TF-IDF, and Scikit-Learn, achieving high-accuracy technical domain mapping.
- **Data Automation:** Engineered Python/Selenium scripts to automate bulk extraction from USPTO, significantly reducing manual data collection time.
- **Cross-Functional Integration:** Partnered with IP experts to integrate AI model outputs into formal decision-making workflows and reporting systems.

06/2024 – 08/2024

Dhahran, Saudi Arabia

## Projects & Researches

### DARIP : Daily AI-Generated Recaps in Podcast

- **GenAI Pipeline:** Integrated RSS scraping, RAG, and LLM-based dialogue generation with TTS synthesis for automated content creation.
- **Infrastructure & Deployment:** Leveraged **LangGraph** for multi-agent orchestration and **FastAPI/Docker** for scalable, cost-efficient deployment.

### AI-LAB: Cloud-Based Machine Learning Model Hosting Platform

- **AI Model Hosting Platform:** Designed and deployed a scalable platform for hosting models via API using **FastAPI** and **Docker**.
- **Infrastructure Abstraction:** Streamlined AI experimentation by abstracting infrastructure management, allowing users to deploy and test models via a seamless API interface.

### Development of MutDTA Models for Drug-Target Binding Affinity Prediction (Research)

- **Developed** multi-modal GNN-based DTA models for protein-ligand embeddings and 3D pose generation (GANs/Diffusion).
- **Enhanced** binding-affinity accuracy for cancer proteins, directly supporting downstream lab experiments .

## Certificates :

**KAUST:** AI Specialization (440 hrs).

**DeepLearning.AI**  : Math for ML & DL Specialization

**DeepLearning.AI**  : Hyperparameter Tuning.

**IBM:** Back-End Developer Professional Certificate

## Skills

### Technical

- **Languages & Data:** Python, Java, SQL, NumPy, Pandas, Matplotlib.
- **AI Specialization:** ML, DL, CV, NLP, LLMs, GANs, Diffusion, GNNs, Transformers.
- **Frameworks:** PyTorch, TensorFlow, Keras, Scikit-Learn, Hugging Face.

### Soft Skills

English proficiency ( IELTS : 6.5 ) , Problem Solving , Critical thinking, Quick learner , Time management , Teamwork , Self-Motivation

### Development

FastAPI, Flask, LangGraph, Docker, DigitalOcean, Git