BALKHAIR, MOHAMMED AHMED M

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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 2021 – 2025
King Abdulaziz University, 4.83/5 GPA - First Honors Jeddah, Saudi Arabia

Professional Experience

AI Research Trainee , University Health Network 06/2025 – 08/2025
Toronto, Canada

- **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**).

Data Scientist , Saudi Aramco (internship) 06/2024 – 08/2024
Dhahran, Saudi Arabia

- **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.

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 : Hyperparameter Tuning.

DeepLearning.AI : Math for ML & DL Specialization

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 , Problem Solving , Critical thinking, Quick learner , Time management , Teamwork , Self-Motivation

Development

FastAPI, Flask, LangGraph, Docker, DigitalOcean, Git