Kheem Parkash Dharmani

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Summary

As a Machine Learning Engineer with extensive experience in developing AI-driven healthcare solutions, I am deeply committed to advancing AI in health applications. My expertise spans Natural Language Processing (NLP), multi-modal health data analysis, and deep learning, with a focus on developing personalized and trustworthy AI systems for healthcare. With a Master's in Data Science, I have applied AI techniques to solve complex problems in medical data analysis, precision medicine, and disease diagnosis. I aim to further my research in AI for healthcare, specifically in predictive, preventive, and personalized medicine, by leveraging large-scale health data and advancing AI methodologies to optimize healthcare processes and improve patient outcomes.

Work Experience

Machine Learning Engineer at **Clinical Pearl, Princeton** Apr 2024 - Present

- Fine-tuned randomized clinical trial models using various language models, including OpenAI, LLAMA, and Mistral.
- Implemented Retrieval-Augmented Generation (RAG) systems to enhance medical chat functionalities, focusing on diseases and pharmaceuticals.
- Developed multi-modal RAG systems that integrate diverse data types and models for comprehensive medical analysis.

Machine Learning Engineer at **Cplus Soft, Islāmābād** Dec 2023 - Mar 2024

- Designed and implemented advanced generative AI models utilizing frameworks such as GPT, Huggingface, and Transformers.
- Integrated LangChain software into various AI projects, enhancing the functionality of AI-driven applications.
- Conducted research on emerging trends in generative AI to drive innovation and improve model performance.

Machine Learning Trainer at **AI Lounge, Gilgit-Baltistan** Jul 2023 - Nov 2023

- Developed and executed a comprehensive Data Science and AI training curriculum.
- Conducted interactive training sessions with a focus on practical skills and real-world applications.
- Enhanced the skillset of participants, contributing to the advancement of the regional tech industry.

NLP Teaching Assistant at **FAST-NUCES, Islamabad Campus** Jan 2023 - Jun 2023

- Improved clarity in explaining complex NLP concepts, contributing to the academic growth of students.
- Provided mentorship and guidance, fostering a supportive and collaborative learning environment.
- Developed and implemented algorithms for NLP tasks, solving practical challenges and driving innovation in the classroom.

Projects

Medical Knowledge Retrieval and Question-Answering System

- Developed a FastAPI-based application to answer medical-related questions using a Retrieval-Augmented Generation (RAG) approach.
- Integrated OpenAI and LangChain to create and manage a vector store from medical data retrieved from Google Sheets.

Master's Thesis: Radiology Report Generation

- Utilized Vision Transformers and a custom-trained Large Language Model to analyze and interpret X-ray images, demonstrating the potential of AI in medical diagnostics and patient care.
- Explored the integration of AI with medical imaging to provide personalized and accurate diagnostic reports, aligning with interests in AI for health applications.

ETL Pipeline for Churn Prediction using MS Azure

- Designed and implemented an ETL pipeline targeting customer churn prediction.
- Utilized OLTP streams to set up a structured SQL database in MS Azure.
- Seamlessly integrated this cloud database with a web interface developed in Streamlit. With the aid of Azure ADF, the pipeline's efficiency was optimized. The primary objective was to identify potential customer churn early on, enabling proactive retention strategies.

Education

2022 - 2024 **MS** (Data Science) at **FAST NUCES, Islamabad** (CGPA: 3.2/4.0)
Research: "A Hybrid Approach for Radiology Report Generation using Vision Transformers & Language Models." Enhanced automated lung cancer diagnosis via deep learning, leveraging radiology literature and the MIMIC CXR dataset. The research innovatively combined vision transformers with large language models, optimizing report generation and summarization, and providing critical insights for improving patient care outcomes.

2017 - 2021 **B.E** (Computer Systems) at **Mehran, UET, Jamshoro** (CGPA: 3.7/4.0)

Skills

Programming Languages	Python, R, SQL
Machine Learning Frameworks	Pytorch, Tensorflow, Keras, Scikit-Learn
Deep Learning	CNNs, RNNs, LSTM, Autoencoders
Natural Language Processing	LLMs, Transformer Architectures, NLTK, SpaCy, BERT, GPT
Cloud Computing Platforms	AWS Solution Architecture, MS Azure (Azure Data Factory Service, Azure Cognitive Services)
Data Visualization	Tableau, Matplotlib, Seaborn
Version Control	Git, GitHub

Courses

DS5007 - Natural Language Processing
DS5002 - Data Science Tools and Techniques
SAA-C03 - AWS Solution Architecture
DS5006 - Deep Learning
DS5004 - Machine Learning
Data Mining

Certifications

Machine Learning Specialization — *DeepLearning.AI, Dec 2023*

Advanced Learning Algorithms — *DeepLearning.AI, Oct 2023*

Python for Data Science, AI & Development — *IBM, Mar 2023*

Supervised Machine Learning: Regression and Classification — *Stanford Online, Mar 2023*

Data Science For Everyone — *DataCamp, Apr 2022*

Machine Learning For Everyone — *DataCamp, Apr 2022*

Achievements

IEEE eLearning Course Trial Award Sep 2023

IEEE Xplore Challenge for Researchers in Pakistan 2023

Honored with the IEEE eLearning Course Trial award, presented by IEEE Xplore, in recognition of academic excellence and dedication. This significant achievement, endorsed by FAST-NUCES, Islamabad Campus, culminated in winning an Apple iPad.

Publications

EEBERT: An Emoji-Enhanced BERT fine-tuning on Amazon Product Reviews for Text Sentiment Classification Sep 2024

IEEE Journal

Komal Rani Narejo, Hongying Zan, Kheem Parkash Dharmani, Lijuan Zhou, Tahani Jaser Alahmadi, Nabila Sehito, Yazeed Yasin Ghadi, Muhammad Assam.

Enhancing Emoji-Based Sentiment Classification in Urdu Tweets: Fusion Strategies with Multilingual BERT and Emoji Embeddings Aug 2024

IEEE Journal

Komal Rani Narejo, Hongying Zan, Dina Oralbekova, Kheem Parkash Dharmani, Orken Mamyrbayev, Kuralai Mukhsina.