ABDE MANAAF GHADIALI

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PROFILE SUMMARY

Built a strong foundation in computer science and **machine learning** through rigorous coursework, research, and 3+ years of experience, specializing in **deep learning**, **quantum computing**, and **statistical analysis**, while leading projects on **AI/ML** and **recommendation systems**.

WORK EXPERIENCE

Graduate Teaching Assistant | George Washington University | Washington, DC **June 2024 – May 2025**

Skills and Tech Stack: Python, Java, Matplotlib, Tkinter, Java Swing, Software Engineering, Algorithms, Data Structures

- Evaluated and graded coursework for Python, Java, and Software Engineering while leading Java-based lab sessions to help students grasp concepts of software development, data structures, and algorithms through intuitive, applied learning.
- Conducted review sessions and 1-on-1 mentoring, to support students in tackling problems and troubleshooting programming exercises, while ensuring data privacy and fostering a collaborative and inclusive learning environment.
- Collaborated with the faculty and other teaching assistants to develop innovative teaching strategies and materials, incorporating best practices in software engineering to enhance the learning experience.

Senior ML Engineer and Data Scientist | Thoucentric (A Xoriant Company) | Bengaluru, India **January 2020 - August 2023**

Skills and Tech Stack: Python, Pandas, Scikit-Learn, TensorFlow, PyTorch, PySpark, Django, FastAPI, Dash, Plotly, Databricks, Azure, GCP

- Constructed the data preparation pipeline leveraging SQL and Python to routinely gather, clean and pre-process data for model injections, improving efficiency and data quality for building and optimizing models.
- Developed ML and DL models using Scikit-Learn and TensorFlow for baselining and hyper-parameter tuning, to detect 12 different defects that occur while painting an automobile, with an accuracy of 87% on classical ML and 93% on neural networks.
- Innovated a Recommendation Engine using concepts of thermodynamics to adjust the temperature and humidity, thereby decreasing the defect rates of painting a vehicle by 40% and saving the cost to resolve the defects by 60%.
- Developed and refactored a ML pipeline in Python utilizing Pandas, NumPy, and Scikit-Learn for automating the forecasts on client's data, resulting in a 15% improvement in pipeline execution efficiency with respect to time and model accuracy.
- Applied statistical analysis and machine learning, to train and fine-tune models, to detect faulty car engines based on process and assembly parameters, gaining accuracy of 86% and deploying the solution on client's GCP Kubernetes cluster.
- Built an ML pipeline on Databricks using PySpark, Scikit-Learn and PyTorch, to improve client's forecasting accuracy to 81%, and subsequently developed an API using FastAPI, for hosting the model and generating real-time forecasts.

TECHNICAL SKILLS

Programming Languages: Python (Advance), Java, HTML, CSS, C, C++, OpenQASM.
Frameworks and Libraries: Pandas, NumPy, Scikit-Learn, TensorFlow, PyTorch, Qiskit, Transformers, HuggingFace, PySpark, Matplotlib, Seaborn, Plotly, Dash, Markdown, Django, FastAPI.
Platforms and Tools: Azure, GCP, AWS, Git, Docker, CI/CD, Airflow, MLflow, Tableau, Databricks, MySQL, MongoDB, PostgreSQL.
Research: Foundation Models, Experiment Design, Statistical Analysis, Paper Replicating and Implementation.

PROJECTS

Graph Coloring Using Quantum Circuits | Python, Qiskit, IBM Composer, Qiskit-Aer, IBM-Quantum-Services, IBM-Quantum-Platform

- Conducted an in-depth literature review on graph coloring using quantum circuits and Grover's Algorithm, analyzing research papers, technical reports, and existing methodologies to explore fundamental principles and advancements.
- Developed a node color similarity quantum circuit and implemented Grover's Algorithm from first principles using Python, Qiskit, and IBM Composer, achieving accurate solutions for two- and three-node graphs.

4-Qubit Quantum-RAM | Python, Qiskit, IBM Composer, NumPy, Qiskit-Aer, IBM-Quantum-Services, IBM-Quantum-Platform

- Conducted an extensive literature review on quantum associative memory and quantum-RAM, analyzing research papers, technical reports, and existing implementations to understand key principles and advancements.
- Designed and implemented one, two, and four-bit quantum-RAM using Python and Qiskit, optimizing circuit efficiency by minimizing predefined quantum gates for improved performance and scalability.

AI Generated Text Detection Tool | Python, PyTorch, TensorFlow, GPT, RoBERTa, Llama, Transformers, HuggingFace, NLTK

- Established the data loading and pre-processing pipeline using Python, NLTK, TensorFlow and PyTorch to load 1.2M texts and perform Natural Language EDA, such as analyzing the use of punctuations and stop-words by LLMs vs. Humans.
- Fine-tuned LLM models like RoBERTa, GPT, Llama, and Gemma, employing Word and Sentence Tokenization and Word Embeddings to train on 1.2M texts, achieving 98% accuracy on the test dataset.

Language Detection from Audio using AI | Python, PyTorch, TensorFlow, Audio Transformers, HuggingFace, Librosa, Matplotlib

- Created data loading, pre-processing, and feature extraction pipeline using Python to load 300K audio files and extract vocal features such as MFCC, Energy, and Spectral Distribution using signal processing libraries like Librosa and PyTorch.
- Constructed Neural Networks and Audio Transformers using TensorFlow and PyTorch to train on the extracted features, achieving 98% accuracy on test data.
- Utilized theoretical analysis techniques to refine neural network and transformer architectures for improved model robustness.

EDUCATION

Master of Science in Computer Science (3.82/4.0), George Washington University **August 2023 - May 2025**