Mohamed Hammad

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Summary

AI Engineer with a robust foundation in Computer Vision and extensive real-world Generative AI project experience. Proficient in Python, LLMs, and leading machine learning frameworks, with expertise in Deep Learning, Natural Language Processing, and building scalable, impactful AI solutions. Skilled in developing innovative algorithms, optimizing model performance, and deploying AI systems. Committed to delivering high- quality, practical AI applications that drive business value and solve complex challenges. Strong collaborator with a passion for continuous learning and staying ahead in AI advancements

Experience and Projects

House Price Prediction: Engineered a regression model using advanced techniques like Gradient Boosting and feature engineering to accurately estimate real estate prices based on market trends, achieving 94% accuracy and enabling data-driven decision-making for buyers and sellers.

Fraud Detection System: Designed an advanced fraud detection model using ensemble learning (XGBoost, LightGBM) and anomaly detection techniques, achieving 95% precision in identifying fraudulent transactions for a financial institution.

Diabetes Prediction App : Developed a machine learning-based web application that predicts the likelihood of diabetes based on user-provided medical details. The model is Random Forest Classifier and deployed with Streamlit for an interactive user experience.

E-Commerce Platform : Developed a scalable e-commerce application using Django, containerized with Docker, and integrated with Celery for background task management.

Speech-to-Text Transcription: Implemented a robust speech-to-text pipeline using OpenAI's Whisper model, achieving state-of-the-art accuracy in transcribing multilingual audio data. Optimized the system for low-latency, real-time applications, enabling seamless integration into customer support and voice assistant platforms

Speech Emotion Recognition: Created a deep learning model using CNNs and RNNs to classify emotions from speech data, achieving 87% accuracy on the RAVDESS dataset for applications in customer service.

Recommendation System: Built a hybrid recommendation engine using collaborative filtering and matrix factorization techniques, improving user engagement by 30% for an e-commerce platform.

AI-Powered Travel Agent: Developed an intelligent travel planning agent using LangChain and LangGraph integrated with LLama3.3, designed to suggest personalized 7-day tour itineraries for Egypt

RAG (Retrieval-Augmented Generation): Engineered advanced QA systems by integrating LangChain and LLama3 with vector databases (Pinecone, FAISS) to implement retrieval-augmented generation, enhancing context-aware responses and optimizing the accuracy, relevance, and scalability of information retrieval.

Books Text Summarization: Designed pipelines leveraging advanced NLP techniques and open-source LLMs GPT2 , T5 to efficiently condense lengthy documents into concise, coherent summaries, enhancing readability and information extraction

***Sentiment Analysis* :** models utilizing LSTM and BERT architectures for text classification, achieving high accuracy in sentiment prediction for Twitter and Amazon product reviews.

Image Classification : Developed and implemented image classification pipelines using advanced architectures such as VGG and EfficientNet, achieving high accuracy and efficiency in visual recognition tasks

Object Detection :Designed and deployed custom object detection models utilizing state-of-the-art frameworks including YOLO, SSD, Faster R-CNN, and DETR, tailored for diverse datasets to achieve precise and efficient detection outcomes.

Brain Tumor Detection And Segmentation : Developed an end-to-end deep learning model for brain tumor detection and segmentation using the U-Net architecture, achieving high precision in identifying and delineating tumor regions from medical imaging data.

Car Speed Counter: Automated speed estimation using object tracking and video analysis with YOLOV8

Number Plate Detection : Develop system leveraging YOLO for real-time license plate recognition, integrated with MySQL for efficient data storage and retrieval, and EasyOCR for accurate text extraction, ensuring high accuracy and efficiency in diverse environments

Advanced Data Engineering Pipeline : implemented a scalable data pipeline for real-time . Ingested structured and unstructured data from APIs, and relational databases PostgreSQL .Used PySpark for efficient data transformation and aggregation. Built an end-to-end ETL pipeline to process and load data into Snowflake/BigQuery for analytics. Automated workflows using Apache Airflow, ensuring seamless pipeline execution and data integrity.

Fine-Tuning LLaMA 3.2 on an Arabic Dataset: Developed a custom fine-tuned LLaMA 3.2 model for Arabic natural language processing (NLP) tasks, optimizing it for domain-specific applications such as question answering, text summarization, and sentiment analysis.using LoRA and QLoRA, enabling efficient training on consumer GPUs with PEFT Built a memory-optimized training pipeline using PyTorch, Hugging Face Transformers, and BitsAndBytes, leveraging mixed-precision (FP16/BF16).

SKILLS

- **Programming Languages**: Python
- **Web & API Development** : FastAPI, Streamlit
- **BackEnd:** Django
- **database&Vectordatabase**:SQL,MySQL,FAISS,ChromaDB
- **Data Analysis & Processing**: NumPy, Pandas,Matplotlib
- **Data Engineering**: Pyspark,AirFlow
- **Machine Learning & Deep Learning:** TensorFlow, Keras, PyTorch, scikit-learn
- **Computer Vision:** OpenCV,YOLO, Faster R-CNN, SSD, DETR
- **Natural Language Processing (NLP):** Transformers, BERT, NLTK, SpaCy,Gensim
- **MLOps & Deployment:** MLflow, Docker, Git, GitHub , AWS(Boto3,EC2,Segemaker,Lambda)
- **GenirativeAI & LLM Frameworks:** LangChain,LangGraph,OpenAI, Hugging Face, CrewAI, SmolAgent,LLaMA3,Ollama, DeepSeek-R1

Education

Computer Engineering
Bachelor of Engineering | 2018–2023

Graduated with a strong foundation in computer systems, software development, and advanced algorithms.

Completed mandatory military service post-graduation, demonstrating discipline, leadership, and time management skills.

Languages

Arabic, English