Amr Abdelaty Fathallah

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Education

October 6 University — Cairo, Egypt

Bachelor of Mechatronics Engineering (CGPA: 3.6) — *Oct. 2018 – Jun. 2023*

- Graduation Project: Fire Fighting Robot
- Focus Areas: Stair navigation, joystick control via ROS, fire and human classification, and alert system for water deployment.
- Tools: Python | OpenCV | Keras | ROS | Arduino | SolidWorks

Experience

National Telecommunication Institute (NTI) — Cairo, Egypt

AI Internship — *Nov. 2024 – Feb. 2025*

- Gained skills in presentation, teamwork, project management, and business English.

Samsung Innovation Campus — Cairo, Egypt

AI Internship — *Jul. 2023 – Oct. 2023*

- Implemented data analysis projects and preprocessing techniques for enhanced model learning.
- Developed machine learning models with grid search for hyperparameter optimization.
- Applied ANN, CNN, and RNN architectures for computer vision and NLP tasks.

Projects

AI-Driven Marketing Automation System CrewAI | Hugging Face | RAG | SMTP | Dash | Ngrok

- Fine-Tuning DeepSeek-R1 for Telecom Chatbots:
  - Instruction Fine-Tuning: Converted a telecom dataset into an instruction dataset and fine-tuned DeepSeek-R1-Distill-Llama-8B with QLoRA. Deployed the model on Hugging Face Hub and evaluated performance using LLaMA-3.3-70B-Instruct.
  - Preference Fine-Tuning: Created a preference dataset with Phi4, generating the chosen column via evaluation prompts. Fine-tuned DeepSeek-R1-Telecom-Chatbot using Unsloth and DPOTrainer.
- Real-time Deduplication System: Uses a Vision Transformer (ViT) to efficiently detect and eliminate near-duplicate images in real time.
- Multi-Agent Marketing System: Automated marketing processes with specialized agents:
  - Market Analysis: Tracks trends, analyzes competition, and automates reports email campaigns.
  - Content Marketing: Automates social media and blog content creation.
  - Campaign Optimization: Uses Agglomerative Clustering for segmentation and targeted email campaigns.
  - Data Analysis: Generates interactive dashboards for strategic insights.
- Assistant Chatbot: Uses RAG for real-time, accurate FAQ responses in English and Arabic.

Text Summarization by Fine Tuning pegasus Model Python | Hugging Face | Weights and Biases

- Fine-tuned a pre-trained transformer model pegasuscnn_dailymail on a text summarization dataset using Hugging Face's transformers library, optimizing for abstractive summarization tasks.
- Leveraged Weights & Biases (W&B) for experiment tracking, logging hyperparameters, model performance metrics, and training progress to ensure reproducibility and efficient model tuning.
- Evaluated the model's performance using ROUGE (Recall-Oriented Understudy for Gisting Evaluation) metrics (ROUGE-1, ROUGE-2, and ROUGE-L) to measure the quality of generated summaries against reference texts

RAG-Based AI for Technical Q&A Python | LangChain | Ollama | FAISS Vector Database

- Implemented a RAG model using Ollama for embeddings and LLM inference, extracting key insights from PaulGraham.com essays.
- Developed a retrieval system leveraging FAISS for vector-based search and document summarization.

Jigsaw Toxicity Classification Python | Pandas | Keras | BOW Models

- Developed a text classification pipeline using BoW and Keras for over 130,000 comments.
- Achieved over 85% accuracy and reduced bias in toxicity detection by 15%.

Driver Fatigue Monitoring System Python | Pytorch | YOLOv8 | Streamlit | Flask

- Collected balanced data covering different scenarios for signs of fatigue and distraction; annotated data using Roboflow.
- Built robust model capable of detecting and monitoring signs of fatigue in individuals, using YOLOv8 and PyTorch, achieving a MAP score of 98.2%.
- Implemented real-time detection using OpenCV and deployed it using Flask.
- Designed the front-end web pages to enhance user experience, integrating alert system using pygame.
- Assembled webpage content using Flask for backend management.

Book Recommender System Python | Scikit-Learn | Streamlit

- Built a book recommendation system using collaborative filtering with Python, Scikit-Learn, and KNN algorithms, achieving personalized suggestions based on user-book interactions.
- Developed an interactive Streamlit web app implementing cosine similarity metrics and data preprocessing pipelines, enabling users to discover books with author/year/publisher details and cover images.

E-Commerce Customer Churn Python | Pandas | Plotly | Scikit Learn | Pycaret

- Conducted exploratory data analysis with Pandas and Plotly to answer business questions.
- Built predictive churn models to optimize customer retention strategies.

Walmart Time Series Python | Pandas | ARIMA

- Built time series analysis models to optimize sales forecasting and inventory management.

Skills

Data: Data Analysis, ETL Pipeline, Data Modeling, DWH, SSIS

Data Visualization: Power BI, Python Libraries (Matplotlib, Seaborn, Plotly)

Machine Learning & AI: ML, DL,RNN, LSTM, GRU, Attention Mechanism, Transformer, Vision Transformer, LLM, FineTuning LLM[PEFT, LORA, QLORA], RAG, Multi-Agent Systems, Mixture Of Experts, Vector Databases(FAISS, ChromaDB), web scraping basics

Programming Software Tools: Python, SQL, Object-Oriented Programming (OOP), Data Structures, Algorithms, Git, Docker, Model Deployment (Streamlit, Flask API, Fast API), Hugging face, Pytorch, NLTK, Sklearn, Tensorflow

Soft Skills: Problem-Solving, Critical Thinking, Adaptability, Communication