



Kareem Ayman

AI & Machine Learning Engineer

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🌐 Kareem-Ayman 🔄 Kareem-Ayman 🏆 Kareem Salama 🔗 Portfolio

EDUCATION

M.Sc. in Artificial Intelligence, Benha University 2026 – Present
Faculty of Computers and Artificial Intelligence
Bachelor's Degree in Computer Science, October 6 University 2020 – 2024

WORK EXPERIENCE

Optima Software Solutions 10-2024 – Present
Data Engineer / Machine Learning Engineer , Freelance
Worked on data engineering and machine learning tasks, including data preprocessing, model development, analysis workflows, and AI-based solutions for client projects.

School ++, Programming Instructor 06-2026 – Present
• Teaching programming fundamentals and computational thinking

Programming Instructor, iSchool – Digital Egypt Cubs Initiative (DECI) 03-2026 – 08-2026
• Teaching programming fundamentals and computational thinking to students through the DECI program supported by Ministry of Communications and Information Technology (MCIT).

HACKATHONS & COMPETITIONS

RAG AI Hackathon, Creativa Innovation Hub, Benha 08-2026
Participated in a team-based hackathon focused on building a Retrieval-Augmented Generation (RAG) solution using document retrieval, embeddings, vector search, and LLM-based response generation.

SELECTED PROJECTS

Multi-Agent Research Assistant 📄, Python, LangGraph, FastAPI, Streamlit 07-2026
Built an AI research assistant that uses a Planner-Researcher-Summarizer-Critic workflow to generate source-grounded Markdown/PDF reports with citations, comparisons, limitations, and recommendations. Added web retrieval, report evaluation metrics, Docker support, and a Streamlit UI.

Agentic Data Analyst for CSV and SQL Insights 📄 07-2026
Python, Pandas, Streamlit, SQLite, Matplotlib, Seaborn, Pytest
Built a Python and Streamlit-based data analysis agent that enables users to upload CSV files or query SQL data, automatically validate datasets, generate profiling insights, create visual charts, answer natural language questions, safely execute read-only SQL queries, and export analysis reports as Markdown or PDF. Implemented modular architecture with typed Python services, pandas-based profiling, chart automation, SQL safety checks, and pytest coverage.

Production RAG Assistant 📄, FastAPI, Qdrant, OpenAI, Streamlit, Docker 06-2026
Built a RAG-based document assistant for PDF/DOCX question answering using multilingual embeddings, Qdrant vector search, and gpt-4o-mini for grounded answer generation with source citations. Implemented FastAPI endpoints, Streamlit UI, Docker setup, Pytest unit tests, and simple retrieval/answer evaluation.

EpCare Backend, REST APIs , Backend Development
Built backend services for a healthcare platform, covering core API flows, role-based access, and database models.
Implemented structured endpoints for patient, doctor, appointment, and operational workflows with clean validation and error handling.

Image Captioning 📄, DEPI Graduation Project
Developed an image-captioning system to assist visually impaired users by generating natural-language descriptions of visual scenes.

Predicting Internet Demand in Emerging Urban Areas, Freelance

Using changes in nighttime light intensity to predict future internet demand in emerging urban areas, focusing on regions with rapidly increasing light intensity.

SELECTED RESEARCH PROJECTS

Breast Cancer AI Decision Support & Multi-Omics Analysis

Developed ML pipelines for breast cancer risk prediction, prognosis, subtype classification, and genomic analysis using TCGA-BRCA, METABRIC, GEO, and clinical datasets.

Lung Cancer & Pulmonary Nodule Detection/Segmentation

Developed CT-based detection and segmentation pipelines for pulmonary nodules using deep learning and medical imaging techniques.

Chemotherapy Response Prediction in Breast Cancer

Developed machine learning workflows for predicting chemotherapy response using gene-expression and clinical data.

Hepatocellular Carcinoma Analysis

Developed AI and medical imaging workflows for liver cancer research, including analysis, validation, and manuscript preparation.

Brain Stroke Classification Using CT/MRI Imaging

Developed a deep learning pipeline for multiclass brain stroke classification using CT and MRI images, covering medical image preprocessing, model training, performance evaluation, and research documentation.

Cancer Drug Sensitivity & Response Prediction

GDSC/CCLE, ML Modeling
Developed cancer drug sensitivity prediction workflows using public pharmacogenomic datasets such as GDSC and CCLE, with model training, experiment tracking, and prediction-oriented analysis.

TECHNICAL SKILLS

- **Programming** — Python, SQL
- **ML/DL** — Scikit-learn, XGBoost, TensorFlow/Keras, CNNs, Classification, Model Evaluation
- **LLM & GenAI** — RAG, LangGraph, OpenAI APIs, Embeddings, Vector Databases, Qdrant
- **Computer Vision** — OpenCV, Medical Imaging, Classification, Segmentation
- **Backend & MLOps** — FastAPI, REST APIs, Docker, Streamlit
- **Data Handling & Analysis** — Pandas, NumPy, Matplotlib, data cleaning, SQLite
- **Tools** — Git, GitHub, Google Colab, Jupyter Notebook, VS Code

TRAINING & CERTIFICATIONS

Machine Learning Engineer Program, National Telecommunication Institute 12-2024 – 02-2025

AWS Machine Learning Engineer, DEPI (New Horizons) 04-2024 – 08-2024

Orange Digital Center & Instant – On Site (Full Time) ☑ 08-2022 – 10-2022 | Giza, Egypt
Data Science

Completed a 150-hour Data Science Diploma covering Python, ML, Deep Learning, Mathematics, and Software Engineering; graduated with 90%.