

Mahmoud Yahia Ahmed

AI & Machine Learning Engineer | Generative AI, RAG Systems & Scalable ML Solutions

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Profiles

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Summary

AI / Machine Learning Engineer with proven experience building and deploying production-grade ML and Generative AI systems across NLP, computer vision, and RAG-based architectures. Delivered scalable solutions used in real business environments, improving automation, decision-making, and operational efficiency through cloud-native AI systems on AWS and Azure.

Experience

Advansys -ForteCloud [Oct 2023 - Present]

Cairo, Egypt

Machine Learning Engineer

- Developed AI-powered solutions across NLP, computer vision, and Generative AI, delivering scalable applications in HR tech and enterprise automation.
- Designed and deployed end-to-end ML pipelines, from data preprocessing to production-level deployment using AWS services (Bedrock, OpenSearch, Lambda, S3, DynamoDB).
- Spearheaded the creation of a document-based chatbot using Retrieval-Augmented Generation (RAG), integrated with Microsoft Teams to enhance internal knowledge management.
- Developed image compliance systems for passport photo validation, incorporating blur detection, pixelation checks, face alignment, and white background verification using OpenCV, Dlib, and Mediapipe.

Route Training Center [July 2023 - Jan 2025]

Head of Ai & Instructor

- Designed and led a market-aligned AI curriculum focused on applied ML, NLP, computer vision, and LLM-based systems.
- Mentored and supervised 150+ students and junior engineers, enabling delivery of real-world AI projects and improving job-readiness.
- Guided capstone projects emphasizing problem formulation, model deployment, and business impact.

Microsoft [Sep 2022 - Feb 2023]

Cairo, Egypt

Applied NLP

- Developed a Named Entity Recognition (NER) system for Egyptian Arabic dialects using deep learning.
- Built data labeling, augmentation, and training pipelines using Hugging Face Transformers and spaCy.
- Improved entity extraction accuracy from noisy transcriptions using phonetic similarity and post-processing heuristics.

Up Work [Feb 2021 - Jan 2022]

Freelancer

- Delivered over 10 successful ML projects in computer vision, time-series forecasting, and NLP for global clients.
- Built custom image classification models, OCR pipelines, and sentiment analysis systems tailored to client business needs.
- Collaborated across time zones to deploy models using Flask, FastAPI, and Docker on cloud platforms (AWS, GCP).

Projects

Passport & Government ID Image Validation System

High-Scale AI System | ~15K Requests/Day

- Built a computer vision system handling ~15K requests/day to validate passport and ID images against ICAO standards.
- Automated checks for face alignment, white background, shadows, sharpness, pixelation, and cropping.
- Deployed on AWS EC2 using MediaPipe and OpenCV.

AWS EC2, Streamlit, Mediapipe

Complaint Analysis & Sentiment Intelligence Platform

- Engineered an end-to-end system to classify, cluster, and summarize customer complaints at scale.
- Applied AWS Comprehend for sentiment analysis and AWS Bedrock for generative summaries.
- Delivered actionable insights for customer support teams.

Streamlit, AWS Comprehend, AWS BedRock

Enterprise RAG Chatbot (HR & Policy Assistant)

- Developed a domain-specific RAG chatbot using AWS Bedrock and OpenSearch.
- Enabled semantic document retrieval and question answering inside Microsoft Teams.
- Improved employee self-service and reduced HR operational load.

AWS Bedrock, AWS OpenSearch, Microsoft Teams Toolkit

NER on contemporary spoken Egyptian Arabic

- Built and fine-tuned BERT-based NER models for noisy spoken Arabic data.
- Contributed to NLP resources for underrepresented dialects.
- Used spaCy, Stanza, and transformer-based architectures.

NER, Spacy, Stanza, NLP, BERT, Pretrained models

Education

Ottawa University of Canada [Feb 2022 - Feb 2023]

Professional Master of Electrical and Computer Engineering

Grade : 9.7

AlAhram Canadian University [Sep 2016 - July 2020]

B.Sc. in Computer Science

Grade : 3.27

Certifications

Azure AI Engineer Associate

Microsoft

May 2025

AWS Certified AI Practitioner

AWS

July 2025

Azure Data Scientist Associate

Microsoft

April 2025

Artificial Intelligence Analyst

IBM

April 2022

Big Data

IBM

March 2022

Predictive Analytics Modeler

IBM

Feb 2022

Business Acumen

Dale Carnegie

July 2022

Skills

Programming

Java, Python, SQL, C, C++

Data Science

Machine/Deep learning, Sklearn, Keras, TF, Data Visualization, Data Analysis, Pandas, Numpy, Numba, Streamlit, Flask

Software Engineering

DS, Algorithm, Problem solving, SW design, SQL, Sprints

Hands On

AWS Services, GCP, Docker, Azure Machine Learning, GitHub, Deployments, Developing

AI/ML Frameworks

LangChain, LangGraph, Autogen

Cloud & DevOps

AWS (Bedrock, ECS), Docker, CI/CD Pipelines, Cloud Deployment & Management

LLM

Model Evaluation, Fine-tuning (LoRA, QLoRA, PEFT), Model Optimization (Quantization, Distillation), Data Scraping, Data Annotation, Named Entity Recognition (NER), Text Analysis, Computer Vision, Conversational AI Chatbots, Custom AI Tools, Agent-based Automation, RAG with Vector Databases, Vector Databases (Pinecone, ObjectBox, ChromaDB, Weaviate)

Languages

English

Arabic