

Yousef Mamdouh

AI/ML Engineer | Software Engineer

LLM Systems · RAG · Machine Learning · Backend · Software Architecture

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PROFESSIONAL SUMMARY

Software engineer specializing in AI/ML systems, with hands-on experience building LLM and RAG applications, fine-tuning pipelines, computer-vision solutions, backend APIs, and modular software architectures. Experienced in R&D delivery, codebase refactoring, QA, reproducible experimentation, and Agile execution. Builds independent AI systems including KRONOS, AutoFT, and GUARDIAN RAG, combining software engineering with applied AI.

PROFESSIONAL EXPERIENCE

AI/ML Engineer — R&D Execution & Team Lead

YOUXEL Technology | AI Innovation Department | Oct 2025 – Jun 2026 | Remote

- Led parallel AI/ML R&D tracks from experimentation through documented, production-oriented delivery.
- Architected a RAG security approach covering threat modeling, retrieval-poisoning mitigations, and guardrails for adversarial inputs.
- Engineered an autonomous LLM fine-tuning workflow that monitors model performance, detects data drift through statistical testing, and triggers retraining and redeployment.
- Prototyped a cloud fine-tuning service with self-service workflows, live cost estimation, and training monitoring.
- Implemented an AI-agent quality layer covering 30+ quality rules across 7 categories, combining deterministic heuristics with LLM-based analysis and feedback-driven improvement proposals.
- Contributed to computer-vision R&D for sports analytics, including video-based movement detection and analysis.
- Refactored a core AI engine to separate tightly coupled components, improving modularity, maintainability, QA, and reproducibility.
- Analyzed the architecture of a core AI codebase and translated identified modularization opportunities into product-roadmap recommendations.
- Mentored 1 junior R&D team member, reviewed technical deliverables, coordinated Jira sprint execution, and maintained repository documentation.

Business Data Analyst / Junior Software Engineer

GIG Egypt Life Takaful | Mar 2025 – Oct 2025 | Cairo, Egypt

- Led a digital-transformation initiative using Jira Service Management and custom add-ons to support dynamic business requirements.
- Automated business workflows with ScriptRunner HAPI/Groovy, reducing manual operational steps.
- Translated business and technical requirements into structured documentation and executable workflow designs.
- Built and maintained BI dashboards and recurring reports to support data-driven decisions across departments.
- Managed project data sources and analyzed processes across multiple business workflows.

Backend Developer Intern

GIG Egypt | Sep 2023 – Oct 2023 | New Cairo, Egypt

- Implemented a Laravel/MySQL CRUD REST API for customer invoice management, including RESTful endpoints, database operations, and request handling.
- Completed an intensive backend program covering Laravel, API architecture, and HTTP request handling.

SELECTED PROJECTS

KRONOS _ Local-First Multi-Agent AI Platform

Independent Project

- Designed a local-first platform for visual DAG-based multi-agent orchestration, hybrid RAG, and agent-specific LoRA fine-tuning from run history.
- Built the application with Python/FastAPI, Next.js/TypeScript, Qdrant, DuckDB, hybrid search, LangGraph, and PEFT.

AutoFT _ Self-Maintaining LLM Agents

Independent Project

- Built an automated fine-tuning workflow that detects model drift, retrains agents with QLoRA on a single consumer GPU, and evaluates candidate models against the deployed baseline before promotion.
- Stack: PyTorch, Transformers, Hugging Face, PEFT/QLoRA, Ollama, FastAPI, Streamlit.

GUARDIAN RAG _ Secure, Role-Aware Enterprise Retrieval

Independent Project

- Built a self-hosted RAG system for enterprise policy documents with role- and clearance-aware retrieval, source citations, and auditable query trails.
- Stack: PostgreSQL, pgvector, HNSW, embeddings, semantic chunking, FastAPI, Ollama, RBAC/ABAC.

Sport Performance Analyzer _ AI Movement Analysis

Independent Project

- Built a sports-analysis platform that compares athlete movement with reference video using pose estimation, motion normalization, temporal alignment, and scoring to identify technique weaknesses.

Nest Invest _ AI-Powered Stock Market Simulator

Graduation Project — Grade A

- Developed a MERN-based stock-market simulation platform integrating a separate Python LSTM forecasting service.
- Owned the AI component: historical data collection, preprocessing, look-back sequences, training and validation, and evaluation using RMSE, MAE, and MAPE.

TECHNICAL SKILLS

Software Engineering: Python, JavaScript, TypeScript, PHP, OOP, Design Patterns, Software Architecture, Code Refactoring, Modularization, REST APIs, Git

AI / Machine Learning: PyTorch, LSTM, Scikit-learn, NumPy, pandas, Deep Learning, Computer Vision, Pose Estimation, Model Evaluation

LLM / AI Systems: RAG, LLM Fine-Tuning, QLoRA, PEFT, LoRA, Embeddings, Semantic Search, LLM Evaluation, Ollama

Backend / Web: FastAPI, Flask, Laravel, Node.js, Express.js, React, Next.js, MongoDB, MySQL, PostgreSQL

Data / Retrieval: SQL, PostgreSQL, MySQL, DuckDB, Qdrant, pgvector, Vector Search, Hybrid Search

Engineering / Delivery: Jira, Confluence, ScriptRunner, HAPI/Groovy, QA, Reproducible Experimentation, Agile/Scrum

EDUCATION

B.Sc. Computer Science — Major: Data Science | Canadian International College (CIC), Cairo | 2020 – 2024

CERTIFICATIONS AND TRAINING

GIG Egypt — Backend Development: Laravel, PHP, RESTful APIs, MySQL | Coach Academy EG — Problem Solving & Competitive Programming (C++)