

# Eslam Ashraf Elsawy

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## SUMMARY

AI Engineer and Computer Science graduate, specialized in building end-to-end AI solutions. Core expertise includes RAG pipelines, LLM fine-tuning (LoRA), speech technologies (STT/TTS) for Arabic and English, and Microsoft Azure Cognitive Services. Experienced in developing production-ready systems with FastAPI, vector databases, and multimodal AI. Solving real-world business problems for government and enterprise clients, demonstrating strong technical execution and stakeholder management. Focused on deploying low-latency, MLOps, and scalable solutions with measurable business impact.

## EDUCATION

**Faculty of Computers and Artificial Intelligence, Benha University**  
*Bachelor's Degree in Computer Science. - Grade: Very Good with Honors.*

**Benha, Al-Qalyubia, Egypt**  
*Sep. 2018 - Jul. 2022*

**Diploma in AI, Data Science, and Cloud Computing**

*Digital Egypt Builders Initiative (DEBI), Ministry of Communication*

**Hybrid, Egypt**  
*Jan 2024 - Dec 2024*

- Completed an Intensive program covering Machine Learning, Deep Learning, NLP, Computer Vision, Cloud Computing, and MLOps.

## WORK EXPERIENCE

**AI Engineer**

*(Freelance)*

**Remote**  
*Dec 2024 - Present*

- Delivered end-to-end AI solutions for tourism and enterprise clients, managing full project lifecycle from requirements gathering to deployment and client training.
- Architected scalable backend systems using FastAPI and Redis, supporting 100+ concurrent users with sub-3-second response times across multiple platforms.
- Developed multilingual conversational AI with Azure Cognitive Services (Text Analytics, Translator, Speech) supporting Egyptian Arabic dialect and English.
- Integrated omnichannel messaging platforms (WhatsApp, Facebook Messenger, Instagram) using Meta Graph API webhooks for real-time customer engagement.
- Applied LLM fine-tuning techniques (Llama 3) and implemented custom STT/TTS pipelines optimized for Arabic language processing.

**AI Developer (Team Lead) – EduVision AI Platform**

*Ministry of Communications and Information Technology (MCIT)*

**Remote, Egypt**  
*Nov 2024 - Mar 2025*

- Led cross-functional team to design and implement government digital transformation solution, coordinating technical development and stakeholder communication.
- Managed end-to-end ML pipeline from data collection to Azure Cloud deployment, ensuring on-time delivery for MCIT demonstration.
- Applied advanced AI techniques including multimodal fusion (video, audio, text), model fine-tuning, and performance optimization achieving 40% processing time reduction.
- Conducted technical benchmarking across multiple AI models (Gemini, Llama, Qwen) to optimize cost-performance ratio, securing startup prototype recognition.

**AI Engineer (Internship - Team Lead)**

*National Bank of Egypt (NBE)*

**Remote, Egypt**  
*July 2024 - Oct 2024*

- Led development team to create production-ready AI tool for financial data analysis, managing technical implementation and quality assurance.
- Designed hybrid AI architecture combining computer vision and NLP for automated data extraction and intelligent query processing.
- Implemented voice-enabled features with Azure TTS supporting bilingual output (Arabic/English) for enhanced user accessibility.
- Delivered desktop application deployed across banking terminals, achieving 60% reduction in analyst review time.

## CORE COMPETENCIES

Generative AI • Large Language Models • LLM Fine-tuning • RAG Systems • Azure AI Services • MLOps • FastAPI • NLP • Computer Vision • Speech Technologies (STT - TTS) • Vector Databases • Multimodal AI • Docker • CI/CD • Model Deployment • API Development

## PROJECTS

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- **EduVision: Multimodal AI Performance Evaluation System - MCIT** [\[link\]](#):

- **Overview:** Led team to build multimodal AI system for the Ministry of Communications analyzing video, audio, and text to generate performance evaluation reports. Recognized by MCIT as startup prototype for innovation in government digital transformation.

- **Key Contributions:**

- Built end-to-end pipeline combining computer vision (OpenPose, MediaPipe), speech analysis (Whisper, Praat), and NLP (spaCy, LanguageTool).
- Fine-tuned Llama 3 and Qwen-VL for automated report generation with 90%+ accuracy across 100+ sessions.
- Optimized Azure deployment reducing processing time by 40% and achieving 30% cost reduction through model comparison.

- **Impact:** Reduced evaluation time by 70% and improved assessment consistency for HR decision-making.

- **Technologies:** Python, PyTorch, OpenPose, MediaPipe, Whisper, Praat, spaCy, Llama 3, Qwen-VL, Gemini 2.0 Flash, Azure, FastAPI, Docker.

- **Smart Tourism Assistant: RAG-Powered Omnichannel Chatbot:**

- **Overview:** Built complete backend for intelligent tourism chatbot using RAG architecture, handling multi-turn conversations across WhatsApp, Messenger, Instagram, and Web platforms.

- **Key Contributions:**

- Built RAG system using ChromaDB with 92% retrieval accuracy (1000+ chunks) and HuggingFace reranking.
- Implemented multilingual NLP with Gemini 2.5 Flash for Egyptian Arabic and English intent detection.
- Created FastAPI gateway handling 100+ concurrent requests with Redis and integrated Meta APIs for omnichannel support.

- **Impact:** Achieved 95% satisfaction, 80% faster response time, and handled 70% of inquiries autonomously.

- **Technologies:** Gemini 2.5 Flash, LangChain, ChromaDB, HuggingFace, FastAPI, Meta APIs, Redis, Docker, Python.

- **Financial Dashboard Auto Transcript Analyzer - using Gen-AI "NBE"** [\[link\]](#):

- **Overview:** Led team in developing a Gen-AI-powered analytics tool to analyze financial dashboards, extract embedded data from chart images, and generate human-like textual and audio summaries with intelligent query responses.

- **Key Contributions (as Team Lead):**

- Deployed Vision Transformers (Donut) achieving 85%+ accuracy in extracting numerical data from 500+ complex financial charts.
- Built intelligent Q&A system combining FAISS vector search with GPT-NeoX-20B for contextual financial analysis using RAG-inspired architecture.
- Integrated Azure TTS (Text-to-Speech) and Translator for multilingual voice output (Arabic, English) with custom number-to-text conversion for Arabic.
- Developed FastAPI microservice deployed via ngrok, and PyQt5 desktop application with screen capture for seamless user interaction.
- Coordinated development workflow and ensured delivery for internal banking operations.

- **Impact:** Reduced financial analyst review time by 60%, processed 500+ chart collections, and enabled faster decision-making for banking operations.

- **Technologies:** Transformers (Donut, DonutProcessor, VisionEncoderDecoderModel), FAISS, GPT-NeoX-20B, FastAPI, Azure Cognitive Services (TTS, Translator), PyQt5, Pyngrok, Pillow, Torch, Python.

## COURSES AND CERTIFICATES

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- Stanford Machine Learning Specialization.
- Deep Learning Specialization.
- MLOps Tools: MLflow and Hugging Face.
- Generative AI with Large Language Models.
- Introduction to Agile Development and Scrum (IBM).
- Cloud Computing Foundations.
- Cloud Virtualization and Containers and APIs.
- Azure Certifications:
  - \* Microsoft Certified: Azure AI Engineer Associate (AI 102) - Earned August 2025 [\[View\]](#).
  - \* Azure Data Scientist Associate (DP 100) - Course Completed.

## TECHNICAL SKILLS

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**Programming Languages:** Python (Advanced); working knowledge of C++ & Java.

**Generative AI & LLMs:** GPT-4o, Gemini, Llama 3 (Fine-tuning), LangChain, RAG (Retrieval-Augmented Generation), Prompt Engineering, Model Optimization.

**Machine Learning & Deep Learning:** PyTorch, TensorFlow, Keras, Scikit-learn, XGBoost, Transformers (BERT, GPT), CNNs, RNNs, Transfer Learning, Model Fine-tuning.

**Natural Language Processing:** spaCy, NLTK, Hugging Face, Text Classification, Sentiment Analysis, Named Entity Recognition.

**Computer Vision:** OpenCV, OpenPose, MediaPipe, YOLO, Vision Transformers, Image Classification, Object Detection.

**Speech Technologies:** Speech-to-Text (Whisper, Azure Speech), Text-to-Speech (Azure Neural TTS), Audio Processing (Praat, librosa).

**Cloud Platforms:** Microsoft Azure (Cognitive Services, App Service, Functions, Blob Storage, Azure OpenAI).

**Vector Databases:** FAISS, ChromaDB, Pinecone, Qdrant (for similarity search and RAG pipelines).

**Backend Development:** FastAPI, Flask, Django, REST APIs, WebSocket, Async Programming, Redis, Celery.

**ERP & Business Automation:** Odoo API Integration (XML-RPC/JSON-RPC), Custom Module Development, ORM.

**Databases:** MongoDB, PostgreSQL, MySQL, Oracle.

**GUI & Dashboards:** Tkinter, PyQt5, Streamlit, Responsive Design.

**DevOps & Tools:** Docker, Git, GitHub, Redis, Selenium, CI/CD Pipelines, MLflow, Hugging Face Hub, Model Deployment, PowerShell, Bash Scripting.

**Mathematics & Foundations:** Linear Algebra, Probability, Hypothesis Testing, OOP, Data Structures, Algorithms.

## LANGUAGES

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- Arabic: Native
- English: Professional Working Proficiency

## PERSONAL INFORMATION

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- Military Status: Exempted