

SUMMARY

A passionate and results-driven Data Scientist and AI Engineer with a strong foundation in machine learning, AI, and data analysis. Graduated with a Bachelor’s degree in Computer Science and Artificial Intelligence from Nile University. Experienced in working with large language models (LLMs), computer vision, and natural language processing (NLP) techniques. Adept at leading technical teams, managing projects, and deploying AI solutions in production environments. Known for strong problem-solving ability, collaboration skills, and commitment to continuous learning in cutting-edge technologies.

EDUCATION

**Bachelor of Computer Science & Artificial Intelligence**, Nile University Graduated: Jun 2025  
CGPA: 3.6

Relevant Coursework: Artificial Intelligence, Machine Learning, Databases, Software Development, Data Analysis, Mathematics

Student Activities:

- ITCS School’s Representative**, Nile University Students’ Union Aug 2023 – Mar 2024  
Addressed student concerns for over 1000 peers and led initiatives to enhance student life.
- Junior Member**, ICPC NU Community Oct 2022 – Jun 2024  
Participated in the Egyptian Collegiate Programming Contest (ECPC).
- Technical Member**, IEEE NU Student Branch Oct 2022 – Oct 2023  
Organized workshops on AI and machine learning and contributed to engineering projects.

SKILLS

**Technical Skills:** Python, C/C++, Java, SQL; CUDA, PyTorch, TensorFlow, Keras, Scikit-learn, GANs

**Advanced Skills:**LLMs, Retrieval-Augmented Generation (RAG), NLP

**Soft Skills:** Presentation, Team Management, Project Management, Communication

**Other:** Research, Report Writing, Public Speaking

TECHNICAL EXPERIENCE

**LLM Freelancer – Part-Time** Apr 2025 – Present  
*Digis Squared, Remote*

- Deployed large language models in production using CPU-optimized techniques and GPU acceleration via CUDA.
- Fine-tuned open-source LLMs for tasks such as summarization, classification, and conversational AI.
- Built lightweight, locally deployable pipelines for environments with limited compute resources.

**DEMI Coding Instructor – Part-Time** Jun 2024 – Present  
*iSchool – Cairo & Giza, Egypt (Remote & On-site)*

- Specialized in teaching programming and AI basics to children in both remote and on-site settings.
- Conducted engaging tutoring sessions and adapted teaching styles based on age and skill level.
- Focused on interactive learning using Pictoblox and real-world AI examples for young learners.

**AI Engineer, Team Lead – LLM Team** Jul 2024 – May 2025  
*Singularity, Cairo, Egypt*

- Lead the LLM team, managing task delegation, tracking progress, and ensuring project timelines.
- Applied computer vision for object detection and segmentation in steel factory environments.
- Fine-tuned LLMs and implemented Retrieval-Augmented Generation (RAG) for advanced information retrieval.
- Built a digital twin using NVIDIA Omniverse for real-time production monitoring.

**Junior Teaching Assistant** Oct 2022 – Jun 2023  
*Nile University ITCS School, Giza, Egypt*

- Assisted in Discrete Mathematics instruction for over 180 students.
- Led tutoring sessions and supported grading and academic inquiries.

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# Mohamed Osama

## Data Scientist / AI Engineer

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## PROJECTS

### **PRISMA-Based MARL Review Paper Companion** – [github.com/MOsama10/prisma-marl-review](https://github.com/MOsama10/prisma-marl-review)

Technologies: Python, Jupyter, SciPy, Matplotlib, Pandas, Zotero

Developed a companion codebase for a systematic review paper on Multi-Agent Reinforcement Learning (MARL) based on PRISMA guidelines. Includes data extraction, visual analysis, and reproducible insights for MARL literature trends.

### **RAG\_Project** – [github.com/MOsama10/RAG\\_Project](https://github.com/MOsama10/RAG_Project)

Technologies: RAG, PyTorch, Hugging Face, FastAPI

Developed a local Retrieval-Augmented Generation system for enterprise-grade QA with schema-aware logic and local deployment using FastAPI.

### **Katana NLP-to-SQL Platform** – [github.com/MOsama10/katana-nlp-to-sql](https://github.com/MOsama10/katana-nlp-to-sql)

Technologies: FastAPI, PostgreSQL, SQLCoder (GGUF), llama.cpp

Built a fully offline NLP-to-SQL system for Katana telecom analytics. Converts English queries into SQL using domain-aware logic and dynamic schema handling.

### **Hieroglyphic Translation to English** – [github.com/MOsama10/Hieroglyphic-translation-to-English](https://github.com/MOsama10/Hieroglyphic-translation-to-English)

Technologies: Python, Transformers, Vision Models, Hugging Face

Designed a CV-NLP pipeline that detects and translates ancient Egyptian hieroglyphics into English using transformer-based models.

### **Production to Instruction** – [github.com/MOsama10/production-to-instruction](https://github.com/MOsama10/production-to-instruction)

Technologies: PyTorch, LLMs, NLP, Prompt Engineering

Transformed raw production logs into human-readable instructions using large language models and prompt engineering for enhanced operational clarity.

### **Speech-to-Speech Translation System** – [github.com/MOsama10/Speech-to-Speech](https://github.com/MOsama10/Speech-to-Speech)

Technologies: XTTS, PyTorch, Whisper, FastAPI, Hugging Face

Built an end-to-end speech-to-speech translation pipeline using Whisper for ASR and XTTS for TTS. Integrated with FastAPI for local deployment, enabling seamless voice translation across multiple languages.

### **AgriCash Avatar Speech-to-Speech Guide**

Technologies: PyTorch, CUDA, Advanced RAG, FastAPI, Hugging Face Transformers (XTTS)

Built an interactive avatar guiding users through the AgriCash app using XTTS, CUDA, and advanced RAG.

### **Production Chatbot for Manufacturing**

Technologies: PyTorch, CUDA, Advanced RAG, FastAPI

Built a locally deployed chatbot for production QA, supporting queries on material codes and component data.

### **Crypto Stock Market Analysis**

Libraries: Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn, PyTorch

Predicted cryptocurrency price changes using statistical and ML techniques.

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## PUBLICATIONS

- **Osama, M.**, Mamdouh, D., Attia, M., Mohamed, N., Lotfy, A., Arafa, T., Rashed, E.A., & Khoriba, G. (2025). *Advancements in Radiology Report Generation: A Comprehensive Analysis*. **Bioengineering**, 12(7), Article 693.  
<https://www.mdpi.com/2306-5354/12/7/693>

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## ACHIEVEMENTS

- 3rd Place – IEEE Helwan RAS Auxillio 6.0 (Robotics Manufacturing 2023)
- 2nd Place – IEEE Helwan RAS Auxillio 5.0 (Robotics Manufacturing 2022)
- Full Scholarship – Nile University ITCS School (2021)