

Professional Summary

Final-year Computer Engineering undergraduate with an immense passion for AI. I enjoy the idea of connecting theoretical foundation to real-world applications and have many "aha" moments as I learn about new technologies and innovative solutions.

Education

Arab Academy for Science and Technology - Faculty of Engineering SEP. 2020 – JUN
Bachelor in Computer Engineering – GPA: 3.6/4.0 ([Student Transcript Link](#))
• **Related Coursework:** Introduction To Artificial Intelligence, Neural Networks, Image Processing and Pattern Recognition

Projects

These are some of the projects not all of them. You can find the rest on my Github: [MHamdyK](#)

• AI Model Development for En2ly (Startup Application)

Integrated a multi head AI model (**Classification** and **Regression** heads) into the backend of a startup application to classify and estimate the dimensions of house furniture. Trained on the **Bonn Furniture Styles Dataset** (90k images) and optimized locally on a RTX 3060 GPU.

- Converted the model to **ONNX** and **TFLite** for efficient real-time integration, streamlining furniture categorization and dimension estimation.
- **Fawry Competition (On-going) | 2 Month Duration | Phase 1 | Qualified**
 - **Face Identification Project:**
Developed a deep learning-based face **Re-Identification** system to identify Fawry's staff members.
 - Fine-tuned an **InceptionResNetV1** (pretrained on VGGFace2) with a custom **ArcMarginProduct** layer, achieving **90% validation accuracy**.
 - Engineered custom **PyTorch** datasets with extensive data augmentation and applied **cosine similarity** on gallery embeddings for accurate staff identity matching.
 - **Multi-Object Tracking Project:**
Developed a complete pedestrian tracking system for Fawry branches.
 - Constructed a MOT pipeline using the **MOT20 dataset** with **YOLOv8** for pedestrian detection and ByteTrack for real-time tracking, achieving a **65% HOTA** score under challenging conditions.
 - Customized model training with careful hyperparameter tuning (**SGD** with **cosine learning rate decay**) and robust safe bounding box conversion with annotation validation across datasets.
- **End-to-End Arabic ASR with Wav2Vec2 XLS-R**
 - **Pretrained & fine tuned** on **80K+** Arabic audio samples (30K synthetic + 50K real) for dialect adaption.
 - Built a **production ready pipeline**: 16kHz resampling, diacritic free normalization, custom CTC vocab & dynamic padding.
 - **Optimized Wav2Vec2**: froze feature extractor, resized CTC head, trained in **FP16** on P100 GPU, achieved low **WER** and saved reusable checkpoints

Courses & Certificates

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| • DEPI (Digital Egypt Pioneers Initiative) - Google Data Analyst Specialist | OCT. 2024 - Present |
| • Embedded Systems Engineer – AMIT Embedded Systems Course
(Scholarship by Orange) Certificate Link | SEP. 2024 |
| • Machine Learning Specialization (Coursera) | MAY. 2024 |
| • Zero to Mastery Learn PyTorch for Deep Learning , (Udemy) | JAN. 2024 |
| • Internet of Things IoT – Information Technology Institute(ITI) IOT Certificate Link | SEP. 2022 |

Technologies

Languages: Python, C++, C, C#, Java, Assembly x86, VHDL, Verilog, SQL.

Skills: PyTorch, TensorFlow, LangChain, Git, Github, Linux, Tableau, Power BI, Vector Database, Data structure, Algorithms, Microcontrollers, QGIS.