Cairo, Egypt
Linkedin: **mohamdyk**

Mohamed Hamdy

Portfolio: https://mhamdyk.github.io/

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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 Egyptian 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

- **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.