Cairo, Egypt
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Mohamed Hamdy

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

Competitions & Achievements

- **MTC-AIC: Egypt National Artificial Intelligence Competition (**Phase II Finalist, **Top 6/200+)**
  - Engineered and benchmarked end-to-end classification pipelines for two distinct Brain-Computer Interface (BCI) paradigms: **Motor Imagery (MI)** and **Steady-State Visual Evoked Potentials (SSVEP)** using raw EEG data.
  - Implemented a wide range of advanced models, from classic signal processing (**CSP, Riemannian Geometry**) to state-of-the-art deep learning architectures (**ShallowConvNet, Transformers**), and robust feature-based models (**XGBoost** with tsfel features).
  - Optimized models for real-world application, focusing on generalization to unseen data and computational efficiency (**Real-Time Factor**) in preparation for a live, low-latency BCI simulator challenge.
- **Fawry AI Rising Gen Competition (Top 8/150+)** [Project Hub]
  - **Face Re-Identification:** Fine-tuned **Inception-ResNet-V1** with an **ArcMarginProduct** layer to build a face identification system for Fawry's staff, achieving **92% validation accuracy**.
  - **Pedestrian Multi-Object Tracking (MOT):** Delivered a real-time tracking pipeline using **YOLOv8** for detection and **ByteTrack** for data association, achieving **63% HOTA** on the MOT20/17 dataset.

Education

Arab Academy for Science and Technology - Faculty of Engineering **SEP. 2020 – JUN 2025**
Bachelor in Computer Engineering – **GPA:** 3.6/4.0 (Student Transcript Link)

- **Related Coursework:** Introduction To AI (A+), Neural Networks (A+), Image Processing and Pattern Recognition (A+)

Projects

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

- **End-to-End Egyptian ↔ English Speech Translator** [Web UI (Netlify) | Live Demo (HF Space)]
  - **Real-time web app:** fine-tuned **Whisper-small ASR** (WER 63.5 → 36.1 %, –43 %), fine-tuned **MarianMT** EN ↔ AR (37.5 BLEU), and **trained a char-level Transformer TTS from scratch** (3.7 MOS).
  - Curated 138 h dialectal audio + 63 k parallel sentences; **mixed-precision A100** training, 40 × LR down-scaling, **zero-OOV tokenizer.**
  - Productionised with **FastAPI** + **Uvicorn** backend and **React/TypeScript (Vite + Tailwind)** front-end; **Hugging Face Spaces** + **Netlify** deployment, < 4 s end-to-end latency on GPU.
- **ContribNavigator - AI Open-Source Onboarding Agent | MCP Hackathon** [GitHub/HF Space/Certificate]
  - Developed an AI-powered agent that accelerates open-source contributions by intelligently finding beginner-friendly issues and automatically generating a comprehensive onboarding guide.
  - Architected and built an end-to-end AI agent using **Python** and **Gradio**, where an **OpenAI API (GPT-4o)** model acts as a reasoning engine to dynamically plan and generate tailored onboarding kits for developers.
  - Engineered a multi-service backend leveraging the **GitHub API** for issue discovery and **Modal** for secure, **Docker**-based code analysis, delivering AI insights that significantly reduce contributor research and onboarding time.
- **SadaCall – Autonomous Cold-Calling Agent MVP (2025).** Whisper private Notebook *(please do not share)*
  - **Egyptian Arabic ASR Fine-Tuning:** Slashed WER from 63.5% to 36.2% by adapting Whisper-small on an 80h private dataset, using bfloat16+TF32 for a 1.6x throughput increase on an A100 GPU
  - **End-to-End Voice Agent:** Engineered a fully automated cold-calling agent using a Whisper STT -> CRAG (LangChain + ChromaDB) -> FishSpeech TTS -> Twilio dialer pipeline.
  - **Delivery:** Private **Gradio** demo Space with record/upload interface for instant call playback and transcript review.
- **End-to-End Egyptian Arabic ASR with Wav2Vec2 XLS-R** [GitHub]
  - **Pretrained & fine-tuned** on **80K+** Arabic audio samples (30K synthetic + 50K real) for dialect adaption.
  - **Built a full 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, achieving 49% WER and saved reusable checkpoints.

Courses & Certificates

- **Dr Mostafa Saad CSkilled Python DSA course** — **APR. 2025 - Present**
- **DEPI** (Digital Egypt Pioneers Initiative) - Google Data Analyst Specialist Certificate Link — **OCT. 2024 – March 2025**
- **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++, Java, SQL.
Skills: PyTorch, TensorFlow, TFlite, ONNX, LangChain, LangSmith, CrewAI, Vector Database, HuggingFace, LLMs, Git, FastAPI, Github, Linux, OpenAI API, Data structure, Algorithms, Tableau, Power BI, Microcontrollers, QGIS, EEG, SQL, TCP/IP, Wireshark.