Mahmoud LIMAM.

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🌐 https://www.kaggle.com/mahmoudlimam

Employment History

12/2023 – Present

🔖 **AI Research Engineer,** Digital Research Center of Sfax.

- Optimizing scene-text image generation (in both the Arabic and Latin scripts): Experimented with several Diffusion-based approaches including model blending, patch-wise generation, different types of conditioning and different training methods.

- Implemented and adapted several visual and multi-modal architectures (such as Donut, ViTLP, LayoutLMv3 etc..) for invoice information extraction and layout analysis.

09/2023 – 01/2024

🔖 **Data Science Consultant.**

Some tasks I've worked on:

- Implemented an LLM in a RAG system on a local server for a cybersecurity company. (LangChain & FastAPI)

- Scraped, Cleaned and Analysed E-Commerce data, and built a mini-app for data filtering.

- Implemented a Reinforcement Learning approach for gateway load balancing.

09/2022 – 08/2023

🔖 **AI intern,** Digital Research Center of Sfax.

- Layout analysis/segmentation on document images using Object Detection & Multi-Modal Models.

- Studied the capabilities of GANs & Diffusion Models in generating realistic document images.

- Contributed to the creation of a dataset of synthetic invoice images using image processing techniques.

07/2022

🔖 **AI intern,** Revampr.

- Implemented deep learning-based approaches for the localization/segmentation of handwritten text at different rotation angles.

- Created a process for generating artificial image data with structured text using image processing.

10/2021 – 05/2022

🔖 **Instructor of Machine Learning & Data Science,** GDSC Enet'Com.

Delivered +20 workshops on Data pre-Processing, Exploratory Analysis, Descriptive Statistics, Dimensionality Reduction, Resampling, Tree-Based Models, Text Classification, Topic Modelling, Outlier Detection, Clustering methods, etc..

07/2021 – 08/2021

🔖 **AI intern,** Pixemantic.

- Diagnosis of Diabetic Retinopathy in medical images (imbalanced multiclass classification).

- Trained a CRNN model to recognize handwritten text in images.

Education

2020 – 2023

🔖 **Engineering Diploma - Masters of Engineering, Data and Decision Systems**

Ecole Nationale d'Electroniques et de Télécommunications (Enet'Com).

Thesis title: *Applications of Multi-Modal and Diffusion Models in Document Processing and Generation.*

2017 – 2020

🔖 **Pre-Engineering., Math and Physics**

Institut Préparatoire aux Etudes d'Ingénieurs de Tunis (IPEIT).

Some of my Personal Projects

Brain Tumor Segmentation on MRI Images
I experimented with different U-Net variants (including a multi-modal one) to segment brain tumors in MRI images.
Link

Linguistics RAG
Created an Expert in Linguistics using Agentic RAG. (LlamaIndex & Ollama)
Link

Local Deployment of a Machine Learning Model.
I deployed a classifier on a local server using FastAPI for Backend, Streamlit for Frontend, Docker for Containerization, DagsHub and DVC for Version Control and MLFlow for Experiment Tracking.

Statistical Analysis & Modeling of Kidney Disease Data.
I conducted a thorough statistical analysis of Kidney Disease data and compared different modeling and clustering approaches.
Link

Studying Transformer Encoders as a Loss Function for Abstractive Self-Supervised Text Summarization
I designed and experimented with architectures to tackle the difficult problem of unsupervised abstractive text summarization.
Link

Simulation & Optimization of a Manufacturing & Sales Process.
I simulated a simplified process of manufacturing and sales using statistical/probabilistic modeling. I experimented with RL-based and rule-based agents for optimizing sales/profit.
Link

Machine Learning-Driven Discovery of Therapeutic Targets for Colorectal Cancer-Associated Pathogenic Bacteria.
I co-supervised an engineering student in a project dealing with CRC treatment by targeting bacteria associated with CRC progression.
Link

Skills

Machine/Deep Learning	I have been continuously working on ML and DL projects for the last 4 years. I've worked with tabular, image and text data.
Generative Models	I have been working with Generative Models for the past 2 years and have experimented with several optimization techniques in training and inference.
Multi-Modal Models	I have been working with Multi-Modal Models for the past 2 years in the context of Document Image Processing and Layout Analysis.
Languages	Native in Arabic, C2 in English, and B1 in French.

Certifications

2020   **IELTS Academic English Test 8.5/9 - C2**. Awarded by British Council.