Hatim Mrabet

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I am a final-year student seeking a 6-months internship opportunity in Artificial Intelligence starting from April 2025.

Experience

Inria **Lille, FR**
*Research Intern, **SCOOL** team* Apr 2024–Aug 2024

- Fine-tuning a word embedding model using contrastive learning techniques, inspired by **SimCLR** framework, to improve food classification models.
- Developing a Machine Learning model (**RandomForest**) to predict the Symptoms of IBS, given the diet followed by the patient.
- Developing a **bandit algorithm (UCB)** to propose the most adequate and efficient diet that must be followed by the patient to reduce the symptoms of IBS.

BNP Paribas **Paris, FR**
Data Science Intern Jul 2023–Jan 2024

- Developed machine learning pipeline for BII (Biodiversity Intactness Index) estimation. Tested regression models (**Linear regression, CatBoost, RandomForest**) for species abundance and regional similarity prediction.
- Constructed housing unit dataset and developed Machine Learning models (**Linear Regression, XGBoost, RandomForest**) for predicting energy performance diagnosis (DPE) based on unit features.

Education

Université Paris-Saclay : École CentraleSupelec- Engineering Degree **Paris, FR**
Master of Science - Mathematics and Data Science major 2021–2025
Coursework: Machine Learning, Computer Vision, NLP, Large Distributed Computing, RL, Advanced Probabilities, Optimization, Statistics, Partial Differential Equations, Algorithms and Data Structures, Object-Oriented Software Engineering.

ENS Paris-Saclay - Master MVA **Paris, FR**
Master of Science - Mathematics, Vision and Learning 2024–2025
Research-oriented master program.
Coursework: Introduction to Statistical Learning, Theoretical Foundations of Deep Learning, Convex Optimization, Machine Learning for Time Series, Learning Applied to Text and Graph Data, Computer Vision, Large Language Models (LLM)

Projects

Research project : Image segmentation of the Optic Nerve Sheath (few shots learning problem)

- Employed Deep Learning techniques (**ResNet and Unet**) for image segmentation and feature extraction.
- Utilized clustering methods (**HDBSCAN and Kmeans++**) for image classification.
- Used **Transfer learning** by training the decoder of a pretrained Unet on our dataset

Paintings Generator using GANs

- Developed and implemented **GAN models**, including a **U-Net-based discriminator** and a **U-Net decoder-based generator.**
- Trained models with **CutMix augmentation** and **consistency regularization** to improve feature learning.
- Evaluated and compared model performance across various datasets.

Movies Recommendation System using Bandit Algorithms

- Cleaned and preprocessed a movie ratings dataset, extracting features to enrich the data.
- Developed and compared **contextual bandit** algorithms based on **UCB** and **G-optimal design for exploration**, evaluating performance with varying feature sets and model arms.
- Implemented and assessed **three multi-armed bandit models (UCB, Thompson Sampling, EXP3)** across different setups by varying the number of arms.

Skills

Technical Skills: Python(Tensorflow,PyTorch,Keras,Scikit-learn, ChromaDB, Sentence-Transformers...),SQL,Java,Matlab.
Tools: VSCode, Eclipse, Git, Jupyter,Latex, Domino.
Languages: English (Fluent) | French (Fluent) | Arabic (Native)

Certificates

Coursera certificates : NLP Specialization, Deep Neural Networks with PyTorch . Sep 2023
Kaggle certificates : Feature engineering, Data visualization . July 2023