Mohammed El Barhichi

Graduate AI Engineering student seeking for an entry-level opportunity in AI starting in November 2025

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PROFESSIONAL EXPERIENCES

AI Engineer Intern   May 2025 – Oct 2025
Ampere Software Technology - Renault Group
- Design a Python/LangChain–based framework to validate and optimise LLM-powered **AI agents** for in-car conversational services, with metrics centred on robustness, coherence and user impact.
- Skills required**:** LangChain & LangGraph | OpenAI, Llama 2, Mistral APIs | RAG with FAISS/Chroma | prompt engineering & RLHF tuning

AI Software Engineer Intern   Apr 2024 – Aug 2024
E-voluciona by Intelcia
- Designed and developed personalized chatbots based on Retrieval-Augmented Generation (**RAG**) architecture for two major clients (demo ⧉).
- Implemented advanced techniques to enhance the chatbot's comprehension by applying Semantic Chunking, History-Aware Retriever, Multi-Query Retriever and Query-Decomposition, achieving 87% score in **answer relevancy**.
- Skills required : LLMs, **LangChain**, Azure, OpenAI, Claude, Embedding, Streamlit, LangSmith.

Data Scientist Intern   Jun 2023 – Sep 2023
Africa Verify
- Proposed and implemented an automated data extraction approach based on **NLP**, achieving a 95% time-saving in daily tasks.
- Skills required : BeautifulSoup, Selenium, Natural Language Processing (NLP), Named Entity Recognition (**NER**) , NLTK, Gradio.

EDUCATION

Engineering Degree in Artifical Intelligence Engineering   Sep 2024 – present │ Paris-Saclay
CentraleSupélec
Key Courses: Deep Learning, Reinforcement Learning, Multi-Agent Systems, Computeer Vision, Advanced Natural Language Processing.

Exchange Semester - Data-Driven Entrepreneurship   Jan 2024 – May 2024
ESSEC Business School
Key Courses: Data-driven Decision-Making, Coorporate Finance, Entrepreneurship & Innovation.

Engineering Degree in Data Science   Sep 2022 – Jan 2024 │ Casablanca
Ecole Centrale Casablanca
Key Courses: Probability, Optimization, Statistics, Programming, Machine Learning, Graph Theory, Modeling, Operations research.

RELEVANT PROJECTS

Streaming Pipeline for Jailbreak Detection - ML Engineering Project ⧉   Oct 2024 – Apr 2025
- Implemented a real-time, low-latency data pipeline for detecting jailbreak attempts on virtual assistants, utilizing **Apache Pulsar** for reliable message streaming, **Apache Beam**, and **Beam ML** for scalable data processing and integrated machine learning inference.
- Developed a dynamic **hot-swapping** mechanism for model updates without downtime, complemented by latency and performance monitoring.
- Skills required: Apache Pulsar, Apache Beam, Docker, Kubernetes, Real-Time Streaming, CI/CD, Monitoring, ML Operations.

Language Identification - Advanced NLP Project ⧉   Feb 2025
- Developed multilingual language identification models covering **389 languages**, utilizing rigorous data preprocessing (**TF-IDF, fastText**) and Transformer-based fine-tuned and optimized architectures **(BERT, mBERT, DeBERTaV3, XLM-RoBERTa, RemBERT, and mT5).**
- Achieved **top-tier Kaggle performance** by implementing **ensemble voting** strategies, significantly boosting classification accuracy.
- Skills required: NLP, Transformers, BERT-family models, fastText, Ensemble Modeling, Hugging Face, Fine-Tuning.

Image Retrieval for Catalog Navigation - Computer Vision Project ⧉   Jan 2025
- Built a visual search system enabling accurate product retrieval, integrating category-level **classification** and **similarity-based search** methods.
- Utilized advanced vision models **(CLIP, EfficientNet, Vision Transformers)** for robust feature extraction, significantly improving search accuracy.
- Skills required: Computer Vision, CLIP, EfficientNet, Vision Transformers (ViT), Similarity Search, Image Retrieval, PyTorch.

Intent Detection Project for a Tourism Chatbot ⧉   Nov 2024
- Implemented multiple approaches, including zero-shot, embeddings with traditional classifiers, and **fine-tuning** pre-trained models, to develop an intent detection system, achieving a 98% score using a customized evaluation metric balancing F1-macro and key metrics for critical intents.
- Skills required : Fine-Tuning, **Transformers**, CamemBert Zero-Shot Classification, SVM, Random Forest, XGBoost.

Welding Quality Prediction - Advanced ML Project ⧉   Oct 2024
- Developed predictive models to assess welding quality based on mechanical and process parameters from multivariate datasets.
- Implemented both supervised PCA-based and semi-supervised (**self-training**) approaches to address missing data (Imputation) and target variability.
- Achieved state-of-the-art results using Boosting models, validated through cross-validation and hyperparameter optimization.

Virtual Guidance Assistant Project based on Graph-RAG - ThinkAI Hackathon Project ⧉   Aug 2024
- Implemented a RAG-based chatbot for academic and career guidance for high school and university students, featuring an advanced chunking strategy and a graph-based approach using **Neo4j** structures to enhance recommendation accuracy.
- Skills required : LLM, Graph-Vector, Streamlit, Chatbot, POC.

SKILLS AND LANGUAGES

Data Science / AI Tools: Python, Pandas, Numpy, Scikit-Learn, Matplotlib, Seaborn, Pytorch, TensorFlow, LangChain, LlamaIndex, Transformers.
Data Engineering & Software: SQL, BigQuery, Firestore, GCP, AWS, Apache Pulsar, Beam, Kafka, CI/CD, Docker, Git, REST APIs, Flask, FastAPI, OOP.
Languages: English (TOEIC C1 and C1 Linguaskill Certificate), French (DALF C1), Arabic (Mother Language).