KHIREDDINE AMRAOUI

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PROFILE:

AI and Data Science engineering graduate with expertise in machine learning, deep learning, and natural language processing. Skilled in building secure, scalable AI systems, including multi-agent architectures and LLM-driven automation. Experienced in developing predictive models, NLP pipelines, and computer vision solutions for real-world applications.

EDUCATION:

Engineering School of Computer Sciences and Digital Technologies of Bejaia (ESTIN)
Campus Amizour, Bejaia
Specialty: Artificial Intelligence and Data Science
Degrees:
• **Engineer Diploma** in Artificial Intelligence and Data Science
• **Master of Research** in Artificial Intelligence and Data Science
Graduation Date: July, 2025

EXPERIENCE:

Kabas (Hybride) | Final year project | Ai engineer | February 02,2025 - June 12, 2025

- Designed and implemented a secure, modular multi-agent system to automate end-to-end data science workflows.
- Utilized LangGraph, FastAPI, and local fine-tuned LLMs to orchestrate data preprocessing, analytics, and machine learning tasks.
- Developed a sandboxed secure code execution environment, ensuring trust, privacy, and reproducibility in LLM-driven processes.
- Evaluated the system on real-world datasets, including loan prediction and housing price analysis, demonstrating scalable, privacy-preserving automation of the data science pipeline.
- Integrated prompt-based orchestration and agent autonomy within a microservices architecture, enabling adaptable and interpretable workflows.

Cerist (Hybride) | Machine learning and Deep learning Engineer Intern | July 12,2024 - October 3,2024

- Developed and deployed a multi-platform content scraper for social media platforms (Facebook) and journalism websites to collect real-time data related to natural disasters.
- Designed and implemented a Transformer-based model to classify images as forest fire-related or not, improving rapid disaster response.
- Built a Natural Language Processing (NLP) model for sentiment analysis of social media posts and comments,providing insights into public reactions to disasters.
- Leveraged LLama to extract valuable information from social media content, enhancing disaster data analytics.
- Created a comprehensive platform to visualize forest fires across Algeria using aggregated social media and journalistic data, aiding in real-time disaster monitoring and response.

The Sparks Foundation (remote) | Data Science & Business Analytics Intern | June 1, 2024– June 21,2024

- Developed a linear regression model to predict student performance and used k-means clustering to analyze Iris dataset clusters.
- Conducted Exploratory Data Analysis (EDA):
  - Retail: Analyzed sales trends using "SampleSuperstore" dataset.
  - Terrorism: Identified terrorism hotspots from the Global Terrorism Database.
  - Sports: Evaluated match datasets to determine key factors for team/player success.
- Built a decision tree classifier and a hybrid stock market prediction model combining numerical stock data with sentiment analysis of news headlines.
- Gained expertise in data preprocessing, visualization, and feature extraction using tools like Python, pandas, and matplotlib.

PROJECTS COMPLETED:

Reinforcement learning for ramp metering: training q learning and deep q learning on a sumo network to optimize the traffic flow on a highway and a ramp with traffic light and without

Predicting high Traffic: In this project, applied core data science principles, including data validation, exploratory analysis, model development, model evaluation, and business metric analysis.

- Conducted thorough data validation and exploratory analysis to identify relevant features and define the target variable.
- Developed and evaluated multiple machine learning models, comparing their performance based on accuracy and ensuring they met criteria for avoiding overfitting and underfitting.
- Selected the optimal model, balancing predictive performance with business relevance.

Money lions fraud detection: Developed a machine learning model to detect fraudulent transactions. Utilized advanced classification algorithms and handled class imbalances through oversampling techniques to enhance model accuracy. Integrated business metrics to ensure the model aligned with practical applications.
Arabic and English sign languages: Built a deep learning-based image classification model to recognize hand signs in both Arabic and English. Designed and trained the model using convolutional neural networks (CNNs) on a custom dataset, achieving high classification accuracy.
Developing Multi-Input Models For OCR: Designed a hybrid model integrating image and auxiliary data inputs for accurate text extraction, leveraging TensorFlow and Keras.
E-Commerce Clothing Classifier Model: Designed a hybrid model integrating image and auxiliary data inputs for accurate text extraction, leveraging TensorFlow and Keras.
Analyzing Car Reviews with LLMs: Utilized large language models (LLMs) to analyze customer reviews in the automotive industry. Extracted insights into customer sentiment and preferences, enabling businesses to make informed product and marketing decisions.
Question Answering LLMs: Implemented a question-answering system using fine-tuned large language models. Developed pipelines to retrieve context from text data and generate precise and contextually relevant answers.
Women Clothes sentiment Analysis : Conducted sentiment analysis on customer reviews for women's clothing. Applied natural language processing techniques and trained sentiment classification models to assess customer satisfaction trends.
J'reside : Mobile application developed with Flutter for the management of the university residence and facilitating communication between administrators and residents.
GuaspiLess(Website): university project ,A website that fights against food waste.a user can order shopping carts according to their needs and location.

CERTIFICATES:

- **DataCamp : Developing Large Language Models , Natural Language Processing , MLOps Fundamentals, Data Analyst Associate, Data Scientist Professional**
- **Deeplearning.AI,Stanford University: Machine Learning Specialist,**

SKILLS:

- **Programming & Frameworks:** Python, JavaScript, FastAPI, Flask, TensorFlow, PyTorch.
- **Machine Learning & AI:** ML & DL (CNN, RNN, Transformers), Reinforcement Learning, LLMs, NLP, Computer Vision, MLOps
- **Data Science & Analytics:** SQL, Data Analysis & Visualization, Feature Engineering, Big Data Processing
- **Tools & Technologies:** Git/GitHub, Docker, Power BI, ReactJS, Next.js, Web & Social Media Scraping, Secure Code Execution, LangGraph, Latex
- **Soft Skills:** Problem Solving, Communication, Teamwork, Self-learning