



# ABDELGHAFOUR BAMOULA

## AI Engineer & Data Scientist

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🌐 Portfolio

## PROFESSIONAL SUMMARY

AI Engineer and Data Scientist with significant experience in **Consulting**, cloud architecture, and production ML systems. Specialized in **Generative AI**, **RAG architectures**, and **Agentic AI** workflows. Proven track record deploying scalable models on Azure and AWS, optimizing inference costs, and establishing robust MLOps practices for enterprise clients.

## TECHNICAL SKILLS

- Generative AI:** LLMs (Mistral, Llama, GPT), RAG Architecture, Agentic AI, Vector Databases (pgvector, Chroma, FAISS). Frameworks: LangChain/LangGraph, CrewAI, Ollama.
- Data Science & ML:** Deep Learning, NLP, Clustering, Recommendation Systems, Model Optimization. Frameworks: PyTorch, TensorFlow, Scikit-learn, MLflow, Pandas, Visualization Libraries.
- Data Engineering:** Apache Spark (PySpark), Kafka, Databricks, ETL/ELT Pipelines, SQL/NoSQL, Neo4j (Graph DB).
- Cloud & MLOps:** Azure (Functions, ADF, AI Search, App Service, AVM, AML), AWS (Lambda, S3, EC2, SNS/SQS, SageMaker, RDS, Aurora), Docker, Kubernetes, CI/CD, IaC.
- Software Development:** Python (Expert), FastAPI, Flask, Django, REST APIs, Microservices, Git, Java, JavaScript, Agile/Scrum.

## PROFESSIONAL EXPERIENCE

### AI Engineer & Data Scientist

CGI Technologies and Solutions

Oct 2023 – Present

Rabat, Morocco

#### AI Development (GenAI & Agents):

- Co-developed and deployed a multi-agent system featuring specialized agents for Data Analysis, Clustering, and RAG utilizing a Chroma vector database and **LangChain/LangGraph**.
- Engineering a RAG chatbot for ITSM data utilizing **pgvector** to enhance semantic search capabilities.
- Developed ML modules for unsupervised clustering with optimized K-Means implementation and automated Best-K selection.
- Co-built a Recommendation System for Jira tickets using semantic similarity to identify related issues.

#### Research & Innovation:

- Designed an ITSM Knowledge Base Quality Analysis system with custom validation metrics before RAG ingestion.
- Prototyped a **GraphRAG** solution using Neo4j to improve context retrieval for complex hierarchical files.
- Investigated Multimodal LLMs to integrate vision and audio processing into the agentic platform.
- Conducted a comparative benchmark of multilingual embedding models under resource constraints.

#### MLOps & Cloud:

- Established an Azure-based DevOps GitLab pipeline with automated CI/CD, model versioning, and monitoring.
- Integrated Python-based analytics dashboards for data visualization of clustering results and KPIs.

### Cloud & Data Engineer

CGI Technologies and Solutions

Feb 2023 – Dec 2024

Rabat, Morocco

- Cloud Optimization:** Migrated 25+ Azure Data Factory pipelines to serverless Azure Functions, reducing monthly costs by **35%** and improving execution speed by **50%**.
- Production ETL:** Architected AWS-based ETL system (Lambda + Step Functions, S3, RDS) processing 50K+ records daily with **99% accuracy** and automated error recovery.
- Database Migration:** Led PostgreSQL to AWS Aurora migration, achieving 40% cost reduction.
- Cloud Migration:** Led migration of report generating application from on-premise to Azure Cloud (App Service, Azure Database).

### BI & Python Developer

DataStory

Apr 2022 – Jan 2023

Casablanca, Morocco

- Developed Python backend services integrating Power BI REST API for automated data refresh orchestration and report distribution, reducing manual effort by **90%**.
- Delivered executive dashboards enabling real-time decision-making across sales and finance operations.

- Developed a full-stack inventory management system using Python (Django) and PostgreSQL.

## **FREELANCE & INDEPENDENT PROJECTS**

**Freelance Data Scientist & ML Engineer**  
Upwork

Sep 2022 – Apr 2023  
Remote

- Delivered customer churn prediction model (85% accuracy) and worked on unsupervised learning cases.
- Built production-ready APIs with FastAPI and automated retraining pipelines.

**Freelance Data Analyst**  
Upwork

Jan 2022 – Aug 2022  
Remote

- Conducted data cleaning and exploratory analysis on multi-source datasets.
- Designed automated reporting scripts using Python (Pandas) and SQL, reducing client data processing time by 40%.

## **EDUCATION**

**PhD in Data Science & AI**

Faculty of Sciences, Mohammed V University

2025 – Present  
Rabat, Morocco

Research Focus: Agentic-AI MLOps infrastructure for healthcare applications (IPSS Lab)

**Master in Data Science & Engineering**

Faculty of Sciences, Mohammed V University

2023 – 2025  
Rabat, Morocco

Mention: Good | Project: Modular AI for Cardiovascular Risk Prevention

**Professional Bachelor in Information Systems**

Higher School of Technology (EST), Mohammed V University

2022 – 2023  
Salé, Morocco

Mention: **Top of Class** (Major de promotion)

**University Diploma in Data Science**

Higher School of Technology (EST), Cadi Ayyad University

2020 – 2022  
Essaouira, Morocco

Mention: **Top of Class** (Major de promotion)

## **CERTIFICATIONS & PUBLICATIONS**

**Certifications**

- Azure Developer Associate (AZ-204)
- Azure Data Fundamentals (DP-900)
- AWS Certified Cloud Practitioner
- Azure Data Scientist (DP-100) *[In Progress]*

**Professional Development**

- Deep Learning Specialization (DeepLearning.AI)
- Generative AI with LLMs (Udemy)
- Mastering AI on AWS (Udemy)

**Publications:**

- Creating an Intelligent Medical Chatbot for Healthcare Applications* (2025). Springer Nature. DOI: 10.1007/978-3-032-01967-7\_35

## **LANGUAGES & INTERESTS**

**Languages:**

**Arabic:** Native

**English:** Professional Working Proficiency (C1 Reading/Writing, B2 Speaking)

**French:** Professional Working Proficiency (C1 Reading/Writing, B2 Speaking)

**Interests:** Technology Innovation, Chess, History, Travel, Reading