

AI/ML Engineer and Applied Data Scientist with Engineering and Master's degrees in Computer Science, currently pursuing AI opportunities in Riyadh. Specializes in production-ready LLM applications using LangChain, CrewAI, RAG, and OpenAI APIs. Delivered 10+ AI solutions for clients across HR, retail, etc, including multi-agent systems, NL-to-SQL, and BI automation. Strong research background with IEEE and Springer 2025 publications, plus hands-on expertise in Docker, Kubernetes, FastAPI, and n8n.

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 Riyadh, Saudi Arabia

 <https://bouazizamina.github.io/MyResume/>

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Languages

Arabic

Native

English

Professional

French

Professional [TCF](#)

Technical Skills

Artificial Intelligence & Machine Learning

- Generative AI
- Large Language Models (LLMs)
- Retrieval-Augmented Generation (RAG)
- AI Agents (CrewAI, LangChain)
- OpenAI/ Groq API
- Natural Language Processing (NLP)
- Hugging Face Transformers
- BERTopic
- Vector Databases (Pinecone)
- FastAPI
- n8n

Data Science & Analytics

- Python
- R
- Jupyter Notebook
- Google Colab
- Power BI

Database

- PostgreSQL
- Microsoft SQL Server
- Oracle
- MongoDB
- MySQL

Professional Experiences

Since Feb. 2025

Freelance ML/AI Engineer

- Designed and developed custom AI solutions for clients across HR, logistics, and retail, addressing diverse business challenges.
- Built multi-agent AI systems using CrewAI and LangChain to automate business analysis and decision-making.
- Developed RAG-based chatbots and LLM-powered assistants by integrating OpenAI APIs, SQL databases, and n8n workflows.
- Created natural language-to-SQL solutions using LangChain SQL Agents, enabling non-technical users to query databases through conversational interfaces.
- Leveraged modern AI technologies, including LLMs, RAG, AI agents, vector databases, and workflow automation, to deliver scalable, production-ready applications.

From Sept. 2023 to Dec. 2024

PhD Student and Researcher

Laval University Quebec, QC, Canada

- Conducted doctoral research on leveraging Large Language Models (LLMs) for the automated decomposition of software applications into microservices, developing innovative approaches to enhance scalability and modularity.
- Analyzed microservice antipatterns and compared the proposed decomposition approach with state-of-the-art methods. Used MicroFreshener and MicroMiner to detect antipatterns and assess the quality of generated microservice architectures in collaboration with the team.
- Authored and presented the paper "[An Empirical Study on Microservices Deployment Trends, Topics, and Challenges in Stack Overflow](#)" at IEEE SANER 2025, in collaboration with Professors *Mohamed Aymen saied, Mohammed Sayagh, Ali Ouni and Mohamed Wiem Mkaouer*.
- Applied topic modeling with BERTopic to analyze Stack Overflow discussions, revealing practical microservices adoption insights for both industry and academia.
- Developed a publicly available replication package for the study using Python and the Stack Exchange Data Explorer, enabling reproducible research, supporting future studies and further validation by the community.
- Collaborated with research teams to design experiments, build prototypes, and evaluate AI-based solutions for complex software engineering problems.

From Sept. 2022 to Sept. 2023

Research Intern

University of Sherbrooke Quebec, QC, Canada

- Built a simulator to process X-ray images using a new method Scale Space Radon Transform (SSRT) allowing non-invasive visualization of internal structures of 3D objects.
- Contributed to image processing advancements for non-destructive imaging, supporting applications in safe, harm-free object analysis.
- Evaluated image reconstruction quality under varying imaging parameters and noise levels, demonstrating the superior performance of SSRT.
- Rapidly mastered complex algorithms in the astra toolbox and 3D slicer, working effectively with research teams to meet objectives.
- Authored the paper [Performance Analysis of Computed Tomography Using the Scale-Space Radon Transform](#).
- Demonstrated strong problem-solving skills .

Skills

Programming Languages

- Python
- R
- Java
- C#
- C
- JavaScript
- PHP
- Kotlin

Software Development

- Spring Boot
- Node.js
- HTML
- CSS
- Bootstrap
- Angular
- jQuery

MLOps & DevOps

- Docker
- Kubernetes
- CI/CD Pipelines
- Git/GitHub

Software Engineering

- UML
- Design Patterns
- JUnit
- Mockito
- Selenium
- Cucumber

Scientific Computing & Imaging

- ASTRA Toolbox

Operating systems

- Windows
- Linux(Redhat, Ubuntu)

Design

- Adobe Xd
- Adobe Illustrator
- Figma

Publications

IEEE SANER 2025 ["An Empirical Study on Microservices Deployment Trends, Topics, and Challenges in Stack Overflow"](#) *Amina Bouaziz, Mohamed Aymen saied, Mohammed Sayagh, Ali Ouni and Mohamed Wiem Mkaouer.*

Springer 2025 [Performance Analysis of Computed Tomography Using the Scale-Space Radon Transform](#) *Amina Bouaziz, Djemel Ziou, Aicha-Baya Goumeidane, Nafaa Nacereddine.*

Professional Experiences

From Sept. 2021 to Dec. 2021

Software developer intern
[Sonelgaz](#) Algiers, Algeria

- Designed and implemented a web application that facilitates the generation of web services for the national utility company, applying software engineering principles learned during academic studies.

From Sept. 2020 to July 2021

Developer & Graphic Designer
[School of AI \(SOAI\)](#) Algiers, Algeria

- Organized and participated in events focused on artificial intelligence, enhancing community engagement and knowledge sharing.
- Created graphic designs, including logos, charts, and posters, using illustration tools to support AI-related events and initiatives.

From Sept. 2018 to July 2021

Web Developer
[Club Scientifique de l'Esi \(CSE\)](#) Algiers, Algeria

- Maintained club websites and supported digital initiatives.

Education

From 2018 to 2023

Master's and Engineering Degrees
[Higher School of Computer Science \(ESI\)](#) Algiers, Algeria
Graduated with honor

From 2015 to 2018

Baccalaureate
[Nedjay Othman High School](#) Batna, Algeria
Rated Excellent

Projects

Centralized AI Portal
06/26-09/26

Designed and developed a centralized AI platform that consolidates and provides unified access to multiple AI services through:

- Unified access portal (shared base DNS)
- Unified authentication (Keycloak)
- Unified deployment pipeline (Kubernetes + Portainer + Gitea)
- Unified LLM gateway (LiteLLM)
- Database layer (PostgreSQL)
- Unified vector database (Qdrant)
- Custom applications such as AI Chat, document summarization, translation, information extraction, etc.

Additionally, developed an intelligent assistant to guide users, explain platform features, and provide contextual support throughout the platform.

Technologies: Kubernetes, Docker, Ldap, Python

Knowledge Base Manager
04/26

An end-to-end application for managing the enterprise knowledge base by:

- Providing the ability to read different file formats using LLM-based OCR.
- Automatically detecting conflicts before inserting information into the knowledge base and providing conflict resolution options (keep old, keep new, merge with AI, or manually edit).
- Supporting both semantic and keyword retrieval.
- Providing the possibility to export the knowledge base through MCP for use by other agents, such as chatbots.
- Technologies: RAG, OCR, Langchain, Python

Certificates

Microsoft Certified: Fabric Analytics Engineer Associate [certification link](#)

Microsoft Certified: Azure Data Scientist Associate [certification link](#)

Generative AI with Large Language Models Generative AI, model pre-training, fine-tuning, evaluating LLMs and LLM-powered applications

Introduction to advanced tomography Coursera [certification link](#)

Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization Coursera [certification link](#)

Fundamentals of Deep Learning Nvidia [certification link](#)

Neural Networks and Deep Learning Coursera [certification link](#)

Full-Stack Web Development with React Specialization Coursera

Modern JavaScript for React JS - ES6. Udemy [certification link](#)

Motion Design Udemy

UI/UX Design Specialization Udemy

Projects

RAG System with LangChain and Agents

04/26 - 06/26

An interactive chat system that answers questions based on specific documents and web pages while considering chat history. Prompts are structured using LangChain chains with memory, and the model was evaluated through both manual evaluation and LLM-assisted evaluation methods before integration into an autonomous agent.

Technologies: Python, Groq, LangChain, Agent, RAG

Business Intelligence Agent

03/26

An intelligent BI system that converts natural language questions into SQL queries, retrieves data from databases, generates interactive Plotly visualizations, and provides AI-driven insights to support data-driven research and analysis without requiring SQL expertise.

Technologies: Python, LangChain, SQL Agent, Plotly.

AI-Powered Profiles Evaluation Agent

01/26

AI agent that automatically retrieves profiles from a database, ranks them based on keywords and positions, evaluates their suitability using OpenAI LLMs, assigns scores, and stores results in the database. The entire workflow is orchestrated end-to-end using n8n automation.

Technologies: Python, OpenAI, microsoft SQL server, n8n, Streamlit

Microservices Research

07/24 - 09/24

Analyzed microservice antipatterns and compared the proposed decomposition approach BMSC-Decomp with state-of-the-art methods, including CoGCN, HierDecomp, and Mono2Micro. Used MicroFreshener and MicroMiner to detect antipatterns and assess the quality of generated microservice architectures in collaboration with the team.

Technologies: Python, MicroFreshener, MicroMiner, Maven, Java, Github

Replication Package

03/24 - 06/24

Developed a replication package for a study on microservices deployment trends, topics, and challenges in Stack Overflow, using topic modeling with BERTopic as presented in the associated [research paper](#).

Technologies: Python, BERTopic, Stack Exchange Data Explorer

Computed Tomography Simulator

01/23 - 09/23

Developed a CT simulator during a research internship using the novel Scale-Space Radon Transform (SSRT) for non-destructive X-ray imaging. Compared SSRT with the Radon Transform (RT) to evaluate image reconstruction quality. [research paper](#)

Technologies: Python, astra toolbox, 3D slicer, SSRT

AI Financial Advisor

11/25

AI assistant that analyzes income, expenses, and investments, retrieves the latest financial news through web search, and generates personalized recommendations and AI-driven financial insights.

Technologies: CrewAI, LangChain, OpenAI, Plotly

Collaborative Financial Analysis System

09/25

A multi-agent financial analysis solution using **CrewAI** and **LangChain**. Specialized AI agents collaborated to collect, analyze, and interpret financial data, generating structured insights and recommendations. The system automated complex analysis workflows, improving the speed, consistency, and quality of financial decision support.

Technologies: Python, Crew, LangChain, OpenAI

AI Agent for Supplier Selection

04/25

An AI agent that selects the most suitable supplier for sourcing raw materials by analyzing structured supplier data based on user-defined criteria. The agent uses predefined tools to make decisions, with all actions and requests tracked through the Phoenix platform for evaluation

Technologies: Python, Smolagents, LangChain, Groq

Sentiment app

03/25

A sentiment analysis solution using LLMs that classify comments as positive or negative.

Technologies: FastAPI, LLMs

Projects

Smart Reply app

02/25

A smart reply application that generates context-appropriate responses to given emails.

Technologies : Flask, OpenAI

Analyse Antipattern Microservices

01/23

Analyzed a set of antipatterns in microservice applications and compared the proposed method with three existed approaches.

Technologies : Python

Force Graph

11/22

- Create a visual code on football data, based on the force graph.
- Add interactions such as movement and zoom to the graph.

Technologies : JavaScript, D3.js

Crop Detector

08/22

- Create an AI model and a web application that detects the most suitable crop to plant on a defined soil.

Technologies : Node js, React, Tensorflow, keras, pandas, sklearn, pickle

Stress Classifier

04/22

- A classifier model that can distinguish whether a person is stressed or not according to training data such as the degree of stress, heartbeats...

Technologies : Python, flask

Rental of driverless cars

03/22 - 06/22

- My role in this project is to participate in:

1/The design of the architecture of the solution.

2/The design of the database.

3/The implementation of the BackEnd part.

Technologies : Node Js, Postgres, FireBade, Windsor

Play golf ?

03/22

- A classification model based on "Decision Tree" and "Naive Bayes" classifiers to determine whether a person is permitted to play golf based on pre-defined categorical weather data.

Technologies : Python, pandas, scikit-learn, numpy, timeit, graphviz

Mini-compiler

11/21 - 01/22

- Implement a mini-compiler that performs the different phases of compilation, namely lexical analysis and syntactic-semantic analysis.

Technologies : Flex, Bison

VTC Client & Admin

10/21 - 01/22

- Design and production of 2 websites:

1/ allows users to post their ads in order to find carriers to deliver their packages.

2/ an admin website that allows them to manage the VTC Client website.

Technologies : Html, Css, JavaScript, Bootstrap, Php

CirSim

02/20 - 06/20

- Design and implement a desktop application that allows students to design and simulate a digital logic circuit.

Technologies : C#, .Net