Anis Ben Houidi

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COMPUTER SCIENCE ENGINEERING GRADUATE

Computer Science Engineer specialized in Artificial Intelligence, with strong theoretical knowledge and experience in building machine learning, deep learning, and intelligent systems. Driven by curiosity and solid analytical skills, I strive to design innovative solutions for the industry.

PROFESSIONAL EXPERIENCE

GRIFT Group of CRISTAL Laboratory August 2025 - October 2025r
AI Engineer
Introducing Complex, Fourier-Mellin, and Zernike moments to classification and segmentation models.
In the process of publishing a paper.

GRIFT Group of CRISTAL Laboratory July 2025 - Augus 2025t
1st Year Project Validation Internship - Computer Vision
Introducing Complex, Fourier-Mellin moments to deep learning Architectures for geometrically invariant semantic drone image segmentation in low-data regimes.

Talan Tunisie Feb 2025 - June 2025
AI Intern - End of Studies Internship
Researching and developing a video compression framework relying on Recurrent All-Pairs Field Transform (RAFT) for motion flow prediction, a novel Hyperprior Entropy Coding method for learned data compression, and Quantum Fourier Transform (QFT) for high resolution I-frame compression.
As well as collaborating in 5 unique projects ranging from AI in biology and healthcare, to Generative and Agentic AI and Quantum computing and working with an Ophthalmologist in the diagnosis of eye region diseases and 3D reconstruction of the lacrimal tear duct, during an intensive five weeks bootcamp.

Talan Tunisie July 2024 - August 2024
SummerCamp AI 2024 Intern
Worked within a team of 8 in the development of a predictive digital twin for in-silico CRISPR-Cas9 applications.

- Contributed to the predictive pipeline by managing genomic reference databases, generating and evaluating gRNAs for efficiency and off-target effects using BLAST and FASTA, and integrating UCSC REST API data with LLM-based RAG models to predict the biological impact of resulting mutations.
- The project was reviewed by the director of The Pasteur Institute of Tunis and presented to a jury of biotech professionals and academics at the conclusion of the internship.

EDUCATION

National School of Computer Science - ENSI 2021-2025
Engineer's Degree, Computer Science - Specialty in Artificial Intelligence and Decision Systems

Preparatory Institute for Engineering Studies of Nabeul 2019-2021
PC-Physics and Chemistry

PROJECTS

AI Recruitment Test Generator for EY x IKU Hackathon

- Architectured and developed an LLM-powered multi-modal pipeline using Llama 3.1 and RAG to automatically generate recruitment tests for the EY x UIK AI Hackathon, winning 2nd place.

Keywords: MultiModal **RAG, Python, NLP, Llama 3.1**

TuniBot: An AI that speaks Tunisian

TuniBot, a multi-agent AI powered by TuniSpeak, a Talan Tunisie internal Tunisian dialect LLM.

- **Translation Agent**: Handles text and speech translation with dialectal nuance.
- **Music Agent**: Analyzes, translates, and recommends music contextually.
- **Culture Agent**: Provides insights into Tunisian culture, idioms, and traditions.
- Tech Stack: Vosk ASR for speech, PyTesseract for vision, and context-based routing for seamless agent coordination.

Keywords: **multi-agent AI, LLM, Tunisian dialect, TuniSpeak, translation, music AI, cultural intelligence, speech recognition, OCR, context routing, multimodal AI.**

Radiology Platform for AI-assisted Disease Diagnosis

A radiology platform aimed at the medical sector to coordinate between healthcare practitioners and assist in medical diagnosis from medical scans with deep learning.

- Used Django’s template engine to help in developing the frontend.
- Used MySQL for the database.
- Helped with implementing a multi-user two-factor authentication system with OTP authentication.
- Developed an image classification CNN model in Tensorflow.
- Integrated the model in the Django backend.

Keywords: **Python, Django, Convolution Neural Networks, MySQL**

SMILES Drug Sequence Prediction

Undertook in the Talan PFE Bootcamp, this project delves into computational drug discovery by predicting SMILES strings (a textual representation of a molecule's structure) from protein target sequences, by finetuning and benchmarking different LLMs (bioBert, Mistral, DeepSeek etc).

Keywords: **LoRa Finetuning, Generative AI, LLMs, BioBert, Mistral, DeepSeek**

Ophthalmic Eye Disease Diagnosis

Worked with an ophthalmologist in the collection and cleaning of data and building computer vision models for eye region disease diagnosis, the models included deep learning architectures like VGG16, and math-based approaches relying on eye region distances and metrics such as MRD1/MRD2.

Keywords: **Manual Data Collection and cleaning, VGG16, Python**

AI Guidance Map for Travellers

Used an LLM (Qwen 2.5) and Dijkstra's algorithm for a guidance map system for foreign travellers in Tunis.

Keywords: **Google Maps API, Qwen 2.5 LLM, Dijikstra’s Algorithm**

Comparative Analysis of Convolutional vs Recurrent Models in Sequential Data Processing

- Built an NLP pipeline from loading data, stemming and text cleaning to embedding and vectorization and developed different architectures of CNNs and RNNs with variations including LSTM and Attention layers in tensorflow to evaluate their performance in processing large amounts of texts.

Keywords: **Tensorflow, Python, NLP**

Data Warehousing of Student Performance Assessements Data

Integrated Apache NiFi, MySQL and Power BI to automate the ingestion, multidimentional processing, warehousing, and visualization of data from multiple CSV files, enabling insights from dashboards.

- Performed data ingestion with Nifi from a csv file and implemented a processor pipeline for data cleaning.
- Used Nifi to transform multidimentional data into a star schema and output the processed data to MySQL database.
- Used Power BI to connect to the database and perform dashboarding and visualizations to assess student performance.

Keywords: **Apache Nifi, Power BI, MySQL**

Multi-Agent Energy Distribution System

Setup a multi-agent system in JADE to optimize energy distribution among different components in a power grid.

- Implemented three types of agents in JADE, an energy source agent, a consumer agent and utility agent that surves as the coordinator, and which communicate with ACL language to update to inform and update their status and interact with other agents.

Keywords: **Java, JADE, IntellijIDEA, Multi-Agent Systems, Swing**

Lambda Architecture Weather Big Data Analysis

Implemented a Lambda architecture for analyzing real-time weather data from OpenWeather API.

- Used Kafka for data ingestion from the API.
- Used Spark for processing and transforming real time data for the stream layer.
- Deployed a dockerized HDFS mini cluster to store data for later batch processing.
- Used Cassandra as a scalable NOSQL DB for querying to extract insights from the data.

Keywords: **Hadoop, Docker, HDFS, Kafka, Spark, Cassandra**

Dynamic Cryptographic Key Rotation with Deep Reinforcement Leanring

This was a project done in DeepFlow AI Hackathon as a strategy to counteract quantum cyber attacks, winning 1st place amongst 30 teams from the technical jury.

- Tested different SVM kernels on the KDD cyber attacks dataset for identifying threats.
- Deployed a custom gym environment to simulate key rotation based on network status.
- Implemented a key generation algorithm.
- built and trained a deep Q-network (DQN) agent with a Boltzmann policy to optimize key rotation decisions based on attack patterns.
- Created a real time visualization of the simulation in matplotlib .

Keywords: **Python, Deep Reinforcement Learning, SVMs, Gym, Matplotlib**

Static React Portfolio Deployed on Vercel

- Used React and TailwindCSS to create a portfolio showcasing my projects, experience and academic journey.
- Deployed the project on Vercel.

Keywords: **React, JavaScript, TailwindCSS, Vercel**