Rana Romdhane

AI/ML Engineer

Ariana, Tunisia | ranaromdhane1@gmail.com | (+216) 22 14 14 39 | LinkedIn | GitHub

Professional Summary

AI/ML Engineer with a Computer Science engineering degree and hands-on experience designing, training, and deploying end-to-end machine learning solutions spanning predictive modeling, computer vision, NLP, and LLM-based applications. Published researcher in Vision-Language Models, combining strong software engineering fundamentals – including modern React/TypeScript front-end development – with a focus on delivering measurable, production-ready results.

Professional Experience

AI Engineer Intern (Final-Year Project) | SORETRAK – Kairouan, Tunisia — Feb 2026 – June 2026

- Designed and delivered **TransportAI**, an intelligent public transport management platform integrating a **React** analytical dashboard, an ML prediction engine, an assisted planning system, and a breakdown management module
- Benchmarked multiple regression models (Random Forest, XGBoost, Gradient Boosting, Linear Regression) for operational forecasting; selected Random Forest achieving **$R^2 = 0.997$**, enabling data-driven planning from previously underexploited company data
- Engineered a **multilingual conversational assistant** using a RAG pipeline (LangChain, ChromaDB) over a locally deployed LLM via **Ollama**, achieving **96% answer faithfulness** on a 50-question evaluation set
- Architected a fully on-premise, cloud-independent stack (React, FastAPI, Oracle 11g, Ollama) and built the platform's responsive React front-end consuming FastAPI REST APIs, guaranteeing data confidentiality and operational autonomy

AI Engineer Intern | Sté Dabba Dabba – Monastir, Tunisia — June 2025 – Sept 2025

- Developed a BERT-based NLP model reaching **87% accuracy** in task prioritization across 10,000+ tasks within an AI-powered task management application (**React/Next.js**, GTD methodology)
- Automated scheduling through calendar API integration, cutting manual planning time by **65%**

Data Analytics Intern | Maram Company – Ksar Hlal, Tunisia — June 2024 – July 2024

- Automated ETL pipelines for financial data with Python and Power BI, reducing processing time by **60%**
- Built 12+ executive KPI dashboards and analyzed 200K+ financial records to surface trends and anomalies

Projects & Publications

Vision-LLM for Compound Facial Emotion Recognition – Published Research — GitHub

- Benchmarked four architectures (ResNet50, ViT, LLaVA-1.5, BLIP-2) for compound emotion recognition on the RAF-CE dataset (3,618 images, 14 classes); fine-tuned BLIP-2 with LoRA to **96.81% accuracy / 97.91% macro F1**, a 117% gain over CNN baselines
- Validated model attention on facial action units using Grad-CAM and SHAP; deployed a real-time Streamlit demo
- First author of *"Beyond Binary Emotions: A Multi-Architecture Vision-Language Approach for Compound Facial Expression Recognition"* – COC 2026 international conference (Senegal)

Intelligent Network Intrusion Detection System (ML-based IDS) — GitHub

- Built a multi-model intrusion detection system (Random Forest, SVM, Neural Networks) covering 8 attack families, including DoS/DDoS, brute force, SQL injection, and botnet activity
- Delivered real-time traffic monitoring with a WebSocket dashboard, severity-based alerting, and SIEM integration via the ELK Stack

Tawa – Cross-Platform Food Kit Delivery App (React Native) — GitHub

- Built a cross-platform (iOS/Android/web) mobile app with **React Native (Expo)** and **TypeScript**, covering product catalog, shopping cart and ordering flow, and location-based delivery tracking
- Implemented file-based navigation with Expo Router and a reusable, utility-first UI with NativeWind (Tailwind CSS), integrating a REST API backend

Technical Writing: Author of *"Unraveling the Web of Network Protocols"*, published in **Code Spectrum** magazine, IEEE Computer Society Chapter, ENICarthage (June 2024)

Education

National Engineering School of Carthage (ENICarthage) – Charguia 2, Tunisia — Sept 2023 – July 2026
Engineering Degree in Computer Science (Diplôme National d'Ingénieur)

Preparatory Institute for Engineering Studies of Monastir – Monastir, Tunisia — Sept 2021 – June 2023
Preparatory Studies in Engineering (Physics–Chemistry Track)

Technical Skills

Programming: Python, Java, SQL, JavaScript/TypeScript

Machine Learning & Deep Learning: PyTorch, TensorFlow, Scikit-learn, XGBoost, Pandas, NumPy, OpenCV, Computer Vision, NLP

LLMs & Generative AI: RAG pipelines, LangChain, ChromaDB (vector databases, embeddings), Ollama, Hugging Face Transformers, LoRA fine-tuning, BERT, Explainable AI (SHAP, Grad-CAM)

Frontend & Web: React, Next.js, React Native (Expo), TypeScript, Tailwind CSS, HTML/CSS, REST API integration, responsive design

Deployment & Tools: Model deployment (Docker, FastAPI, Streamlit), MLOps, Flask, Git/GitHub, CI/CD, Linux, Power BI

Databases: Oracle, PostgreSQL, MySQL, MongoDB, Elasticsearch

Certifications

- **NVIDIA Deep Learning Institute:** Generative AI with Diffusion Models (Dec 2025)
- **NVIDIA Deep Learning Institute:** Fundamentals of Accelerated Data Science (Dec 2025)
- **NVIDIA Deep Learning Institute:** Enhancing Data Science Outcomes with Efficient Workflows (Dec 2025)
- **IBM SkillsBuild / Cisco Networking Academy:** Artificial Intelligence Fundamentals (Aug 2025)

Languages

Arabic: Native **English:** Advanced (C1) **French:** Upper-Intermediate (B2)