

JAD ALAOUIE

MACHINE LEARNING · ARTIFICIAL INTELLIGENCE ENGINEER

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PROFILE

Dedicated Machine Learning Engineer with a strong foundation in developing and deploying machine learning models. Proficient in Python, Java, C, C++, and SQL, with expertise in ML frameworks including TensorFlow, PyTorch, LangChain, and Scikit-Learn. Experienced in Natural Language Processing (NLP), Large Language Models (LLMs), Prompt Engineering, and Data Analysis. Skilled in data visualization using Tableau, Matplotlib, and Pandas. Adept at leveraging machine learning, deep learning, and neural networks to solve complex problems. Focused on delivering impactful solutions through innovation and technical expertise.

PROFESSIONAL EXPERIENCE

Tech Lead

A2Z TechPro — Beirut, Lebanon (Remote) · Jun 2025 – Present

- **Grand Cinemas Kuwait — AI-Powered WhatsApp Automation System.** Engineered a full-scale AI-driven WhatsApp automation system using n8n and the Meta WhatsApp Business API, enabling customers to interact seamlessly in English and Arabic.
 - Fine-tuned LLaMA 3.1 8B using Unsloth on a custom dataset for message classification, intent recognition, and conversational understanding; converted to GGUF format for optimized local inference with Ollama API.
 - Deployed a self-hosted Llama 3 model for classification, intent recognition, and language detection, alongside Whisper for voice message understanding.
 - Dockerized the entire system on a Cloudflare domain, reducing reliance on paid APIs and lowering operational costs by over 80%.
 - Integrated real-time sync with Grand Cinemas movie database (Now Showing, Coming Soon, booking) via RESTful API, with Gmail API notifications to cinema managers.
 - Designed a dynamic multilingual interface covering movie inquiries, birthday bookings, feedback forms, and event reservations.
- **Grand Cinemas Middle East — Cinema Performance Dashboard (Vista Integration).** Developed and deployed a secure web-based cinema analytics dashboard integrating live Vista SQL Server data with interactive operational and financial reporting.
 - Built a Node.js/Express backend for real-time reporting across admissions, box office, concessions, revenue, spend per head, average ticket price, occupancy, and sales channels.
 - Implemented actual vs. budget and year-over-year comparison modes with month-to-date budget proration for accurate live reporting.
 - Created JWT authentication, role-based access control, and budget management via local JSON configuration files.
 - Deployed on Windows Server with IIS reverse proxy, automated recovery scripts, health checks, logging, rate limiting, and security headers.
- **Grand Entertainment / Grand Cinemas — Full-Stack Corporate Platform.** Built a full-stack platform combining a bilingual corporate website, a secure CMS, and a Vista-connected cinema operations dashboard.
 - Developed backend APIs for authentication, content publishing, media uploads, and health monitoring; managed a large multilingual movie library with trailers, hero banners, and catalog assets.
 - Integrated Vista SQL data pipelines into a local analytics dashboard covering admissions, revenue, occupancy, and concession performance.
 - Handled IIS/Windows Server deployment with scheduled syncs, automated backups, reverse-proxy hosting, and security hardening.
 - Tech stack: Node.js, Express.js, HTML5, CSS3, EJS, SQLite, Microsoft SQL Server, JWT, bcryptjs, Helmet, IIS, Windows Server, PowerShell, NSSM.
- **PIB (Partners International Brokers) — Insurance Platform Website & WhatsApp Bot.** Designed and developed a full production website and an AI-powered WhatsApp bot for PIB, enabling users to discover insurance policies and

register directly through WhatsApp.

- Built a responsive corporate website showcasing PIB's insurance product catalog across health, life, motor, property, and travel categories.
 - Developed an intelligent WhatsApp bot allowing users to browse available policies, ask coverage questions, and complete registration flows end-to-end without leaving the chat interface.
 - Integrated a structured conversation flow with dynamic menus, policy recommendation logic, and user data capture routed to PIB's back-office systems.
- **BEClleb — Bejjani Engineering & Contracting Website & WhatsApp Bot.** Developed a full production website at becleb.com featuring a CMS and PIB-partners integration. Built and integrated an n8n-powered WhatsApp bot for client interaction and automated responses.
 - **EYT Burger — Intelligent WhatsApp Ordering & Feedback Assistant.** Designed and deployed an AI-powered WhatsApp chatbot enabling customers to browse menus, place orders, track deliveries, and submit reviews entirely through WhatsApp.
 - Integrated Supabase as a real-time backend for order storage, status tracking, and conversation state management.
 - Built custom JavaScript logic within n8n to parse, validate, and format order payloads with interactive confirm/modify/cancel buttons.
 - Added multilingual detection and greeting normalization supporting English, Arabic, and French.
 - Built a feedback workflow extracting customer reviews from WhatsApp interactive forms, auto-tagging data for service evaluation.
 - **EYT Burger — Customer Analytics Dashboard.** Built a branded analytics dashboard tracking customer behavior across QR/menu visits, WhatsApp bot orders, and reviews, with customer segmentation, repeat-customer highlighting, sentiment trend analysis, interactive filters, drill-down views, and CSV export.

Artificial Intelligence Research Engineer

National Center for Natural Hazards & Early Warning (NCNE) · Beirut, Lebanon · May 2025 – Present

- **Real-Time OSINT Incident Intelligence Platform.** Designed an end-to-end real-time incident monitoring pipeline for Lebanon ingesting news from X/Nitter, Facebook, Telegram, and official feeds every 2 minutes, storing normalized data in SQLite. Live at lebanon.cnrs.edu.lb
 - Built a multilingual (Arabic/English) dashboard with subtype-specific map icons, served via FastAPI + React/Vite with WebSocket real-time updates.
 - Implemented hybrid AI + rule-based classification (conflict, casualty reports, surveillance) using a local LLM (Llama via vLLM) to reduce false positives in Arabic social/news data.
 - Operationalized 8+ background services (scrapers, classifier, API, LLM, email, backup) with health monitoring, restart scripts, and automated backups; supports shelters integration, emergency numbers, airport tracking, and official circulars.
 - Platform output was reviewed and curated by the NCNE team to eliminate duplicates; verified incidents were subsequently published on **Al Jazeera's official Instagram account**, reflecting the project's real-world media impact.
 - Tech stack: Python, FastAPI, React, Vite, SQLite, Playwright, Telegram API, Llama via vLLM, WebSocket, Google Sheets integration.
- **Libelium Air Quality Dashboard — French Embassy Beirut.** Designed and deployed a continuous environmental monitoring dashboard for the French Embassy compound, presenting seven atmospheric parameters from the CNRS-L Libelium sensor network as live and monthly insight reports. Live at lebanon.cnrs.edu.lb/AirQuality
 - Monitors PM2.5, PM10, NO2, O3, SO2, VOC, and CO in real time with automated threshold alerts and daily trend analysis (e.g. PM2.5 averaged 1.35x reference in January 2026, peaking at 55.75 ug/m3).
 - Built executive summary reports identifying highest-pressure pollutants, peak days, best air quality days, and period-over-period comparisons with pollutant source classification.
- **Multi-Source News Intelligence Platform — Floods & Fires.** Developed an automated aggregation platform for flood and fire-related news, ingesting content from RSS feeds, X (Twitter), and Facebook, using local LLAMA 3.3:70b for classification and storage, reducing manual overhead and API costs by over 50%.
- **AI-Powered Fire Detection System.** Engineered a real-time fire and smoke detection solution using YOLOv11n optimized for drone footage, with live inference on NVIDIA Jetson Nano for real-time hazard monitoring.
- **WhatsApp Fire Forecast Bot.** Created an automation bot delivering localized fire forecasts across Lebanon via WhatsApp, alerting action takers when extreme or very high fire risk is predicted within 3-day windows.
- **Solar Panel Segmentation Model.** Built a high-precision solar panel detection system using Mask R-CNN with ResNet-152 backbone, achieving 98% average segmentation confidence from aerial imagery.

- In collaboration with ESCWA, conducted multiple training sessions for candidates from Syria, Yemen, Djibouti, and Lebanon, covering Deep Learning and AI fundamentals and demonstrating how satellite imagery was leveraged for solar panel detection.

- **Building Footprint and Tree Detection System.** Developed semantic segmentation models from satellite/aerial imagery, evaluating DeepLabv3, UNet++, and Segment Anything Model 3 (SAM3) for geospatial feature extraction and land use analysis.

Artificial Intelligence Intern

ZAKA AI — Remote (Middletown, Delaware, USA) · Jan 2025 – Apr 2025

- Developed multimodal chatbots integrating APIs, NLP techniques, LangChain, and Streamlit supporting text, voice, and image interactions.
- Contributed to a research project inspired by Meta's TextStyleBrush for text style transfer.
- Automated YouTube video generation for ZAKA's weekly podcast using Python scripting.
- Contributed to Aralects, an AI-powered Arabic pronunciation application: implemented audio playback, enhanced the evaluation pipeline with accuracy-per-sound-type and error category scoring, optimized performance via reference audio precomputation, and conducted literature review on Arabic pronunciation assessment.

Data Analysis Intern

Lebanese Alternative Learning Hybrid — Beirut, Lebanon · Jul 2024 – Aug 2024

- Supported data collection, entry, and analysis under senior M&E staff guidance.
- Ensured data integrity and completeness in organizational databases.
- Collaborated with the M&E team to streamline monitoring and evaluation processes.

Research Assistant — Vision-Based Navigation

American University of Beirut — Beirut, Lebanon · Sep 2023 – Feb 2024

- Developed real-time object detection using YOLO V8 for a navigation system aiding visually impaired individuals.
- Optimized system performance through data preprocessing and model evaluation.

EDUCATION

Bachelor of Science in Computer Science

American University of Beirut — Beirut, Lebanon · Jan 2021 – Dec 2024

CERTIFICATIONS

Deep Learning with PyTorch

Skills: Machine Learning, PyTorch

IBM
Oct 2024

Introduction to Neural Networks and PyTorch

Skills: ML, PyTorch, Neural Networks, Python

IBM
Oct 2024

LangChain for LLM Application Development

Skills: Agents, LangChain, LLMs, Python

DeepLearning.AI
Sep 2024

Quality and Safety for LLM Applications

Skills: Prompt Engineering, Safety, LLMs

DeepLearning.AI
Sep 2024

Machine Learning Specialization

Skills: Neural Networks, NLP, TensorFlow, Scikit-Learn

DeepLearning.AI
Jul 2023

Intermediate Python for Data Science

Skills: Pandas, NumPy, Matplotlib, Python

DataCamp
Aug 2022

Google Data Analytics Specialization

Coursera
Jul 2022