

Mahdi El Zein

Beirut, Lebanon | (+961) 76-054231 | alzeinmahdi@gmail.com | linkedin.com/in/mahdi-el-zein | github.com/mahdizn1

Summary

Results-driven AI & Robotics Autonomy Engineer with expertise in 3D point cloud processing, multi-agent systems, and machine learning. Proven track record in developing robust perception systems for robotics autonomy and architecting end-to-end, AI-based applications. Adept at bridging the gap between hardware-level data acquisition and cloud-native model deployment.

Experience

Robotics Autonomy Engineer (Part-time since Apr 2026) Mar 2025 – Present

Stealth Startup Remote

- Engineered a LiDAR-based ROS2 3D point cloud processing pipeline integrating RANSAC and PCA/SVD for robust plane fitting, DBSCAN clustering, and KNN-graph based denoising, achieving a segmentation accuracy of 83%.
- Developed and trained a custom computer vision model for robust object detection and segmentation in a dynamic, real-world environment.
- Engineered a sensor fusion system integrating LiDAR and mmWave radar, implementing a point cloud filtering algorithm that improved detection accuracy by 25%.
- Built a high-fidelity simulation environment using AirSim and ArduPilot to accelerate the prototyping and validation of complex AI algorithms.
- Programmed embedded systems for real-time, multi-sensor data acquisition and on-device processing.

Freelance AI Automation Consultant Jul 2025 – Sep 2025

Self-Employed Remote

- Intelligent WhatsApp Support Automation:** Architected and deployed an end-to-end, AI-powered support chatbot for an e-commerce client using n8n, OpenAI (GPT-4o), and Supabase. Engineered a complete RAG system with a vector database (pgvector), persistent conversational memory, and a robust human-agent handover system.
- Automated Shipment Tracking:** Engineered an automated n8n workflow polling XML APIs to dispatch real-time WhatsApp shipping updates, eliminating manual tracking for 100% of client shipments.

Machine Learning Engineer Mar 2024 – Feb 2025

Mobile Arts Beirut, Lebanon

- Analyzed extensive Google Ads data to identify system bottlenecks and implement models for ad automation.
- Collaborated with Subject Matter Experts (SMEs) to translate complex business rules into robust ML model specifications.
- Built data preprocessing pipelines and ML models in AWS SageMaker using scikit-learn and PyTorch.
- Managed model artifacts via Amazon S3, deployed real-time inference endpoints on AWS, and built an automated MLOps CI/CD pipeline.

Skills

AI & ML:	3D Point Cloud Processing, Computer Vision, LangGraph, RAG, Scikit-learn, PyTorch, ONNX
Databases & Backend:	PostgreSQL (pgvector, RLS), Redis, MongoDB, Supabase, FastAPI (Async), MinIO
Robotics & Tools:	ROS2, AirSim, ArduPilot, Python, JavaScript, Git, Docker Compose
Cloud, MLOps & Security:	AWS SageMaker, CI/CD, MLflow, HashiCorp Vault, n8n, Linux/WSL

Certifications & Bootcamps

AI Engineering Bootcamp | SE Factory Apr 2026 – Jun 2026

Intensive 8-week program building multi-agent systems (LangGraph), advanced RAG (Multi-Query Retrieval, GraphRAG), and containerized async FastAPI microservices integrating Redis, RLS, and AI Guardrails.

AWS Certified AI Practitioner | **AWS Certified Machine Learning Engineer – Associate**

Education

American University of Beirut, Beirut, Lebanon Sep 2020 – Aug 2023
Bachelor of Science in Computer Science

Languages

Arabic: Native | **English:** Professional | **French:** Limited