Aymane El Fahsi

Tangier, Morocco | aymaneelfahsi2003@gmail.com | about.routensim.com

Profile

Systems Engineering graduate from École Centrale Casablanca, with an academic semester at École CentraleSupélec in Paris-Saclay focused on AI model optimization and multi-agent systems. Graduation thesis focused on mathematical modeling, discrete-event simulation, data analysis, and ML/deep learning targeting industrial operations, supply chain, and logistics.

Education

École Centrale Casablanca — Casablanca, Morocco
Engineering Degree - Systems Engineering, Graduated Sep 2025, 3-Year Average GPA: 3.88/4.33 — *Sep 2022 - Sep 2025*
- Operations research, supply chain/logistics modeling, industrial simulation, digital twins, predictive analytics, computer vision, deep learning, reinforcement learning, Lean Manufacturing, Six Sigma, ERP systems.

École CentraleSupélec — Paris-Saclay, France
Academic semester, GPA: 4.03/4.33 - Complex Systems Optimization track, AI and Robotics — *Feb 2024 - Jun 2024*
- Optimization and flow management in complex systems; optimization/control of multi-agent dynamic systems; AI, reinforcement learning, collaborative robotic systems, human-machine synchronization.

Undergraduate / Research Experience

UM6P MILEX Project, in collaboration with SAPRESS Logistics & Messagerie — Casablanca, Morocco
Undergraduate Final-Year Research Internship (PFE) - Intelligent Mobility and Sustainable Urban Logistics — *Mar 2025 - Sep 2025*
- Formulated a MILP model for a time-dependent pickup-and-delivery vehicle routing problem with time-space discretization, time-window selection variables, and travel times varying by weekday and time of day.
- Developed a hybrid Genetic Algorithm with an Adaptive Large Neighborhood Search metaheuristic, Clarke-Wright and Solomon construction heuristics, fuzzy C-medoids clustering, and dynamic re-optimization for order additions/cancellations.
- Benchmarked graph neural approaches for Casablanca travel-time prediction on 125,586 OpenStreetMap nodes, using a 300GB+ synthetic traffic dataset composed of simulated network states and hosted with Google Cloud Storage for Kaggle training/refinement.
- Delivered an integrated TMS prototype with route planning, real-time re-optimization, time-dependent edge weights, and operator interface.

Newrest — Casablanca, Morocco
Supply chain analysis project on cold-storage flows — *Oct 2024 - Feb 2025*
- Analyzed -18°C cold-storage flows; mapped bottlenecks and KPIs; recommended space use, cost control, service continuity, and automation transition.

Air Liquide and CentraleSupélec — France
Hydrogen supply chain simulation project on filling-center operations — *Feb 2024 - Apr 2024*
- Built a Simul8 discrete-event model of Air Liquide's hydrogen Filling Center and 4-HRS network with 700 kg trailers, 3 filling ramps, driver shifts, stochastic travel/consumption, Visual Logic dispatch, and a 10-trailer plus 4+1 parking recommendation.

Institut NeuroPSI and CentraleSupélec — Paris-Saclay, France
Strain-gauge collision sensing for mouse prosthetic arm — *Feb 2024 - Jun 2024*
- Validated strain-gauge tactile sensing using Wheatstone-bridge/HX711 acquisition, 2- vs 4-gauge S/N comparison, 1 mm static steps, linear regression, and servo-motor dynamic tests.

Sup'ISI Tétouan — Tétouan, Morocco
Academic support internship - SQL e-learning content — *03 Jul 2023 - 11 Aug 2023*
- Produced 15 SQL correction videos for 7 practical exercises using WampServer, phpMyAdmin, and Camtasia, with step-by-step relational reasoning.

Academic / Personal Projects

RoutenSim / MILEX | *FastAPI, Python, C++, Gurobi, PyTorch Geometric, React, DeckGL*
- Travel-time dependent pickup-and-delivery optimizer combining Operations Research with graph ML; selected the best-performing model after 100-run evaluation with 3.99 min MAE, rho=0.960, and 90.7% peak-hour accuracy.

FlexSched | *Python, FastAPI, Genetic Algorithm, MILP, Gurobi, React, Plotly*
- Production scheduling optimizer for flexible bag manufacturing across 14 parallel machines, handling sequence-dependent changeovers, capacity constraints, deadlines, simulation, and Gantt visualization.

Local-First Desktop RAG System | *Tauri 2, Rust, Axum, Tokio, SQLite, Python, LightRAG, PyTorch, Ollama*
- Local-first desktop RAG with Rust orchestration and Python ML services; combines LightRAG with T-Retriever and HFR for hierarchy-aware retrieval, reranking, and incremental insertion.

Technical Skills

Systems Engineering: Mathematical programming, Metaheuristics, Combinatorial optimization, Stochastic optimization, Gurobi, OR-Tools
Modeling / Simulation: Process modeling, System modeling, Discrete-event simulation, Digital twins, FlexSim, Simul8, Simulink, Node-RED
Machine Learning: Python, PyTorch, TensorFlow, scikit-learn, PyTorch Geometric, Transformers, NLP / LLMs, Google Cloud Console
Data Science / Analytics: Python, SQL (MySQL), Supabase, Pandas, NumPy, SciPy, Matplotlib, Plotly, Power BI
Cloud: Google Colab, Google Cloud Console, Google Cloud Storage, Kaggle, AWS Bedrock
AI Coding Tools: Claude Code, Codex
Deployment: Railway, Vercel

Engineering Competencies, Certifications, Languages

Engineering Skills: Scope definition, Planning and scheduling, Stakeholder coordination, Scrum, Scenario analysis, Sensitivity analysis, Risk mapping, Mitigation planning, Lean Manufacturing, Six Sigma, KPI definition, Root-cause analysis, Process mapping, Capacity planning, Resource allocation, Flow optimization
Certifications: Deep Learning Specialization; DeepLearning.AI TensorFlow Developer; Modern Robotics: Mechanics, Planning, and Control; Programming the Internet of Things; Inferential Statistics; Scrum Master Certification; Google Project Management
Languages: Arabic Native; French C1 - Professional; English C1 - Professional, TOEIC 965