Mohamed Abdelhakim RAHAI

AI Engineering Student • Data Science & Optimization

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Third-year AI engineering student at ENSIA applying search, optimization and statistical methods to real-world problems: founder of **Waymark**, a retail-analytics startup supported by ENSIA's AI incubator, and co-builder of a timetabling optimizer run on the school's real data. Leads teams as Head of IT at an entrepreneurship club (events with 60+ companies) and on two course projects.

PROJECTS

Waymark — Founder | *Retail POS & analytics startup, ENSIA V2V incubator* **2026 – Present**

- Turned interviews with 4 retailers, who ranked expiry losses and inaccurate stock among their biggest problems, into a local-first POS and analytics product for small and medium stores; first pilot scheduled for Nov 2026.
- Shipped the offline-first till (C#/.NET, Avalonia, SQLite) with keyboard-only checkout and an Arabic interface; Admin app (React/TypeScript) about 50% complete.
- Made expiry alerts work from day one, with no sales history needed, by designing FIFO-by-batch inventory; chose interpretable OR and statistics over black-box ML so every recommendation can be explained to the retailer.
- Kept analytics outside personal-data scope by aggregating in-store, backed by a data-protection impact assessment under Algerian Law 18-07. *Private repo — demo on request.*

Course-to-Room Allocator — Team of 6 | *Python, CSP, metaheuristics* **GitHub**

- Produced a feasible timetable for ENSIA's real course data that beat the school's current assignment on every soft-constraint metric (student travel, schedule gaps, . . .) by combining CSP initialization with local search; Simulated Annealing outperformed Hill Climbing and Tabu Search; benchmarked on ITC2007.
- Implemented all 9 soft constraints and both objective functions, and fixed a cost-scale mismatch between penalty terms; managed the repository.

Horizon — Forecasting & Statistical Learning Pipeline | *Python, Polars, statsmodels* **2026**

- Unified pipeline taking raw data to validated forecasts and models behind one interface: naive, drift, ETS and ARIMA with automatic order selection and residual diagnostics (Ljung–Box); Lasso, smoothing splines and GAMs.
- Fixed bugs that silently bias results (double differencing, CV leakage, mis-scaled regularization, GAM identifiability).

LEADERSHIP & ACTIVITIES

EBEC — ENSIA Business & Entrepreneurship Club **2026 – 2027**
Head of IT Department *ENSIA, Algiers*

- Lead a 15-member IT team for a 9-event annual program, including **Ignite** (60+ companies meeting students), the **Fikratech** hackathon and the **Data2Venture** 3-day datathon.
- Own the events' tech: websites, registration, partner tech coordination, badges, datathon datasets and review; delivered the Open Day game platform.

Course Project Team Lead — ENSIA **2026 – 2027**

- **Proffer** (team of 3): leading a mobile app that helps freelancers manage leads, quotations, follow-ups and payments.
- **Software Engineering project** (team of 6): leading the team's semester-long software project.

Algerian Muslim Scouts (SMA) **2017 – 2024**
Member — seven years organizing and supporting group activities and events

EDUCATION

ENSIA — National School of Artificial Intelligence **2024 – 2029 (expected)**
State Engineering Diploma in Artificial Intelligence (5-year program), currently Year 3 *Algiers, Algeria*
Year 2: **15.14/20 (A)** • Year 1: 13.35/20 (C)
Coursework: Statistical Inference, Data Mining, Artificial Intelligence, Decision Analysis, Databases, Software Engineering, Operating Systems

Baccalauréat — Mathematics **2024**
18.24/20 — top 0.33% nationally (about 2,800 of 860,000 candidates scored 18 or above)

SKILLS

Programming: Python, Java, C#, TypeScript, SQL
Data & Optimization: Polars, statsmodels, Google OR-Tools, DuckDB; metaheuristics (SA, Tabu, Hill Climbing), CSP, time-series forecasting (ETS, ARIMA), statistical learning (Lasso, splines, GAMs), hypothesis testing, decision analysis
Software & Tools: .NET / Avalonia, React, SQLite, PostgreSQL, concurrency (Java threads), Git / GitHub, LaTeX
Languages: Arabic (native), English (C1), French (B2)
Interests: Football (registered with a regional club, ages 10–16) • Software engineering • Software modeling