Amine Athmani, PhD



Lead Optimization Scientist | Operations Research & Data Science

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SUMMARY

Operations Research scientist and technical lead with 6+ years taking optimization products from **problem framing** to **modeling**, **implementation** and **production**. PhD in AI & Operations Research (UTT) on production scheduling and Computer Science Engineer (ESI Algiers). Builds workforce scheduling, rostering, routing and supply chain solutions with **MILP/MIP (CPLEX, Gurobi)**, **constraint programming (CP Optimizer, OR-Tools)**, **metaheuristics (Timefold, Hexaly)** and **machine learning** in **Python**, shipped as containerized APIs on cloud platforms. Leads solver teams, client workshops and presales.

CORE SKILLS

Operations Research: MILP/MIP, Constraint Programming, Vehicle Routing (VRP, pickup & delivery, time windows), Production & Machine Scheduling, Rostering, Timetabling, Supply Chain & Logistics, Demand-driven Planning, Resource Allocation, Network Optimization, Decomposition, Replanning, Metaheuristics

Solvers: IBM CPLEX, IBM CP Optimizer, Gurobi, Google OR-Tools (CP-SAT), Hexaly, Timefold / OptaPlanner, Pyomo, HiGHS, CBC

Data Science & ML: Python, SQL (PostgreSQL, Supabase), pandas, NumPy, scikit-learn, XGBoost, PyTorch, predictive modeling, algorithm selection & tuning, KPI design, benchmarking, LLM agents

Engineering: Java, C/C++, Rust, TypeScript, FastAPI, REST APIs, Docker, Kubernetes, Azure, IBM watsonx.ai, AWS, CI/CD, Git, Linux

Leadership: Technical team leadership, client workshops, presales & proposals, solution architecture, training & public speaking

PROFESSIONAL EXPERIENCE

Senior Optimization Consultant Aug 2026 – Present
Optacare – Healthcare workforce planning software for hospitals *France (Remote)*

- Designed and shipped the **real-time replanning engine** of a nurse-rostering platform, repairing hospital rosters after absences with minimal disruption.
- Modeled it as a large-scale **MILP in IBM CPLEX** (millions of constraints, solved in seconds) and **cut roster changes by ~40%**.
- Delivered as a **FastAPI** microservice on **IBM watsonx.ai** with Docker and CI; defined features and requirements with the product team.

Senior Optimization Consultant – Technical Lead Mar 2024 – Present
Dots & Lines – Optimization & AI consultancy *Strasbourg, France*

- **Avinor** (Norwegian airport & air navigation operator): lead solver engineer on the production demand-driven shift design and rostering service for 100+ air-traffic controllers, using **Timefold** and **MIP** on **Kubernetes/Azure**.
- **Supply chain:** designed a crude-oil logistics optimizer coupling a **blending MILP** with a **pickup-and-delivery VRP** through decomposition and rolling-horizon replanning.
- Led **VibeSolve**, an open-source **LLM agent** pipeline generating solvers from plain English, and an **interview-scheduling optimizer** (Timefold, calendar integrations).

R&D Engineer, Optimization (Industrial PhD) Nov 2020 – Dec 2023
Adesoft – Scheduling & timetabling software for universities and companies *Paris, France*

- Built a scheduling and **resource allocation** engine assigning rooms, teachers and equipment to courses and training for universities and large companies.
- Developed **CP Optimizer**, **Gurobi MILP** and **OR-Tools** models and a decomposition-based solver validated on real university data.
- Researched **ML-guided production scheduling**, published at GECCO and META and open-sourced in **pyscheduling**.

Research Intern, Machine Learning for Optimization Sep 2019 – Sep 2020
LIST3N Lab – Université de Technologie de Troyes *Troyes, France*

- Developed **ClusterTune**, an ML-based metaheuristic tuner needing an order of magnitude less tuning effort than exhaustive methods.

EDUCATION

PhD in Computer Science – AI & Operations Research Nov 2020 – Dec 2023
Université de Technologie de Troyes (UTT), industrial thesis with Adesoft *Troyes, France*

Thesis: *Learning-based Approaches for Parallel Machines Scheduling Problems.* Production scheduling with CP Optimizer, metaheuristics, and predictive ML models (XGBoost) for tuning and algorithm selection.

Engineering Degree & MSc in Computer Science (Computer Systems) 2015 – 2020
École nationale Supérieure d'Informatique (ESI ex-INI), top 10% of class *Algiers, Algeria*

SUSI Fellow – Entrepreneurship and Economic Development 2019
University of Massachusetts Amherst (U.S. Department of State program) *Amherst, MA, USA*

PUBLICATIONS & OPEN SOURCE

- Athmani, Arbaoui, Mimene, Yalaoui. *Efficient heuristics and metaheuristics for the unrelated parallel machine scheduling problem with release dates and setup times.* GECCO 2022, ACM.
- Arbaoui, Athmani, Henni, Laissaoui, Terzi. *PyScheduling: an extensible and user-friendly Python framework for scheduling problems.* GECCO 2023 Companion, ACM.
- Athmani, Arbaoui, Yalaoui. *Learning instance tunability for parallel machine scheduling problems with release dates and setup times.* OLA 2023.
- Athmani, Arbaoui, Yalaoui. *ClusterTune: tuning metaheuristics using clustering for scheduling problems.* META 2021.
- Athmani et al. *A constraint programming approach for solving the unrelated parallel machine scheduling problem with release dates and setup times.* Presented at CPAIOR 2022.
- Open source: **pyscheduling** (github.com/scheduling-cc/pyscheduling) and **VibeSolve** (github.com/vibesolve/vibesolve).

TEACHING, LEADERSHIP & AWARDS

- **Award winner, Optimization Grand Challenge 2026**; 3rd place, AI Hack Tunisia (2019); competitor, International Timetabling Competition 2021.
- Workshop speaker, **Optimization4All** (2026): *Optimising Schedules: A Hands-On Guide to Modern Algorithms*, MIP (Pyomo, HiGHS) vs. metaheuristics (Timefold) with live demos.
- Lecturer at UTT (2020–2023): C and Python programming, algorithms.
- Lead organizer, Google Developer Group Algiers (2015–2020): led 200+ volunteers, gave 20+ talks; organizer, Hajj Hackathon (2018, Guinness World Record largest hackathon).

LANGUAGES

English (full professional) | French (bilingual, DALF) | Arabic (native)