Hassane AZZI

Software Development Engineer | Operations Research | Optimization | Machine Learning

Mobility: Île-de-France, Toulouse, Bordeaux

Activities: Software Development, Operations Research, Optimization, Machine Learning

LinkedIn | Github | Malt | Research Gate | ENAC Alumni | YouTube | Stack Overflow

Professional Profile

Computer Science Engineer, option: Operations Research & Optimization (M2INFO_RO - 2016) from ENAC (Ecole Nationale de l'Aviation Civile), I apply my expertise in operations research, Machine Learning and software development (C++, Java, Python) to projects across various industrial sectors. My combined scientific and technical skills enable me to develop robust and optimized solutions tailored to challenges of performance, reliability, and operational efficiency.

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06-XX-XX-XX-XX

Experiences

Optimization & Machine Learning Engineer

Naldeo Digital for Climate - Since May 2024 - Temporary Work - Tarnos

As part of a temporary increase in activity for various projects with the Naldeo company, my role during this mission is to support different clients (Omexom, Valorem and Urbasolar) in the development of optimal management solutions for hybrid energy systems in non-interconnected zones (ZNI), in particular overseas departments and regions (Corsica, Martinique, Guadeloupe, Reunion Island and Mayotte). This advanced energy management solution is capable of maximizing the revenues of hybrid power plants, by optimizing production in real time according to the announced program, the actual state of the plant and the updating of production forecasts.

Software Development Engineer | C++ Back-End Developer

SCLE SFE - March 2022 to April 2024 - Full-time - Toulouse - France

For the client SCLE SFE, and within the "Reliability" team, the mission consists of developing a software application (Vcard) for simulating high-voltage substation cards.

Software Engineer (C++/Java)

SEGULA Technologies - December 2018 to February 2022 - Freelancer - Brest

As part of the continuation of the internship carried out in Cherbourg for the E3S (Energy Smart Sailing Ship) project, this assignment involved completing the development phase of the project.

Research & Innovation Engineer

SEGULA Technologies - March 2018 to August 2018 - Internship - Cherbourg

Mission: As part of the E3S (Energy Smart Sailing Ship) project led by the Naval Engineering and Energy Research & Innovation Unit at SEGULA Technologies, the objective of this mission was to implement a hybrid intelligent energy management system (EMS) capable of managing the production and consumption flows of electric energy on board a long-distance cruising sailboat.

The sailboat is equipped with renewable energy sources (solar panels, wind turbines, a hydrogenerator, a diesel generator, and a battery bank) installed on board, ensuring safety during navigation and maximum comfort for passengers (air conditioning, internet, television, shower, etc.).

Operations Research Developer (Student Project)

École Nationale de l'Aviation Civile (ENAC) - October 2016 to January 2017 - Student Project - Toulouse

Project: resolution of air traffic conflicts using exact and approximate methods (metaheuristics).

In air traffic management, separation distances must be respected to avoid any risk of collision between aircraft. Two aircraft are considered to be in conflict if the distance separating them is less than 5 nautical miles (NM) horizontally or 1,000 feet (ft) vertically. In other words, an air conflict corresponds to a loss of separation between two or more aircraft that find themselves too close to each other, in violation of predefined safety standards. The resolution of air conflicts is based on the implementation of avoidance maneuvers, such as changes in speed, altitude, or heading, in order to reestablish minimum separation distances. Each maneuver generates a cost, particularly in terms of kerosene consumption, depending on its nature. The objective of this project is precisely to minimize the total cost of maneuvers applied to aircraft, while ensuring compliance with safety standards.

Scheduling of landings at an airport

École Nationale de l'Aviation Civile (ENAC) - October 2016 to January 2017 - Student Project - Toulouse

Airport traffic management poses many optimization challenges, making air traffic difficult to predict. In this context, assigning parking stands to aircraft, finding optimal landing sequences on one or multiple runways, as well as planning strategic taxi routes are major issues for air navigation services.The goal of this mini-project is to develop a flight sequencing strategy for arrivals at airports to avoid congestion caused by closely spaced aircraft arrivals.

One-Class Support Vector Machine (1-class SVM)

ISAE-SUPAERO - October 2016 to January 2017 - Student Project - Toulouse

This project aims to develop and implement a Machine Learning algorithm able to detecting anomalies in a system, using novelty detection and outlier detection techniques.

Modeling and Solving Industrial Optimization Problems Using Solvers (3-day training at ENAC)

École Nationale de l'Aviation Civile (ENAC) - December 2016

- Case study and application to solve real-world industrial problems: Crew Pairing Problem (CPP), Crew Scheduling Problem (CSP), Capacitated Vehicle Routing Problem (CVRP, CVRPTW)
- Modeling and solving optimization problems using solvers
- **Technical Environment**: IBM ILOG CPLEX Optimization Studio, LocalSolver, Pyomo, Mathematical Modeling, Combinatorial Optimization, Linear Programming

Skills

Operating systems (OS)
Linux (Ubuntu, Debian, Red Hat), Windows, Unix

Programming Languages
C/C++, Rust, Java, Python, Javascript, SQL, CSS, HTML

Frameworks
- Spring Boot, Hibernate, STL, Boost, Qt6, QML, MLflow
- NumPy, Pandas, SciPy, PuLP, Matplotlib, Scikit-Learn, Tensorflow, Apache Airflow

Parallel and High-Performance Computing
MPI, OpenMP, CUDA

Integrated Development Environments (IDE)
Eclipse, Netbeans, IntelliJ IDEA, Qt Creator, Visual Studio Code, PyCharm

Continuous integration (CI/CD) / DevOps tools
Git, GitLab CI, GitHub, Jenkins, CMake, Maven, Ansible

Software Testing and Quality (TDD, BDD)
SonarQube, Cucumber, CppUnit, Google Test, JUnit, Mockito, Pytest

Microservices and Cloud Computing
Docker, Kubernetes, Apache Kafka, API REST, GraphQL, AWS, Azure, Google Cloud Platform (GCP)

Databases (SQL and NoSQL)
SQL Server, MySQL, Oracle, PostgreSQL, MongoDB

Scientific Computing /Solvers
MATLAB/ Simulink, GLPK, Gekko, Pyomo, IBM ILOG CPLEX Optimization Studio

Networks, Protocols & Software Standards
CAN, MQTT, TCP/IP, DO-178, ED-109, ED-12C, ARINC 429

Office Tools and Scientific Writing Software
LaTeX, Beamer, Microsoft Word, Excel, PowerPoint, Outlook.

Soft Skills
Autonomy, Communication, Leadership, Teamwork

Methodology
Agile Scrum, Kanban, SAFe, V-Model methodology

Education

Applied Data Science

Columbia Engineering & Emeritus Institute of Management
January 2019 to May 2019
Training in Data Science and Machine Learning:
-Data analysis and visualization;
-Use of Python Frameworks (NumPy, Pandas, Scikit-Learn, Matplotlib);
-Study of some Machine Learning algorithms: Random Forest, Text Mining, Linear Regression, Decision Trees, K-Means, SVM, Gradient Descent, Neurals Networks.

Master's degree in Computer Science: Operations Research & Optimization (M2INFO_RO)

ENAC | ENSEEIHT | ISAE-SUPAERO | INSA | Université Toulouse III - Paul Sabatier
September 2016 to September 2018
A master's degree in Operations Research (M2RO) at ENAC (École Nationale de l'Aviation Civile) is a high-level program specializing in modeling, optimization, operations research and the solving of complex problems related to transportation, aeronautics, logistics, and other industrial sectors.

Modules & courses
Applied Mathematics · Operations Research · Optimization · Mathematical modeling · Linear programming · Combinatorial Optimization · Mathematical Programming · Graphs and networks · Optimization applications in the air transportation · Constraint programming · Optimization under uncertainty · Algorithmic complexity · Air Traffic Management (ATM) · Machine Learning Algorithms

Languages

English ★★★★☆
Fluent (Level B2/C1, TOEIC 864: reading, writing and speaking)

French ★★★★★
Bilingual (Level C2 of the CEFR, TCF 667: Reading, writing and speaking)

German ★☆☆☆☆
Lower-intermediate (Level B1 of the CEFR)

Interests

Arts

Chess games

Sports

Swimming, Jogging

Conferences and events

sep. 2021 - déc. 2022 · 1 an - Professional Mentor for ENAC Alumni (Volunteer)
As a member of the ENAC Alumni Association, I volunteered to support new graduates as well as current students in refining their academic or career plans.

Certifications

Discrete Optimization (Georgia Institute of Technology)
(View certification)

Recherche opérationnelle: optimiser ses décisions (University of Montreal)
(View certification)

Introduction to Optimization Through the Lens of Data Science (Part 1 to 4) 11/2024
(View certification)

Mathematics for Machine Learning (Specialization) 2025
(View certification)

Machine Learning Specialization (Stanford University)
(View certification)

Advanced Learning Algorithms (Stanford University)
(View certification)

Supervised Machine Learning: Regression and Classification (Stanford University)
(View certification)

Machine Learning (Columbia University)
(View certification)

Machine Learning with Python (IBM)
(View certification)

Operations Research: an Active Learning Approach (The Hong Kong Polytechnic University)
(View certification)

optimizationX-1: Optimization: principles and algorithms - Linear optimization
(View certification)

optimizationX-2: Optimization: principles and algorithms - Network and discrete optimization
(View certification)

optimizationX-3: Optimization: principles and algorithms - Unconstrained nonlinear optimization
(View certification)

Mathematical Optimization for Business Problems
(View certification)

Mathematical Optimization for Engineers
(View certification)

Artificial Intelligence: Optimization Algorithms in Python
(View certification)

Optimization with Python: Complete Pyomo Bootcamp A-Z
(View certification)

Operations Research & Optimization Projects With Python
(View certification)

Optimization with Python: Solve Operations Research Problems
(View certification)

Pyomo Bootcamp: Python Optimization from Beginner to Advance
(View certification)

Python for Data Science
(View certification)

Linux Commands & Shell Scripting Basics
(View certification)

Software Architecture Foundations
(View certification)

Complete Modern C++ (C++11/14/17)
(View certification)

Devenir développeur C++
(View certification)

Modern C++: Advanced Techniques and Features
(View certification)

Initiation à la programmation (en C++)
(View certification)

Introduction à la programmation orientée objet (en C++)
(View certification)

Parallel and Concurrent Programming with C++ Part 1
(View certification)

Parallel and Concurrent Programming with C++ Part 2
(View certification)

Test-Driven Development in C++
(View certification)

C Essential Training
(View certification)

Devenir développeur Java
(View certification)

Practical Test-Driven Development for Java Programmers
(View certification)

LEARNING **Advanced Python**
(View certification)

LEARNING **Unit Testing and Test Driven Development in Python 2024**
(View certification)