

ABDELMALEK RHAYOUTE

Machine Learning Research · Master MVA (ENS Paris-Saclay)

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EDUCATION

ENS Paris-Saclay & Université Paris Cité

Paris, France

M.Sc. Mathematics, Vision & Machine Learning (Master MVA)

2026 – 2027

- Coursework: **Stochastic Calculus in ML**, Generative Models, Time-Series ML, Convex Optimization, Optimal Stopping & Bandits, **Reinforcement Learning**, Extreme Value Risk.

Université Paris Cité

Paris, France

M.Sc. Applied Mathematics — Probability, Stochastic Processes & Modeling

2024 – 2026

- Stochastic calculus, probabilistic modeling, statistical learning, numerical methods for **SDEs**, high-dimensional inference.

ENSEEIH – Toulouse INP

Toulouse, France

Diplôme d'Ingénieur (M.Eng.) – Applied Mathematics & Computer Science (ModIA)

2020 – 2023

- HPC**, numerical analysis, probability & statistics; exchange at **INSA Toulouse**; research with **ISAE-SUPAERO** (cryptography / secure data).

Lycée Moulay Idriss

Fès, Morocco

Classes Préparatoires (CPGE) – Mathematics & Physics (MP)*

2018 – 2020

RESEARCH & ENGINEERING EXPERIENCE

Exiom Partners

Paris, France

Research Intern — Stochastic Modeling & Numerical Methods

2025 – 2026

- Calibrated advanced **stochastic models**; improved numerical accuracy by **15%** vs. baselines.
- Built **Python** frameworks for large-scale simulation, sensitivity analysis, and automated validation on high-frequency data.
- Developed exact & finite-difference **sensitivity estimators**; integrated model-quality monitoring for production use.

Vitesco Technologies

Toulouse, France

Machine Learning Engineer (Apprenticeship)

2022 – 2024

- Designed **CNN-LSTM** / attention models for multivariate **time-series forecasting**; cut prediction error by **20%**.
- Engineered terabyte-scale pipelines with **PySpark**/SQL; Docker training/inference on **AWS** via CI/CD.

SELECTED RESEARCH PROJECTS

GPU-Accelerated Monte Carlo Engine

CUDA / Python / C++

Path-dependent processes, QMC, variance reduction

2024

- Parallel **Monte Carlo** on **GPU**; Sobol/Halton + antithetic/control variates; **30%** lower latency vs multi-threaded CPU.
- Real-time tail-risk estimators for high-dimensional distributions.

Deep RL for Sequential Decisions

PyTorch / NumPy / SciPy

Optimal stopping, exploration–exploitation, sample efficiency

2025 – 2026

- Deep RL & optimal stopping** agents under non-linear costs and constraints.
- Studied exploration–exploitation trade-offs and sample-efficient policy learning in stochastic environments.

C++ Numerical Library (SDEs & PDEs)

C++20 / STL / CMake

Closed-form, trees, finite differences, sensitivities

2024

- Modular solvers with analytical & FD **sensitivities**; strict memory optimization.

TECHNICAL SKILLS & LANGUAGES

- ML:** **PyTorch**, Deep Learning, Time Series, **RL**, Generative Models, Convex Optimization, Bandits, Probabilistic Modeling.
- Math:** **Stochastic Calculus**, Probability, **SDEs/PDEs**, Monte Carlo / QMC, Statistical Inference.
- Code:** **Python** (PyTorch, NumPy, SciPy, Pandas, Numba, CuPy, Scikit-learn), **C++17/20**, **CUDA**, SQL.
- Systems:** Linux, **AWS**, **Docker**, Git, PySpark, CI/CD · **EN** fluent · **FR/AR** native.