# Mariyam Belbachir

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## Profile

Quantitative finance specialist with an experience in risk modeling (FRTB/DRC), derivatives pricing, and statistical methods. Strong background in stochastic calculus, Monte Carlo simulations, and machine learning. Proven ability to develop quantitative models that solve complex financial problems.

## Education

**Sorbonne University / École Polytechnique** — Oct 2024
MSc in Probabilities and Finance (ex-DEA EL Karoui) — Paris, France

- Focused on probability theory, partial differential equations, stochastic calculus, numerical analysis, optimal control, and machine learning applications in finance
- Advanced coursework: Interest rate models, quantitative risk management, options pricing theory, trading algorithms, financial regulations

**Institut National de Statistique et d'Économie Appliquée** — Sep 2019 - Jul 2022
MEng in Quantitative Finance & Actuarial Science — Rabat, Morocco

- Specialized in actuarial science, financial markets, statistics
- Statistical focus: Time series analysis, econometrics, copula theory, insurance, reinsurance

## Technical Skills

**Programming Languages**: Python (NumPy, pandas, SciPy, sklearn), C++, R, MATLAB, SAS, SQL
**Machine Learning**: GLM, Ensemble Methods, Time Series Forecasting
**Tools**: LaTeX, Git, Jupyter, Excel/VBA, Power Point
**Languages**: Arabic (Mother Tongue), English (Fluent), French (Fluent)

## Professional Experience

**Quantitative Research Intern** — Apr 2024 - Oct 2024
Exiom Partners — Paris, France

**FRTB Default Risk Charge (DRC) Concentration Risk Modeling**

- Introducing the *granularity-adjustment* as the concentration risk charge and its evolution against single-name concentration and the long exposures.
- Developed Vasicek-based framework to quantify single-name and sectoral concentration risk under FRTB regulations for several homogeneous portfolios.
- Implemented calibration algorithms in Python and backtested against historical NASDAQ stocks' data

**ALM Modeler Intern** — Mar 2022 - Jul 2022
Banque Centrale Populaire — Casablanca, Morocco

**Term Deposit Renewal & Prepayment Risk Modeling**

- Built ML model (GLM + bagging) predicting deposit renewals with 90% accuracy, optimizing liquidity management
- Developed 30-year prepayment rate forecasts.

## Academic Projects

**Factor Analysis for Portfolio Optimization** — Apr 2024
Sorbonne University — Paris, France

- Implemented PCA and factor analysis on EuroStoxx 50 data, achieving 10% higher Sharpe ratio vs benchmarks
- Developed Python framework for dynamic portfolio rebalancing based on factor exposures

**Merton Jump-Diffusion Model** — Jul 2023
Sorbonne University — Paris, France

- Priced European options under jump-diffusion, analyzing credit spread impact on volatility smiles