

# BIDIAS TIOTSOP

Intern quant researcher

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## Summary

Third year student at École Polytechnique, in the applied mathematics department, with a strong background in statistics, stochastic modeling, time series analysis, and deep learning. Highly motivated to contribute to research in financial mathematics. I am seeking a 4–6 month research internship in quantitative finance and risk modeling.

## Education

### École Polytechnique

*Polytechnique engineer cycle (Applied Mathematics specialization)*

Sep. 2023 – Apr. 2027

Palaiseau, France

- Engineering studies at a top French institution.
- Relevant Coursework : Stochastic calculus, Algorithms analysis, Probability theory, Machine learning

## Experiences

### Quantitative Risk Analyst Intern

*Abeille Assurances (formerly Aviva France)*

Jun. 2025 – Aug. 2025

Paris, France

- Designed and calibrated a Hull–White model for inflation dynamics, ensuring numerical stability and achieving over a 100% improvement in model accuracy, resulting in significantly more reliable projections.
- Implemented a Longstaff–Mithal–Neis (LMN) credit risk model for corporate bonds, leading to improved pricing accuracy with a relative precision gain of 0.01.

### Forex Trading Model Development

Sept 2024 - Apr 2025

*Lusis*

Remote

- Built algorithmic trading models using Random Forest and XGBoost to predict Forex trends across 9 currency pairs obtaining a Sharpe Ratio of 2.96

## Projects

### Mean Field Game of Mutual Cross-Holding | Mathematics Research Project

Sep 2025 - Dec 2025

- Modeled a mutual holding situation through mean field games in discrete time. Analyzed how diversification affects the total system
- Obtained results consistent with literature : optimal diversification reduces shareholder's risk (variance)

### Time Series Classification and Forecasting for Exoplanet Detection | Machine Learning Research Project

Nov 2025

- Implemented a time series classification pipeline using Dynamic Time Warping (DTW) and k-Nearest Neighbors to distinguish transit vs. non-transit events from photometric measurements of exoplanet WASP-126 b using the TESS SPOC Light Curve dataset.
- Developed and trained LSTM and Transformer architectures in PyTorch to forecast future photometric values on the same dataset.

### Portfolio Risk Modeling and Value-at-Risk Estimation | Mathematics Research Project

Apr 2025 - Jun 2025

- Modeled option portfolios (calls and puts) under various configurations and estimated Value-at-Risk using advanced Monte Carlo techniques, including importance sampling, last particle methods, and multilevel splitting.
- Leveraged autoregressive Markov chains to simulate conditional distributions, enabling the implementation of last particle and multilevel splitting algorithms for high VaR percentile estimations

## Quantitative Finance & Data Science Challenges

### Citi Group | Market Quantitative Analyst job simulation

Sep 2025

- Modeling and pricing of future contracts and options on cofee via Black-Scholes and Monte-Carlo simulations
- Application of hedging strategies and of risk management for structured products on financial markets

### Ecole polytechnique - via Kaggle | Influencer or observer - predicting social roles

Dec 2025

- Designed a model to predict wether a tweet originated from an observer or from an influencer
- Used Transformers to embed the textual data and CatBoost for classification, obtained 84.1% of accuracy

## Technical Skills

**Languages:** Python (NumPy, SciPy, Pandas, Matplotlib, scikit-learn, Pytorch), Java

**Developer Tools:** VS Code, Eclipse, GitHub

**Financial modeling:** interest rate models (Vasicek, Hull-White, CIR) and volatility models (GARCH)

**Numerical simulation :** Monte Carlo, Euler–Maruyama, Milstein scheme

## Personal interests

**Hobbies:** Sport (Member of the basketball team at École Polytechnique, dedicating approximately 6 hours per week).

**Association:** Member of the student association X-Afrique (dedicated to promoting African culture on the campus).