

# Mike Silva

Paris, France | +33 6 52 08 20 69 | [silva.mike125@gmail.com](mailto:silva.mike125@gmail.com)

**Academic Interests:** My academic interests include Stochastic Analysis, Statistical Physics, Computational Science, Machine Learning, Macroeconomics & Multi-agent Models.

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## Education

### Sorbonne Université

2021 – 2026

#### Master's in Mathematics & Physics

Probability & Statistics, Functional Analysis, Advanced Quantum Mechanics, Statistical Physics, Computational Physics, High Energy Physics, Condensed Matter Physics, Stochastic Modelling for Finance, Computational Statistics and Machine Learning, Numerical Optimization. Information Theory.

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## Professional Experience

### Dauphine PSL

Sep 2024 – Jan 2025

#### Research Internship in Applied Mathematics

Introduction to mean-field game theory applied to economics for the study of the propagation of monetary shocks in a general equilibrium economy with sticky prices, under the supervision of Pierre Cardaliaguet.

*This internship involved both theoretical and computational work. I studied the analytical structure of mean-field models in continuous time, implemented numerical simulations for price adjustment dynamics, and explored applications to monetary policy transmission in DSGE frameworks.*

- Analysis of partial differential equations and mean-field equilibria
- Familiarity with the literature on rational inattention and sticky prices

### Sciences Po Paris

Jun 2023 – Aug 2023

#### Research Internship in Political Economics

"Hosting Media Bias: Evidence from the Universe of French Broadcasts" under the supervision of Julia Cagé.

*I contributed to the construction and analysis of a large dataset of French TV programs, focusing on political content. My tasks included data cleaning, matching broadcast data with political affiliation indicators, and estimating the impact of media ownership on content bias using econometric tools.*

- Data cleaning and preprocessing of large-scale datasets in Python and Stata
  - Matching algorithms and text-based classification of political content
  - Collaboration on academic writing and discussion of empirical strategies
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## Projects

### Agricultural Concentration and Pesticide Use

May 2025

Under the supervision of Stéphane Gauthier, University Paris 1 Panthéon Sorbonne.

### Information Theory and Statistical Mechanics according to E. T. Jaynes

May 2024

Under the supervision of Alice Sinatra and Fabio Pietrucci, Sorbonne University.

### Simulation of N-body Self-gravitating Systems and Spatial Light Modulator

Feb 2024

Under the supervision of Lionel Foret and Alban Urvoy, Sorbonne University.

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## Skills and Languages

- Python, C++, R
- Stochastic calculus, Time series analysis, Monte Carlo simulations, VaR, CVaR, Black-Scholes
- Supervised and unsupervised learning, reinforcement learning, neural networks, CNNs, RNNs, NLP
- Pandas, Numpy, Matplotlib, Seaborn, Scikit-learn
- TensorFlow, Keras, PyTorch, XGBoost, LightGBM
- High-frequency trading, algorithmic execution strategies, backtesting frameworks