Yuguang XIAO

Student of Mathematics and Physics
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EDUCATION

Sorbonne University co-qualified with École Normale Supérieure, Paris (ENS) *in Paris, France*
M2 Probability and Random Models (M2 PMA) with major : Stochastic Processes *Sept. 2025 – present*

- Stochastic Calculus; Markov processes and models; Poisson Clouds, Excursions, and Lévy Processes; Process Convergence, Large Deviations, and Percolation; (Second semester electives to be chosen)

Sorbonne University *in Paris, France*
M1 Mathematics and Applications (M1 MATHS) *Sept. 2024 – Sept. 2025*

- Advanced Probability, Statistics, Functional Analysis and Calculus of Variations, Stochastic Calculus and Introduction to Stochastic Control, Research Project (T.E.R.)

Sorbonne University *in Paris, France*
Double Bachelor 1–3 in Physics and Mathematics (MATHS-PHYS) *Sept. 2020 – Sept. 2024*

- Measure Theory, Functional Analysis, Algebra, Numerical Analysis, Topology and Differential Calculus, Statistics, Python, Optimization, Research Project (T.E.R.), Optics and Electromagnetism, Quantum Physics, Theory of Relativity, Statistical Physics, Thermodynamics

ACADEMIC ACTIVITIES

Separated Nets in Banach Space with Bi-Lipschitz Maps, report and slides
Encadrant: Alexandros ESKENAZIS *End of Jan. 2025 – End of May 2025*

- Gromov's question: Is it true that any two **Separated Nets** in the same Euclidean space are bi-Lipschitz equivalent?
- Counterexample to Gromov's question.
- The statement is true in infinite-dimensional Banach spaces.

Study of a Collective Motion Model, report and slides
Encadrant: Diane PEURICHARD *Jan. 2024 – May 2024*

- Theoretical analysis of the model: solutions, tri-zonal model, and energy dissipation.
- Implementation and numerical simulation with real-time visualization.
- Study of parameter effects on patterns and interactions.

Simulation Model of Satellite and Moon Trajectories in Python, report
Encadrant: Nicolas RAMBAUX *Jan. 2023 – May 2023*

- Developed a three-body model using RK4 method to simulate 3D trajectories.
- Parameter tuning and three-week forecast compared to actual satellite trajectories.
- Time step optimization for maximum accuracy.

COVID-19 Epidemic Spread Model in Python
Encadrant: Dirk STRATMANN *Sept. 2021 – Nov 2021*

- Simulated COVID-19 data over two weeks with parameter fitting.
- Forecasted infected cases for the following week.

EXPERIENCE

Private Mathematics Tutor
Bachelor of Science Student at École Polytechnique *Sept. 2023 – present*
Tutoring in analysis and linear algebra for undergraduate (first-year) students.

SKILLS

Languages: Chinese (native), French (B2), English (B1)
Programming: Python (proficient), C/C++ (intermediate), R (basic), LaTeX (proficient)