

# Ibrahim Kaddouri

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📄 [kaddouriibrahim.github.io](https://kaddouriibrahim.github.io)

Born on the 15th of september 1998

## Education

- 2022–2025 **Université Paris-Saclay, Laboratoire de Mathématiques d'Orsay**, Orsay, France.  
*Doctoral studies, Under the supervision of Elisabeth Gassiat and Zacharie Naulet*  
*Thesis subject: Inference on dependent data with a specific focus on Hidden Markov Models and preferential attachment random graphs.*
- 2021–2022 **Université Paris-Saclay**, Orsay, France.  
*Master of science, Mathematics of randomness: Probability, Statistics and Machine learning*  
*Relevant courses: Brownian Motion and Stochastic Calculus, Statistical learning theory, Reinforcement learning, Sequential learning and optimization, Random matrix theory.*
- 2018–2022 **CentraleSupélec**, Gif-Sur-Yvette, France.  
*Diplôme d'ingénieur, equivalent of a master's degree, Université Paris-Saclay.*  
*Relevant courses: Advanced Statistics, Machine Learning, Advanced Probability, Game Theory, Discrete Optimization, Distributions and Partial Derivative Equations, Mathematical Modeling of Financial Markets and Risk Management.*

## Research and Work experience

- 2023–2025 **Organizer of the students' seminar, Laboratoire de Mathématiques d'Orsay**, *In charge of organizing the masters' students seminar.*
- 2022–2025 **Teaching assistant, Polytech Paris-Saclay**, *Teaching of general mathematics for first year and second year student at Polytech Paris-Saclay. ~ 64 hours each year.*
- July-Sep 2022 **Research internship, Laboratoire de mathématiques d'Orsay, Université Paris Sacaly**, *Studying the problem of clustering of Hidden Markov dependent data. Supervised by Elisabeth Gassiat and Zacharie Naulet.*
- July-Sep 2021 **Research internship, Numerical Vision Center, CentraleSupélec**, *Penalization through ratio of norms for sparse regression. Theoretical analysis and implementation of different penalization techniques to induce sparsity. Supervised by Emilie Chouzenoux & Laurant Duval.*
- Jan-July 2021 **Data scientist internship, BNP Paribas Cardif**, *Pricing insurance contracts using tree-based machine learning algorithms.*
- Sep-Dec 2020 **Quantitative analyst internship, Société Générale Corporate and investment banking**, *Using machine learning to predict the evolution of future prices, developing statistical analyses of data to validate investment strategies.*
- 2018–2020 **Research project in probability**, *Studying the Hölder regularity of Lévy processes by using the geometric properties (mainly Hausdorff dimension) of the associated random trees. Supervised by Erick Herbin & Pauline Lafitte.*

## Talks and Conferences

- Sep-2022 **Poster at JDSE Conference, Ecole Polytechnique**, Palaiseau, France. *Clustering of parametric Hidden Markov Models.*
- Feb-2023 **Talk at ASCAI workshop, Technical University of Munich**, Munich, Germany. *Clustering of nonparametric Hidden Markov Models.*
- June-2023 **Talk at PMSMA Conference, IMAG lab**, Montpellier, France. *Model-based clustering for nonparametric Hidden Markov Models.*
- Sep-2023 **Poster at StatMathAppli Summer School**, Fréjus, France.

- Feb-2024 **Talk at Pizzama Seminar**, Orsay, France. *Late change-point detection in preferential attachment random graphs.*
- Mai-2024 **Talk at 55èmes Journées de Statistique**, Bordeaux, France. *Clustering of nonparametric Hidden Markov Models.*
- Nov-2024 **Advances in High/Infinite-dimensional Inference (AHIDI2024 Workshop)**, Verona, Italy. *Clustering and classification risks in non-parametric Hidden Markov and I.I.D models.*
- Dec-2024 **SuPerGRandMa Séminar**, Orsay, France. *Detecting adversarial attacks on random samples.*
- Dec-2024 **2024 IMS International Conference on Statistics and Data Science (ICSIDS)**, Nice, France. *Fundamental limits for change-point detection under the preferential attachment random graph model (Winner of the Student travel award).*

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## Publications & preprints

**Model-based clustering using Nonparametric Hidden Markov Models**, With Elisabeth Gassiat and Zacharie Naulet. *arXiv:2309.12238..*

**On the impossibility of detecting a late change-point in the preferential attachment random graph model**, With Elisabeth Gassiat and Zacharie Naulet. *arXiv:2407.18685* (To appear in Bernoulli).

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## Skills

PYTHON(advanced), R(medium), MATLAB(medium), C++(beginner), SQL, Github

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## Languages

Arabic (*native*), French (*fluent*), English (*proficient*), Spanish (*beginner*)

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## Awards

French government scholarship (2018-2021)

ICSIDS 2024 Travel Award

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## References

Elisabeth Gassiat : [elisabeth.gassiat@universite-paris-saclay.fr](mailto:elisabeth.gassiat@universite-paris-saclay.fr)

Zacharie Naulet : [zacharie.naulet@universite-paris-saclay.fr](mailto:zacharie.naulet@universite-paris-saclay.fr)

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## Professional service

Reviewer for Electronic Journal of Statistics (EJS)

Reviewer for COLT