

# Hugo Lebeau

hugo.lebeau@univ-grenoble-alpes.fr • [hugolebeau.github.io](https://hugolebeau.github.io) • (+33) 624 687 985  
French, born in Amiens, 26 years old

*Family and environmental considerations influence my career choices.*

## Research topics (PhD)

My PhD work is based on the **theory of large random matrices**, which serves as a tool to provide insights into complex clustering tasks such as data stream clustering, multi-view clustering and time-varying clustering. I am also interested in the study of **large random tensors** and their low-rank approximations.

## Education

- 2021 – 2024    **Université Grenoble Alpes** – Laboratoire d’Informatique de Grenoble, France  
*PhD* – Random Matrix Theory for Structured Learning Models  
“Teaching in Higher-Education” track.  
Supervision: Romain Couillet, Florent Chatelain.
- 2020 – 2021    **ENS Paris-Saclay** – Gif-sur-Yvette, France  
*Master MVA* – Mathematics, Vision and Learning  
With honors of the jury.
- 2017 – 2021    **ENSTA Paris** – Palaiseau, France  
*Diplôme d’Ingénieur* – Applied Mathematics, Optimization and Data Science  
Ranked in the top 5% among 150 students.

## Publications

- 2024    **A Random Matrix Approach to Low-Multilinear-Rank Tensor Approximation**  
Hugo Lebeau, Romain Couillet, Florent Chatelain.  
Submitted to *Journal of Machine Learning Research (JMLR)*.
- 2024    **Performance Gaps in Multi-view Clustering under the Nested Matrix-Tensor Model**  
Hugo Lebeau, Mohamed El Amine Seddik, José Henrique De Morais Goulart.  
Submitted to *International Conference on Learning Representations (ICLR)*.

- 2023 **HOSVD Tronquée : Analyse d'une Approximation Tensorielle Rapide**  
Hugo Lebeau, Romain Couillet, Florent Chatelain.  
*Colloque GRETSI.*
- 2022 **Une analyse par matrices aléatoires du clustering en ligne : comprendre l'impact des limitations en mémoire**  
Hugo Lebeau, Romain Couillet, Florent Chatelain.  
*Colloque GRETSI.*
- 2022 **A Random Matrix Analysis of Data Stream Clustering: Coping With Limited Memory Resources**  
Hugo Lebeau, Romain Couillet, Florent Chatelain.  
*International Conference on Machine Learning (ICML).*

## Research experience

- April 2021 – September 2021 **Research Internship in Machine Learning** – GIPSA-lab, UGA  
Supervision: Romain Couillet, Florent Chatelain.  
Analysis of online learning using random matrix theory.
- March 2020 – July 2020 **Research Internship in Image Processing** – CEA, Saclay, France  
Supervision: Antoine Drouart.  
Implementation of proximal algorithms to improve the quality of industrial neutron imaging.
- May 2019 – June 2019 **Research Internship in Statistics** – Politecnico di Milano  
Supervision: Laura Maria Sangalli.  
Statistical and numerical methods for functional data on complex multidimensional domains.

## Teaching experience

- Spring 2022 – 2023 **Teaching assistant, Random Matrices and Learning (ENS Paris-Saclay, Master MVA)**  
Graduate level – 9 hours  
Introduction to the theory of large random matrices and their applications to machine learning.
- Fall 2021 – 2023 **Teaching assistant, INF103: Introduction to Artificial Intelligence (UGA)**  
Undergraduate level – 18 hours  
Introduction to basic concepts of machine learning: datasets, classifiers, training, performance evaluation, data processing.

- Spring 2023     **Teaching assistant, STA401: Statistics and Probabilities (UGA)**  
Undergraduate level – 18 hours  
Basics of probabilities, standard probability laws, descriptive statistics, estimation, hypothesis testing.
- Fall 2022     **Teaching assistant, Introduction to Machine Learning (Grenoble INP, ENSE<sup>3</sup> & Master MARS)**  
Graduate level – 18 hours  
Overview of the main tools in machine learning: model assessment, discriminant analysis, PCA, GLM and penalization, clustering with EM and  $k$ -means, trees and random forests, deep learning.
- Spring 2022     **Teaching assistant, INF201: Functional Programming (UGA)**  
Undergraduate level – 36 hours  
Introduction to functional programming with OCAML.

## Industry experience

- September 2019 – February 2020     **AXA Climate (Data Scientist Internship)** – Paris, France  
Weather data modeling and risk assessment for parametric insurance pricing.
- August 2018     **Hotel Mikazuki (Internship)** – Katsuura, Japan  
Daily bed-making.

## Talks and tutorials

- June 2023     Truncated HOSVD: A Random Matrix Analysis  
*INFORMS APS Conference*
- November 2022     A Random Matrix Analysis of Data Stream Clustering: Coping With Limited Memory Resources  
*3IA Doctoral Workshop*

## Technical skills

### Programming languages

Proficient in: Python

Familiar with: R, MATLAB, C, C++, OCaml

### Software

LaTeX, Git

**Languages**

English (fluent), French (mother tongue), German (B2), Japanese (A2)

**Other interests**

I love trail running and regularly practice triathlon (swimming, cycling, running). I enjoy hiking and play the piano at a basic level, mostly for myself.