Hugo Lebeau

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Family and environmental considerations influence my career choices.

Experience

Research

Inria, ENS Lyon (OCKHAM Team) — **Lyon, France**
Postdoctoral Researcher — *Feb. 2025–Jan. 2027*
Theoretical study of compressive learning models.

Université Grenoble Alpes (LIG & GIPSA-lab) — **Grenoble, France**
Doctoral Researcher — *Oct. 2021–Jan. 2025*
Theoretical study of machine learning techniques with random matrix theory.

Université Grenoble Alpes (GIPSA-lab) — **Grenoble, France**
Research Intern — *Apr. 2021–Sep. 2021*
Analysis of online learning with random matrix theory.

CEA — **Saclay, France**
Research Intern — *Mar. 2020–Jul. 2020*
Proximal algorithms to improve the quality of industrial neutron imaging.

Politecnico di Milano — **Milan, Italy**
Research Intern — *May 2019–Jun. 2019*
Statistical and numerical methods for functional data on complex multidimensional domains.

Industry

AXA Climate — **Paris, France**
Data Scientist Intern — *Sep. 2019–Feb. 2020*
Weather data modeling and risk assessment for parametric insurance pricing.

Education

Université Grenoble Alpes (MIAI) — **Grenoble, France**
PhD in Applied Mathematics — *2021–2024*
"*Teaching in Higher Education*" track.

ENS Paris-Saclay — **Gif-sur-Yvette, France**
Master MVA (MSc) — Mathematics and Machine Learning — *2020–2021*
With honors of the jury.

ENSTA Paris — **Palaiseau, France**
Diplôme d'Ingénieur (MSc) — Applied Mathematics, Optimization and Data Science — *2017–2021*
Ranked in the top 5% among 150 students.

PhD Thesis

Title: *Random Matrix and Tensor Models for Large Data Processing*

Supervisors: Romain Couillet, Florent Chatelain.

Jury: Philippe Loubaton, Rémi Bardenet, Mylène Maïda, Walid Hachem, Olivier Michel, Pierre Comon.

Publications

Journals

- H. Lebeau, F. Chatelain, and R. Couillet, *A Random Matrix Approach to Low-Multilinear-Rank Tensor Approximation*, Journal of Machine Learning Research (JMLR), vol. 26, no. 7, pp. 1–64, 2025.

- H. Lebeau, F. Chatelain, and R. Couillet, *Asymptotic Gaussian Fluctuations of Eigenvectors in Spectral Clustering*, IEEE Signal Processing Letters, vol. 31, pp. 1920–1924, 2024.

International Conferences

- H. Lebeau, M. E. A. Seddik, and J. H. de M. Goulart, *Performance Gaps in Multi-view Clustering under the Nested Matrix-Tensor Model*, International Conference on Learning Representations (ICLR), 2024.
- H. Lebeau, R. Couillet, and F. Chatelain, *A Random Matrix Analysis of Data Stream Clustering: Coping With Limited Memory Resources*, International Conference on Machine Learning (ICML), 2022.

National Conferences

- H. Lebeau, *Performance of Rank-One Tensor Approximation on Incomplete Data*, Colloque GRETSI, 2025.
- H. Lebeau, R. Couillet, and F. Chatelain, *HOSVD Tronquée : Analyse d'une Approximation Tensorielle Rapide*, Colloque GRETSI, 2023
- H. Lebeau, R. Couillet, and F. Chatelain, *Une analyse par matrices aléatoires de l'apprentissage en ligne : traiter des grandes données avec des ressources mémoire limitées*, Colloque GRETSI, 2022.

Teaching

Random Matrix Theory and Machine Learning — **ENS Paris-Saclay, Master MVA**
Teaching Assistant, 9h/year — *Since spring 2022*
Introduction to the theory of large random matrices and their applications to machine learning with practical applications.

Statistics — **ENS Lyon, M1**
Teaching Assistant, 24h/year — *Spring 2025*
Advanced statistics topics around parametric estimation, maximum likelihood estimation, testing, regression, concentration of random variables.

Probability and Statistics (STA401) — **Université Grenoble Alpes, L2**
Teaching Assistant, 18h/year — *Spring 2023, 2024*
Basics of probability, standard probability laws, descriptive statistics, estimation, hypothesis testing.

Introduction to Artificial Intelligence (INF103) — **Université Grenoble Alpes, L1**
Teaching Assistant, 18h/year — *Fall 2021, 2022, 2023*
Introduction to basic concepts of machine learning: datasets, classifiers, training, performance evaluation, data processing.

Introduction to Machine Learning — **Grenoble INP, ENSE^3, M2**
Teaching Assistant, 18h/year — *Fall 2022*
Overview of the main tools in machine learning: model assessment, discriminant analysis, PCA, GLM and penalization, clustering with k-means and EM, trees and random forests, deep learning.

Functional Programming — **Université Grenoble Alpes, L1**
Teaching Assistant, 36h/year — *Spring 2022*
Introduction to functional programming with OCAML.

Technical skills

Programming languages

Proficient in: Python (Numpy, Scipy, Scikit-learn, Pytorch, Matplotlib)

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

Software

LaTeX, Git

Languages

French: Mother tongue **English**: Professional **German**: Intermediate

Miscellaneous

- I love road and trail running and the science behind it (physiology, nutrition, training).
- I enjoy cycling and hiking.
- I am interested in physics, philosophy and French literature.