

Dorian Baudry | Postdoctoral Researcher

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Academic Experience

Postdoctoral researcher

Ecole Polytechnique, CREST

Working with Vianney Perchet on bandits, online algorithms and prophet inequalities.

Palaiseau (France)

January 2023–January 2025 (Expected)

Kyoto University

3 months research visit to Shimodaira Lab

○ Collaboration with Prof. Junya Honda on unifying proofs for randomized algorithms in bandits.

Kyoto (Japan)

April 2022–July 2022

PhD in Computer Science, University of Lille

CNRS, ScooL Team (Inria Lille, Cristal)

Non-Parametric Algorithms for Multi-Armed Bandits, supervised by Emilie Kaufmann and Odalric-Ambrym Maillard.

Lille (France)

2019–2022

Teaching Experience

Statistical Learning (9h, graduate level “Master 2 Data Science”)

ENSAE Paris, Teaching Assistant

○ Exercises on VC dimension, generalization bounds, kernels and bandits.

○ Practical sessions in Python (Jupyter): implementation of standard classification algorithms, introduction to Deep Learning (Pytorch)

Palaiseau (France)

2023

Mathematical Tools for the Economist (64h, undergraduate level “Licence 1/2 in Economics”)

University of Lille, Teaching Assistant

○ Introduction to basic mathematical concepts (converging sums, derivatives, ...) during tutorials.

○ The tutorials were designed so that these concepts are used to solve a Macroeconomics problem, from the definition of a model to the analysis of its sensitivity w.r.t. its parameters, pushing students to challenge its assumptions.

Lille (France)

2021–2022

Natural Language Processing (64h, graduate level “Master 2 Web Analysis”)

University of Lille, Teacher

○ I designed a course adapted to students with a computer science background, but limited knowledge in Mathematics. The objective was to provide them with the essential tools to leverage NLP tools for use cases in Web Analysis.

○ Practical sessions in Python (Jupyter): implementation of standard classification algorithms, introduction to Deep Learning (Pytorch).

Lille (France)

2021

Statistical Learning (15h, undergraduate level “Master 1 Applied Mathematics”)

ENSAE Paris, Teaching Assistant

○ Practical sessions in Python: implementation of supervised and unsupervised learning models, mostly using the scikit-learn package.

Lille (France)

2020

Research and Teaching interests

Research Interests: My works on sequential decision-making, particularly Multi-Armed Bandits (MAB), are driven by a focus on both theoretical advancement and real-world applicability. I've specialized in non-parametric stochastic bandits, motivated by a real-world challenge in agriculture. I developed and analyzed novel bandit algorithms tailored to this complex problem, addressing issues such as non-parametric assumptions, risk-aware performance metrics, non-stationary reward distributions, and computational efficiency of optimal algorithms. Recently, I started exploring the topics of safety and fairness in MAB, that are crucial in many applications. During my post-doc, I am considering other types of online problems, including prophet inequalities, with applications to online resource allocation.

I want to extend the methods I developed for addressing intricate sequential decision-making challenges and to further collaborate with experts from diverse fields, facilitating the connection between academic research and real-world applications.

Teaching Interests: My teaching interests revolve around statistics and machine learning. During my academic journey, I gained substantial teaching experience, instructing students from various backgrounds and academic levels. I've had the privilege of teaching both theory and practice. My approach emphasizes simplifying complex concepts with practical examples and analogies. I'm enthusiastic about teaching both introductory and advanced courses, as well as designing courses related to my areas of specialization such as sequential decision-making, bandits, and reinforcement learning.

Publications

- (Preprint, under review at STOC 2024) Ziyad Benomar, Dorian Baudry, and Vianney Perchet. Lookback prophet inequalities. *CoRR*, 2023
- (Preprint, under review at AISTATS 2024) Dorian Baudry, Hugo Richard, Mathieu Molina, Nadav Merlis, and Vianney Perchet. Multi-armed bandits with guaranteed revenue per arm. *CoRR*, 2023
- (Neurips 2023) Dorian Baudry, Fabien Pesquerel, Rémy Degenne, and Odalric-Ambrym Maillard. Fast asymptotically optimal algorithms for non-parametric stochastic bandits. In *Advances in Neural Information Processing Systems*, 2023
- (Preprint, under review at JMLR) Dorian Baudry, Kazuya Suzuki, and Junya Honda. A general recipe for the analysis of randomized multi-armed bandit algorithms. *CoRR*, abs/2303.06058, 2023
- (Preprint, under review at Field Crop Research) Romain Gautron, Dorian Baudry, Myriam Adam, Gatién N. Falconnier, and Marc Corbeels. Towards an efficient and risk aware strategy for guiding farmers in identifying best crop management. *CoRR*, abs/2210.04537, 2022
- (Neurips 2022) Marc Jourdan, Rémy Degenne, Dorian Baudry, Rianne de Heide, and Emilie Kaufmann. Top two algorithms revisited. In *Advances in Neural Information Processing Systems*, 2022
- (AISTATS 2022) Dorian Baudry, Yoan Russac, and Emilie Kaufmann. Efficient algorithms for extreme bandits. In *The 25th International Conference on Artificial Intelligence and Statistics*, 2022
- (Neurips 2021) Dorian Baudry, Patrick Saux, and Odalric-Ambrym Maillard. From optimality to robustness: Dirichlet sampling strategies in stochastic bandits. In *Advances in Neural Information Processing Systems*, 2021
- (ICML 2021) Dorian Baudry, Romain Gautron, Emilie Kaufmann, and Odalric Maillard. Optimal thompson sampling strategies for support-aware cvar bandits. In *Proceedings of the 38th International Conference on Machine Learning*, 2021
- (ICML 2021) Dorian Baudry, Yoan Russac, and Olivier Cappé. On limited-memory subsampling strategies for bandits. In *Proceedings of the 38th International Conference on Machine Learning*, 2021
- (Neurips 2020) Dorian Baudry, Emilie Kaufmann, and Odalric-Ambrym Maillard. Sub-sampling for efficient non-parametric bandit exploration. In *Advances in Neural Information Processing Systems*, 2020

Reviewing experience

- Conferences: Neurips (21, 22, 23), ICML (21, 22), AISTATS (21, 22, 23)
- Best reviewer: AISTATS 22, Neurips 23
- Journal: JMLR, TMLR, JAIR.

Education

ENS Paris-Saclay

MSc Mathématiques, Vision, Apprentissage (MVA).

Courses in Probability Theory, Online Learning, Reinforcement Learning, Computer Vision and Deep Learning.

Paris (France)

2018–2019

ENSAE Paris

MSc in Statistics, applied Mathematics and Economy. Major in Data Science.

Paris (France)

2015–2019

Classe préparatoire MPSI/MP* Prépa Henri Wallon

Intensive courses in mathematics and physics.

Valenciennes (France)

2013–2015

Invited Talks

- Workshop in Resless Bandits, Grenoble, November 2023. *Sub-sampling algorithms for stationary and non-stationary bandits.*
- Seminar at Universitat Pompeu Fabra, Barcelona, November 2022. *Non-parametric Exploration for Multi-Armed Bandits.*
- Seminar at Rikken AIP, Tokyo, July 2022. *Thompson Sampling for CVaR bandits.*
- Contributed talk at StatMathAppli, Fréjus, July 2022. *An application of Bandit algorithms for agriculture.*
- Contributed talk at Rencontre des Jeunes Statisticiens, Porquerolles, March 2022. *Two non-parametric approaches for Multi-Armed Bandits.*

- Seminar at ENS Lyon, March 2022. *Algorithms based on sub-sampling for Bandit exploration.*

Professional Experience

- Kayros** **Paris (France)**
Machine Learning Researcher *May 2019–October 2019*
- Regime Detection in the Energy Market: detect and characterize structural changes in the oil market using financial time series and alternative data (news dataset, tweets, and signals extracted from satellite imagery).
- Societe Generale CIB** **London (UK)**
Junior Index Structurer *January 2018–August 2018*
- Research of new trading strategies and development of back-testing tools in Python
- AXA France** **Paris (France)**
Risk-management Intern *June 2017–November 2017*
- Development of a reserving model for the long term care business in R

Professional skills

Languages

- French : Native
- English : Bilingual

Mathematics

- Statistics and Machine Learning
- Multi-Armed Bandits

Programming

- Python, R

Hobbies

Sport

- Boxing: Muay Thai and MMA.
- Football: playing, and RC Lens fan

Music

- Electric Guitar for 15 years.
- Played in classic-rock bands and progressive metal instrumental jams.

Culture

- French 19th century literature (Balzac, Flaubert, Zola, . . .).
- French cinema