



Guillaume Gautier

Ph.D., 28 years old, French


 Google Scholar
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Research

Keywords Computational statistics, Monte Carlo methods, point processes, simulation algorithms.
Interaction between optimization and simulation, e.g., randomized optimization problems.

Qualif. CNU 26 (mathématiques appliquées), 61 (signal).

Experience

- April 2021 - **Research Software Engineer**, *CNRS – CRISAL – SigMA team*, Lille, France.
now Working for the projects led by [Rémi Bardenet](#):
◦ ERC *Blackjack*: “Fast Monte Carlo integration with repulsive point processes”,
◦ Chaire IA *Baccarat*: “Bayesian learning of expensive models, with applications to cell biology”.
- Aug. 2020 - **Postdoctoral researcher**, *CNRS – GIPSA-lab – GAIA team*, Grenoble, France.
- Mar. 2021 Inverstigation of Partial Rejection Sampling (PRS), see [PartialRejectionSampling.jl](#) .
Collaborators: [Simon Barthelmé](#), [Nicolas Tremblay](#) and [Pierre-Olivier Amblard](#).

Education

- 2017-20 **Ph.D. in Machine Learning**, *CRISAL – SigMA, SequeL – École Centrale de Lille*, France.
Title: *On sampling Determinantal Point Processes (DPPs)*. [T1]
Defense: 19 May 2020. Supervisors: [Rémi Bardenet](#) and [Michal Valko](#).
- 2015-16 **M.Sc. in Applied Mathematics**, *ENS Paris-Saclay*, Cachan, France.
MVA (Mathematics, Computer Vision, Machine Learning): Graphs in ML, MCMC Methods, Random Matrices, Convex Optimization, Probabilistic Graphical Models, Kernel Methods.
- 2014-15 **M.Sc. in Applied Mathematics**, *Université Lille 1*, Lille, France.
Probability & Statistics: Stochastic Processes, Percolation, Itô calculus.
Master thesis: *Phase transition in the configuration graph*. Supervisor: [Chi Tran](#).
- 2012-15 **M.Sc. in Engineering**, *École Centrale de Lille*, Lille, France.
Data Analysis & Decision making : ML, Optimization, Statistical Estimation.
- 2010-12 **Classes préparatoires**, *Lycée du Parc*, Lyon, France.
Intensive preparatory courses in mathematics, physics and chemistry for competitive entrance exams to French Grandes Écoles.





Computer skills

Programming Python, Julia, R, MATLAB.
Documents L^AT_EX, Microsoft Office.
Versioning Git,  GitHub.

Languages

Fluent **French**, mother tongue,
English, main working language.
Basic German, Portuguese, Chinese.







Software

- DPPy **DPP sampling with Python [J1]**, Main developer.
Python module for sampling Determinantal Point Processes (DPPs).
 [GitHub](#)  [Documentation](#)
- "PRS.jl" **PartialRejectionSampling.jl**, Main developer.
Julia module for Partial Rejection Sampling (PRS).
 [GitHub](#)  [Documentation](#)












Publications

See also  [Google Scholar](#) or the list of publications on my  [homepage](#).

Journal papers

- [J2] **G. Gautier**, R. Bardenet, and M. Valko. *Fast sampling from β -ensembles*. Statistics and Computing, 2021.
 [paper](#)  [arXiv:2003.02344](#)  [code](#)
- [J1] **G. Gautier**, G. Polito, R. Bardenet, and M. Valko. *DPPy: DPP Sampling with Python*. Journal of Machine Learning Research - Machine Learning Open Source Software (JMLR-MLOSS), 2019.
 [paper](#)  [arXiv:1809.07258](#)  [code](#)

Conference papers

- [C2] **G. Gautier**, R. Bardenet, and M. Valko. *On two ways to use determinantal point processes for Monte Carlo integration*. Advances in Neural Information Processing Systems (NeurIPS), 2019.
 [paper](#)  [code](#)  [talk](#)  [slides](#)  [poster](#)
- [C1] **G. Gautier**, R. Bardenet, and M. Valko. *Zonotope Hit-and-run for Efficient Sampling from Projection DPPs*. International Conference on Machine Learning (ICML), 2017.
 [paper](#)  [arXiv:1705.10498](#)  [code](#)  [talk](#)  [slides](#)  [poster](#)


Workshop papers

- [W2] **G. Gautier**, R. Bardenet, and M. Valko. *Les processus ponctuels déterminantaux en apprentissage automatique*. French Colloquium on Signal and Image Processing (GRETSI), 2019.
 [paper](#)  [code](#)
- [W1] **G. Gautier**, R. Bardenet, and M. Valko. *On two ways to use determinantal point processes for Monte Carlo integration*. Workshop on Negative Dependence in Machine Learning, International Conference on Machine Learning (ICML), 2019.
 [paper](#)  [code](#)  [talk](#)  [slides](#)  [poster](#)

Thesis

- [T1] **G. Gautier**. *On sampling determinantal point processes*. Ph.D. thesis. École Centrale de Lille, 2020.
 [paper](#)  [code](#)  [talk](#)  [slides](#)

Popularization

- [P1] **G. Gautier**, R. Bardenet, and M. Valko. *Un dé pipé aux multiples facettes pour améliorer les moteurs de recherche*. CNRS info - Résultats Scientifiques - Informatique, 2017.
 [paper](#)

Teaching (121h)

- 2019 **Data Mining - M1 Mathematics and Finance**, *Université de Lille*, [Émilie Kaufmann](#).
15h Practical sessions.
Python with [scikit-learn](#): k-Means, regression (lin, log), decision trees, SVMs, unsupervised learning.
- 2017-18 **Analysis for Engineers - L3**, *École Centrale de Lille*, [Augustin Mouze](#).
50h Tutorial sessions.
 - (40h) Measure, integration and distribution theory.
 - (10h) Refresher on mathematics essentials: matrix calculus, differential equations, convergence of sequences, topology.
- 2017 **Signal Processing - L3**, *École Centrale de Lille*, [Pierre Chainais](#).
56h Tutorial and practical sessions.
Filtering, time-frequency analysis, sampling theory.

Supervision (5 master student projects)

- 2017-19 **Class project, M2 MVA, Graphs in Machine Learning**, *ENS Paris-Saclay*, [Michal Valko](#).
Individual or duo project, accounting for 60% of the course grade.
 - [Nicolas Jouvin](#) and [Victor Pellegrain](#).
Review of *Line Graphs of Weighted Networks for Overlapping Communities* of Evans and Lambiotte, and application to community detection of characters in *Harry Potter* books.
 - [Quentin Chan Wai Nam](#). [GitHub](#)
Review of *Graph sampling with determinantal processes* of Tremblay, Amblard and Barthelmé, and implementation of the key algorithms for graph signal reconstruction.
 - [Juliette Millet](#) and [Sébastien Deschamps](#). [GitHub](#)
Review of *Line Graphs of Weighted Networks for Overlapping Communities* of Evans and Lambiotte, and application to community detection of characters in *One Piece* mangas.
 - [Bérénice Courant](#). [GitHub](#)
Review and implementation of sampling algorithms for uniform and non-uniform spanning trees on graphs.
- 2017 **Research project, M1**, *École Centrale de Lille*.
Individual project accounting for the validation of 2 courses $\approx 64h$.
 - [Robin Quillivic](#), *Discovery of point processes*.
Discovering the key concepts of the theory of point processes (correlation fonctions, simulation strategies, etc.) and application to social sciences.

Responsibilities

Reviewing

- o NeurIPS: 2020.
- o ICML: 2020 (top 33%), 2019, 2018.
- o AISTATS: 2019
- o IJCAI 2017.

Talks

- 2020 - Aug. **GIPSA-lab**, *Working group on graphs point processes*, [Online](#).
Partial Rejection Sampling (a gentle introduction), [PartialRejectionSampling.jl](#) 
- 2020 - Aug. **GIPSA-lab**, *GAIA team presentation*, Grenoble, France.
On adding a list of numbers (and other one-dependent dpps), A. Borodin, P. Diaconis, and J. Fulman.
- 2019 - Jun. **ICML - Workshop Negative Dependence in ML**, *Oral presentation*, Long Beach, CA, USA.
[W1] On two ways to use determinantal point processes for Monte Carlo integration.
- Mar. **Laboratoire Paul Painlevé**, *Working group on Point Processes*, Lille, France.
[J1] Tutorial session on DPPy.  [GitHub](#)
- 2018 - Dec. **CRIStAL**, *SigMA team presentation*, Lille, France.
How to make your research reproducible?
- 2017 - Aug. **ICML**, *Oral presentation*, Sydney, Australia.
[C1] Zonotope Hit-and-run for Efficient Sampling from Projection DPPs.
- Jun. **INRIA**, *Sequel team seminar*, Lille, France.
How to sample DPPs?
- Feb. **CRIStAL**, *SigMA working group*, Lille, France.
Random graphs in *Recueil de modèles aléatoires*, J. Chafaï, F. Malrieu.

Grants and Awards

- 2020 - Jul. **ICML top 33% reviewer award**.
- 2019 - Dec. **NeurIPS** travel grant, Vancouver, Canada.
- 2017 - Aug. **ICML** travel grant, Sydney, Australia.