# Guillaume Gautier

2nd-year Ph.D. student

#### Education

- 2017 now **Ph.D. in Machine Learning**, *CRIStAL SequeL & SigMA teams*, Lille, France. Fast Sampling of Determinantal Point Processes. Supervisors: Michal Valko and Rémi Bardenet.
- 2015 2016 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 2015 M.Sc. in Applied Mathematics, Université Lille 1, Lille, France. Probability & Statistics: Stochastic Processes, Percolation, Itô.

  Master Thesis: Phase transition in the configuration graph, Chi Tran.
- 2012 2015 M.Sc. in Engineering, École Centrale de Lille, Lille, France.

  Data Analysis & Decision making: ML, Optimization, Statistical Estimation.
- 2010 2012 Classes prépatatoires, Lycée du Parc, Lyon, France.

  Intensive preparatory courses in Mathematics & Physics for competitive entrance exams to French Grandes Écoles.

### Internships

- 2016 6 mth Research, CRIStAL SigMA team, Lille, Rémi Bardenet.

  Determinantal Point Processes and matroids.
- 2015 5 mth Research, Lawrence Berkeley National Laboratory, Berkeley, CA, Sylvain Costes.
  - Image processing algorithm for human DNA breaks diagnosis (MATLAB- DIPimage),
  - Image classification algorithm for fuzzy pictures (Python).
- 2014 4 mth Engineering, *R&D Arcelor Mittal Iron Making*, Metz, France.
  - Build and implement a measurement system for an industrial pilot,
  - Data acquisition and analysis using Labview, MATLAB, R.

## Teaching

- 2019 15h **M1 practical sessions**, *Data Mining*, Émilie Kaufmann, Université de Lille. Python and scikit-learn: k-Means, regression (lin, log), decision trees, SVMs, unsupervised learning.
- 2018 36h L3 tutorial sessions, Analysis for Engineers, Augustin Mouze, École Centrale de Lille.
  - o (26h) Measure, integration and distribution theory.
  - o (10h) Refresher on mathematics essentials: matrix calculus, differential equations, convergence of sequences, topology.
- 2017 Fall **M2** class projects, *Graphs in Machine Learning*, Michal Valko, MVA ENS Paris Saclay. I supervised Juliette Millet and Sébastien Deschamps, and Quentin Chan Wai Nam for their respective class project.
  - The goal was to review *Line Graphs of Weighted Networks for Overlapping Communities*, and apply this edge-centric point of view to reveal overlapping communities in the application of their choice: few tomes of One Piece. GitHub page.
  - The goal was to review *Graph sampling with determinantal processes*, and implement the key algorithms to efficiently sample a graph signal for reconstruction purposes. GitHub page.
- 2017 14h **L3 tutorial sessions**, *Analysis for Engineers*, Augustin Mouze, École Centrale de Lille. Measure and integration theory.
  - 56h L3 practical sessions, Signal Processing, Pierre Chainais, École Centrale de Lille.
     Filtering, time-frequency analysis, sampling theory.

2017 – Spring M1 research project, École Centrale de Lille.

I supervised Robin Quillivic, a 1st-year master student on a *Playful discovery of Point Processes*. The aim of this master project is to introduce students to the research environment and tools. At scientific level, the goal was to get him familiar with the main concepts of point processes (correlation functions, simulation strategies, etc.) and then see some applications of his interest in social science.

2016 – Fall **M2 class projects**, *Graphs in Machine Learning*, Michal Valko, MVA – ENS Paris Saclay. I supervised Nicolas Jouvin and Victor Pellegrain for their class project.

The goal was to review Evans and Lambiotte's paper, *Line Graphs of Weighted Networks for Overlapping Communities*, and apply this edge-centric point of view to reveal overlapping communities in the application of their choice: the first Harry Potter book.

#### Computer skills

Programming Python, Julia, R, MATLAB

Documents LATEX, Microsoft Office

Sharing Git, GGitHub

#### Languages

French Mother tongue

English Fluent

German Basic

## Awards/Grants

2017 ICML's travel grant, Sydney, Australia.

#### Miscellaneous

- Basketball (12 years)

- Hiking

- Cycling

- Traveling

#### **Publications**

Gautier, G., Bardenet, R., and Valko, M. Zonotope Hit-and-run for Efficient Sampling from Projection DPPs. In *International Conference on Machine Learning (ICML)*, 2017. arXiv:1705.10498.

Gautier, G., Bardenet, R., and Valko, M. DPPy: Sampling Determinantal Point Processes with Python. *ArXiv e-prints*, 2018. arXiv:1809.07258.