François-Pierre Paty

PhD Student at ENSAE

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Research interests

Recent progress in computational optimal transport have opened the door for a wide range of applications in statistics and machine learning. My research focuses on making those tools more robust—to the curse of dimensionality, to noise, to outliers—in order to provide theoretically consistent and numerically efficient methods in machine learning applications.

Keywords: Optimal Transport, Statistics, Machine Learning.

Education

PhD Student at ENSAE Paris — **Palaiseau, France**

- PhD under the supervision of Prof. Marco Cuturi (ENSAE, Google Brain) — *Since Sept 2018*
- Grant from CREST

Université Paris-Sud — **Orsay, France**

Masters in Statistics and Machine Learning — *2017–2018*

Advanced courses in theoretical statistics and machine learning

ENSAE Paris — **Palaiseau, France**

Engineering Track — *2017–2018*

Specialized in statistics and data science

École polytechnique — **Palaiseau, France**

Engineering Track — *2014–2018*

Studied applied mathematics with focus on applied and theoretical statistics, probability and data analysis

Lycée Louis-le-Grand — **Paris, France**

Classe préparatoire aux Grandes Écoles — *2012–2014*

Intensive two-year university foundation course in mathematics and physics preparing for the nationwide competitive entrance examinations to the Grandes Ecoles

Publications

Regularized Optimal Transport is Ground Cost Adversarial — **Preprint 2020**

F-P. Paty, M. Cuturi

Regularity as Regularization: Smooth and Strongly Convex Brenier Potentials in Optimal Transport — **AISTATS 2020**

F-P. Paty, A. d'Aspremont, M. Cuturi

Subspace Robust Wasserstein Distances — **ICML 2019**

F-P. Paty, M. Cuturi

(20-minute oral, top $\sim 20\%$ of papers)

Talks and Tutorials

- **March 2020:** I taught lab sessions for the *African Master's in Machine Intelligence* in Accra, Ghana
- **January 2020:** I gave a talk at the seminar day *Learning meets Astrophysics* in CEA Saclay
- **November 2019:** I gave a talk at the seminar *Stat·Eco·ML* at ENSAE Paris
- **November 2019:** I gave a talk at *Le Séminaire Palaisien* at INRIA Saclay
- **August 2019:** I gave a tutorial during the *Machine Learning Summer School 2019* in Moscow
- **July 2019:** I gave a talk at *Saint-Flour Probability Summer School* in Saint-Flour, France
- **June 2019:** I gave a 20-minute oral presentation at *ICML 2019* in Long Beach

Research internships

Maximizing Wasserstein distances **Palaiseau, France**
ENSAE Paris *April 2018–July 2018*
Master thesis under the supervision of Prof. Marco Cuturi.

Sparse recovery of time series **Palaiseau, France**
Finance For Energy Market Research Centre and EDF R&D *April 2017–August 2017*
Adapted sparse deconvolution techniques to missing data imputation for time series. Received *congratulations* from the Applied Mathematics department of École polytechnique.

Modelling of raw material markets **Palaiseau, France**
EDF R&D *Sept 2016–March 2017*
Modelling of the long-term ore markets, in collaboration with EDF R&D.

Teaching experience

Teacher Assistant **ENSAE Paris**
Since Sept 2018

- Topology and Analysis *(last-year Bachelor students)*
- Differentiable Optimization *(last-year Bachelor students)*
- Geometric Methods in Machine Learning *(MSc. students)*
- Stochastic Optimization and Automatic Differentiation for Machine Learning *(MSc. students)*
- Optimal Transport : Theory, Computations, Statistics and ML Applications *(MSc. students)*
- Deep Learning: Models and Optimization *(MSc. students)*

Service to the community

Conference Reviewer
AISTATS 2020, ICML 2020

Seminar Organizer
StatEcoML.github.io
I co-organize the "Statistics, Econometrics, Machine Learning" seminar at ENSAE Paris

Programming skills

Advanced: Python (numpy, pandas, sklearn, cupy) **Notions**: PHP, SQL

Languages

French: Mother tongue
English: Fluent
Italian: Fluent
Chinese: High intermediate: HSK4