François-Pierre Paty

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○ francoispierrepaty • French nationality

Research interests

I've been working on algorithmic optimal transport (OT), with applications to machine learning and economics. My work focuses on designing algorithms for OT problems as well as OT tools that are more robust to the curse of dimensionality, to data corruption or noise, so that OT can be efficiently applied to real data problems.

Education

PhD Student at ENSAE Paris   **Palaiseau, France**
○ PhD under the supervision of Prof. Marco Cuturi (ENSAE, Google Brain)   *2018-2021*
○ 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

Professional experiences

Founder of www.hsklevel.com   **HSK level**
AI-based Chinese learning web application   *Since May 2022*

Postdoctoral Researcher   **Palaiseau, France**
Centre de Recherche en Économie et STatistiques (CREST)   *Sept 2021-April 2022*
Developing novel machine learning algorithms with applications in economics

Teaching Assistant   **ENSAE Paris**
Teaching maths and computer science for engineering students   *2018-2021*

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. A patent has been registered by EDF (FR3075969B1)

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

Scientific Publications

- **Algorithms for Weak Optimal Transport with an Application to Economics**, F-P. Paty, P. Choné, F. Kramarz, *preprint*, 2022
- **Regularized Optimal Transport is Ground Cost Adversarial**, F-P. Paty, M. Cuturi, in *International Conference on Machine Learning*, 2020
- **Regularity as Regularization: Smooth and Strongly Convex Brenier Potentials in Optimal Transport**, F-P. Paty, A. d'Aspremont, M. Cuturi, in *International Conference on Artificial Intelligence and Statistics*, 2020, **Notable paper award**
- **Subspace Robust Wasserstein Distances**, F-P. Paty, M. Cuturi, in *International Conference on Machine Learning*, 2019, **Oral presentation**

Awards and Distinctions

- Notable paper award *(top 3 out of 423 accepted papers)*, International Conference on Artificial Intelligence and Statistics, 2020
- Oral presentation *(top 20% of accepted papers)*, International Conference on Machine Learning, 2019
- Congratulations from the Applied Mathematics department of École polytechnique, 2017

Talks, Tutorials and Conference participation

Conferences
- **August 2020:** I gave an online talk at *AISTATS 2020*
- **July 2020:** I gave an online talk at *ICML 2020*
- **June 2019:** I gave a 20-minute oral presentation at *ICML 2019* in Long Beach

Seminars
- **June 2022:** I gave a talk in the New Monge Problems seminar at the Université Gustave Eiffel near Paris
- **May 2022:** I gave a talk at the *Mokaplan team seminar* at INRIA in Paris
- **March 2021:** I gave a talk at the *Image, Optimization and Probability seminar* at the Institut de Mathématiques de Bordeaux
- **March 2021:** I gave a talk at the *EDMH PhD students seminar* in Université Paris Sud
- **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* in ENSAE Paris
- **November 2019:** I gave a talk at *Le Séminaire Palaisien* in INRIA Saclay

Summer Schools
- **August 2019:** I gave a tutorial about computational optimal transport during the *Machine Learning Summer School 2019* in Moscow
- **July 2019:** I gave a talk at *Saint-Flour Probability Summer School*

Conference and Workshop participation (non-speaker)
- **October 2021:** I participated in the Paris workshop on optimal transport with applications to economics and statistics at Sciences Po Paris
- **December 2019:** I presented a poster at *NeurIPS Optimal Transport and Machine Learning Workshop* in Vancouver
- **June 2019:** I participated in the workshop *People in Optimal Transportation and Applications* in Cortona
- **March 2019:** I presented a poster at the workshop *Optimization and Statistical Learning* in Les Houches

Service to the community

Conference Reviewer
AISTATS 2020, ICML 2020, NeurIPS 2020

Seminar Organizer **ENSAE Paris**
StatEcoML.github.io *2019-2020 and 2020-2021*
I co-organize the "Statistics, Econometrics, Machine Learning" (Stat·Eco·ML) seminar at ENSAE Paris

Teaching experience

Teacher Assistant **ENSAE Paris**
Since Sept 2018

- Maths (taught in French):
  - Topology and Analysis *(last-year Bachelor students)*, Fall 2018, Fall 2019, Fall 2020
  - Differentiable Optimization *(last-year Bachelor students)*, Spring 2019, Spring 2020, Spring 2021
  - Mathematical Statistics *(MSc. students)*, Fall 2018, Fall 2020
- Computer Science (taught in English):
  - Geometric Methods in Machine Learning *(MSc. students)*, Spring 2019
  - Stochastic Optimization and Automatic Differentiation for Machine Learning *(MSc. students)*, Spring 2019
  - Optimal Transport : Theory, Computations, Statistics and ML Applications *(MSc. students)*, Spring 2020
  - Deep Learning: Models and Optimization *(MSc. students)*, Spring 2020

Programming skills

Machine Learning: Python (JAX, sklearn) **Web**: ReactJS, PHP, SQL

Languages

French: Mother tongue **Italian**: Fluent
English: Fluent **Chinese**: High intermediate (HSK4)