Alex Delalande

Postdoctoral researcher in Applied Mathematics.

✉ *alex.delalande@epfl.ch*
alex-delalande.github.io

Research interests

Optimal transportation theory and applications, Convex analysis, Convex optimization, Functional inequalities, Machine learning.

Academic positions and education

Jan. 2024–Present **Postdoctoral researcher**, ***EPFL***, Lausanne, Switzerland.
Within the DOLA chair led by Lénaïc Chizat.

2023 **Postdoctoral researcher**, ***Centre Lagrange***, Paris, France.
Within the Optimal Transport group (Guillaume Carlier, Alessio Figalli, Filippo Santambrogio).

2019 – 2022 **Ph.D. in Applied Mathematics**, ***Université Paris-Saclay & INRIA***, France.
Title: Quantitative Stability in Quadratic Optimal Transport.
Supervisors: Quentin Mérigot (Laboratoire de Mathématiques d'Orsay) and Frédéric Chazal (INRIA DataShape team).
Defense: December 14, 2022. *Jury:* Yann Brenier, Frédéric Chazal, Julie Delon (president), Max Fathi (referee), Alessio Figalli, Quentin Mérigot, Dejan Slepčev (referee).

2018–2019 **M.Sc. MVA "Mathematics, Vision and Learning"**, ***ENS Paris-Saclay***, France.
Grade: 17.3/20, Highest honors.

2015–2019 **Diplôme d'ingénieur**, ***École Centrale Paris (now CentraleSupélec)***, France.
Majoring in Applied Mathematics. - Grade: 4.0/4.3.

Publications and preprints

2024 **Sharper Exponential Convergence Rates for Sinkhorn's Algorithm in Continuous Settings**, L. Chizat, A. Delalande, T. Vaškevičius.
Preprint.

2023 **Quantitative Stability of the Pushforward Operation by an Optimal Transport Map**, G. Carlier, A. Delalande, Q. Mérigot.
Foundations of Computational Mathematics (to appear).

2022 **Quantitative Stability of Barycenters in the Wasserstein Space**, G. Carlier, A. Delalande, Q. Mérigot.
Probability Theorey and Related Fields.

2021 **Nearly Tight Convergence Bounds for Semi-discrete Entropic Optimal Transport**, A. Delalande.
AISTATS 2022.

2021 **Quantitative Stability of Optimal Transport Maps under Variations of the Target Measure**, A. Delalande, Q. Mérigot.
Duke Mathematical Journal.

2019 **Quantitative Stability of Optimal Transport Maps and Linearization of the 2-Wasserstein Space**, Q. Mérigot, A. Delalande, F. Chazal. *AISTATS 2020.*

Teaching assistantships

Spring 2024 **EPFL**, *28h*.
- Analysis (Math-106(e))

2020-2022 **Université Paris-Saclay**, $2 \times$ *64h*.
- Statistical inference (MEU354 - L3)
- Numerical Analysis with Python (MDD253/MEU255 - L2)
- Ecology and Statistics (EcoStats - L2)
- Statistical testing in Biology (Math291 - L2)

Spring 2020 **CentraleSupélec**, *10.5h*.
- Optimization (2CC3000 - M1)

Reviewing activities

- COLT (2024)
- AISTATS (2022 [top 10%], 2024)
- SIAM Journal on Imaging Sciences (SIIMS)
- Information and Inference: A Journal of the IMA
- SIAM Journal on Mathematical Analysis (SIMA)

Talks and Poster Presentations

Mar. 2024 ***Journées SMAI MODE 2024***, Lyon, France.

Jan. 2024 ***Journée SMAI SIGMA-MODE 2024***, Paris, France.

Jan. 2024 **CIRM Workshop *PDE & Probability in interaction: functional inequalities, optimal transport and particle systems***, CIRM, Marseille, France.

Nov. 2023 **Oberwolfach Seminar *Variational and Information Flows in Machine Learning and Optimal Transport***, MFO, Oberwolfach, Germany.

Feb. 2023 **Mokaplan team seminar**, Paris, France.

Jan. 2023 **Workshop *Interpolation of measures***, Lagrange Center, Paris, France.

June 2022 **Mokaplan team seminar**, Paris, France.

June 2022 ***Journées SMAI MODE 2022***, Limoges, France.

May 2022 **DataShape team seminar**, Porquerolles, France.

Mar. 2022 ***AISTATS 2022***, Online.

Nov. 2021 **Optimal Transport working group**, Orsay, France.

Nov. 2021 **CIRM Workshop *Schrödinger Problem and Mean-field PDE Systems: Computational and Theoretical Advances***, CIRM, Marseille, France.

June 2021 ***PhD days in Analysis***, Orsay, France.

Aug. 2020 ***AISTATS 2020***, Online.

Dec. 2019 ***NeurIPS 2019 "Optimal Transport and Machine Learning" Workshop***, Vancouver, Canada.

Nov. 2019 **DataShape team seminar**, Porquerolles, France.

Other experience

Feb. 2018 – Jul. 2018 **Research internship - Deep Learning & Computer Vision**, *Institute for Infocomm Research, A*STAR*, Singapore.
Conditional Random Fields and Deep Learning for multi-label classification. Awardee of the Singapore International Pre Graduate Award.
Supervisors: Chuan-Sheng Foo and Vijay Chandrasekhar

Jul. 2017 – Jan. 2018 **Data Science internship - Statistics & Economics**, *Head of Statistics, Banque de France*, France.
Modeling of the French international trade in services.
Supervisor: Martial Ranvier

2017 **Software Engineering mission**, *CNRS*, France.
Translation of 18 of Gabriel Peyré's *Numerical Tours of Data Science* tutorials from Python to R: principles of Wavelet Data Processing, Denoising, Edge Detection and Manifold Learning.

Computer skills

Languages	Python	*TensorFlow, PyTorch, Scikit-Learn, Pandas, Numpy*
	R	*ggplot, tidyr, leaflet, shiny, imager, caret, nnet*
	Matlab, C	
Others	Unix, Git	***GitHub: alex-delalande***

Languages

French	Native
English	Fluent — *TOEFL iBT: 110/120, October 2017*
Spanish	Intermediate

Referees

Quentin Mérigot
Université Paris-Saclay
quentin.merigot@universite-paris-saclay.fr
+33 (0)1 69 15 57 59

Guillaume Carlier
Université Paris Dauphine
carlier@ceremade.dauphine.fr
+33 (0)1 44 05 46 77