

Alex Delalande

Postdoctoral researcher in Applied Mathematics.

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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

- 2023 **Quantitative Stability of the Pushforward Operation by an Optimal Transport Map**, G. Carlier, A. Delalande, Q. Mérigot.
Preprint.
- 2022 **Quantitative Stability of Barycenters in the Wasserstein Space**, G. Carlier, A. Delalande, Q. Mérigot.
Probability Theory 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.
◦ Analyse II (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

- 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 – **Research internship - Deep Learning & Computer Vision**, *Institute for Infocomm Research, A*STAR*, Singapore.
Jul. 2018 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 – **Data Science internship - Statistics & Economics**, *Head of Statistics*,
Jan. 2018 *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	<i>TensorFlow, PyTorch, Scikit-Learn, Pandas, Numpy</i>
	R	<i>ggplot, tidyr, leaflet, shiny, imager, caret, nnet</i>
	Matlab, C	
Others	Unix, Git	GitHub : <i>alex-delalande</i>

Languages

French	Native	
English	Fluent	<i>TOEFL iBT: 110/120, October 2017</i>
Spanish	Intermediate	

Referees

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