VINCENT DIVOL

AI Junior Fellow at PSL

IN SHORT

Birth: 01/02/1995

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ACADEMIC POSITIONS

AI Junior Fellow *Jan. 2023 -*
CEREMADE - Université Paris Dauphine - PSL

Courant Instructor - CDS Faculty Fellow *Sep. 2021 - Dec. 2022*
Courant Institute for Mathematical Science - Center for Data Science, New York University

EDUCATION

Université Paris-Saclay and Inria Saclay *Sep. 2018 - Aug. 2021*
Ph.D. Thesis, *Contributions to geometric inference on manifolds and to the statistical study of persistence diagrams*
under the supervision of Frédéric Chazal et Pascal Massart

Université Paris-Saclay *2017*
Master in probability and statistics, *obtained with highest honors*
Master thesis, *Weak laws of large numbers on persistence diagrams*
under the supervision of Wolfgang Polonik, at UC Davis, California

Sorbonne Université *2015*
Bachelor of mathematics, *obtained with highest honors*

École Normale Supérieure de Paris *2014 - 2018*
Admission after two years of intensive preparation for a nationwide competitive exam

PUBLICATIONS

PREPRINTS

[1] **Minimax estimation of discontinuous optimal transport maps: The semi-discrete case**, joint work with Aram-Alexandre Pooladian and Jonathan Niles-Weed

[2] **Optimal transport map estimation in general function spaces**, joint work with Aram-Alexandre Pooladian and Jonathan Niles-Weed

[3] **A short proof on the rate of convergence of the empirical measure for the Wasserstein distance**

PUBLICATIONS

[4] **Density estimation on manifolds: an optimal transport approach**, *Probability Theory and Related Fields*, 2022

[5] **Minimax adaptive estimation in manifold inference**
Electronic Journal of Statistics, 2021

[6] **Understanding the topology and the geometry of the space of persistence diagrams via optimal partial transport**
collaboration with Théo Lacombe, *Journal of Applied and Computational Topology*, 2020

[7] **On the choice of weight functions for linear representations of persistence diagrams**
collaboration with Wolfgang Polonik, *Journal of Applied and Computational Topology*, 2019

[8] **The density of the expected persistence diagram and its kernel-based estimation**
collaboration with Frédéric Chazal, *Journal of Computational Geometry, Special Issue of Selected Papers from SoCG 2018*

PUBLICATIONS

[9] **Estimation and quantization of expected persistence diagrams**
collaboration with Théo Lacombe, *International Conference on Machine Learning*, 2021

[10] **The density of the expected persistence diagram and its kernel-based estimation**
collaboration with Frédéric Chazal, *Symposium of Computational Geometry 2018* (top $\sim 15\%$ papers from SoCG '18)

TALKS

A star ($\star$) indicates a talk given at an international conference.

[1] **Université Paris Saclay**, 2023, *Minimax estimation of discontinuous optimal transport maps: The semi-discrete case*

[2] **CEREMADE - Université Paris Dauphine**, 2023, *Optimal transport map estimation in general function spaces*

[3] **Université Paris Descartes**, 2023, *Optimal transport map estimation in general function spaces*

[4] **Université Gustave-Eiffel**, 2023, *Optimal transport map estimation in general function spaces*

[5] **Penn State Colloquium - Penn State University**, 2022, *Optimal transport map estimation in general function spaces*

[6] **CRM-ISM Probability seminar - Mc Gill University**, 2022, *Measure estimation on manifolds through optimal transport*

[7] **Research school - Rennes**, 2022, *Statistical optimal transport in high dimension under certain structural assumptions*

[8] **Universität Göttingen**, 2022, *Statistical optimal transport in high dimension under certain structural assumptions*

[9] **CDS seminar - New York University**, 2021, *Quantifying the topology of datasets using Topological Data Analysis*

[10] **Journées MAS**, 2021, *Summarizing the topology of complex datasets with (expected) persistence diagrams*

[11] ($\star$) **ICML**, 2021, *Estimation and quantization of expected persistence diagrams*

[12] **Stochastic Analysis Seminar - Universität Leipzig**, 2021, *Empirical measures and Wasserstein distances - a minimax approach*

[13] **Séminaire Palaisien**, 2021, *Density estimation on manifolds: an optimal transport approach*

[14] **Séminaire Maths Appli - Université de Nantes**, 2020, *Density estimation on manifolds: an optimal transport approach*

[15] **Séminaire Parisien de Statistiques**, 2020, *Density estimation on shapes*

[16] ($\star$) **Young Research Forum, SoCG**, 2020, *Understanding the space of persistence diagrams*

[17] (⋆) **Algebraic Topology: Methods, Computation, and Science**, 2020, *Structure of the space of persistence diagrams*

[18] **Séminaire SPOC - Institut Mathématiques de Bourgogne**, 2020, *Adaptive estimation in manifold inference*

[19] **Rouen Probability Meeting**, 2019, *Adaptive estimation in manifold inference*

[20] **Saint-Flour Probability Summer School**, 2019, *Minimax manifold estimation*

[21] **9th Biennale of the SMAI**, 2019, *Minimax estimation in manifold inference*

[22] **Journées Young Statistician and Probabilists** , 2019, *Introduction to Topological Data Analysis*

[23] (⋆) **SoCG**, 2018, *The density of the expected persistence diagram and its kernel-based estimation*

[24] **Journées Françaises de Statistiques**, 2018, *Introduction to Topological Data Analysis*

[25] **Journées de Géométrie Algorithmique**, 2017, *Laws of large numbers on persistence diagrams*

[26] **Junior Conference on Data Science and Engineering**, 2017, *Laws of large numbers on persistence diagrams*

TEACHING EXPERIENCE

INSTRUCTOR

Discrete Mathematics, undergraduate course, Fall 2021, Fall 2022

Mathematical Tools for Data Science, graduate course, Spring 2022

TEACHING ASSISTANT

Mathematical statistics, 2020, 2021

Business mathematics, 2018, 2019

Organization of a research seminar, for MSc. students majoring in Machine Learning, 2020