VINCENT DIVOL

Courant Instructor & CDS Faculty Fellow

IN SHORT

· Birth: 01/02/1995
· Pronouns: he/him/his
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ACADEMIC POSITIONS

Courant Instructor - CDS Faculty Fellow *2021 - 2023*
Courant Institute for Mathematical Science - Center for Data Science, New York University

EDUCATION

Université Paris-Saclay and Inria Saclay *2018 - 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

· **A short proof on the rate of convergence of the empirical measure for the Wasserstein distance**

PUBLICATIONS

- **Density estimation on manifolds: an optimal transport approach**, to appear in *Probability Theory and Related Fields*, 2022
- **Minimax adaptive estimation in manifold inference**
  Electronic Journal of Statistics, 2021
- **Estimation and quantization of expected persistence diagrams**
  collaboration with Théo Lacombe, *International Conference on Machine Learning*, 2021
- **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
- **On the choice of weight functions for linear representations of persistence diagrams**
  collaboration with Wolfgang Polonik, *Journal of Applied and Computational Topology*, 2019
- **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* (top $\sim 15\%$ papers from SoCG '18)

TALKS

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

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

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

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

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

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

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

Séminaire Parisien de Statistiques, 2020, *Density estimation on shapes*

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

$(\star)$ **Algebraic Topology: Methods, Computation, and Science**, 2020, *Structure of the space of persistence diagrams*

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

Rouen Probability Meeting, 2019, *Adaptive estimation in manifold inference*

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

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

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

($\star$) SoCG, 2018, *The density of the expected persistence diagram and its kernel-based estimation*

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

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

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

TEACHING EXPERIENCE

Instructor

- **Discrete Mathematics**, undergraduate course, Fall 2021
- **Mathematical Tools for Data Science**, graduate course, Spring 2022

Teaching assistant

- **Statistics**, 2020, 2021
- **Business mathematics**, 2018, 2019

I also have organized a research seminar for MSc. students majoring in Machine Learning in Fall 2020.

SERVICE TO THE PROFESSION

I coorganize in Spring 2022 the Math and Data (*MaD*) seminar at the Center for Data Science, New York University.

I have reviewed articles for the following journals and conferences:

- **Electronic Journal of Statistics**
- **Discrete and Computational Geometry**
- **Journal of Applied and Computational Geometry**
- **Foundations of Computational Mathematics**
- **Symposium of Computational Geometry (SoCG)**
- **NeurIPS**

- **ICLR**
- **AISTATS**