Olympio Hacquard

Resume

Education

2016-2020 **Normalien élève from ENS Paris-Saclay**, *Cachan*.

2016-2018 **Bachelor in mathematics**, *ENS Paris-Saclay*, Cachan, *First class honors*.

2018-2019 **Master of mathematics, Computer Vision and Machine Learning**, *ENS Paris-Saclay*, Cachan, *honors*.

2020-2023 **PhD in mathematics**, *Université Paris-Saclay, INRIA*, From Topological Features to Machine Learning Models: A Journey through Persistence Diagrams, Under the supervision of Gilles Blanchard and Clément Levrard.

Research experiences

2024-2025 **JSPS Postdoctoral research fellow**, *Hiraoka group*, Kyoto University Institute for Advanced Study, Japan.

2025- **Program specific researcher**, *Hiraoka group*, Advanced Study of Human Biology institute, Kyoto University, Japan.

Pre-doctoral research experiences

2017 **5 months research internship**, *Under the supervision of Jean-Michel Morel and Jérémy Anger*, CMLA, ENS-Paris Saclay.
Phase retrieval methods for blur kernel estimation.

2018 **4 months research internship**, *Under the supervision of Fanny Delebecque and Patrick Cattiaux*, IMT, Université Toulouse 3 Paul Sabatier.
Topological interactions for collective behaviour.

2019 **5 months research internship**, *Under the supervision of Stéphanie Allassonnière*, VitadX and CRC, Université Paris Descartes.
Data synthesis using atlas estimation and differential geometry

2019-2020 **Pre-doctoral research year abroad**, *Under the supervision of Herbert Edelsbrunner and Wolfgang Polonik*, IST Austria and UC Davis, Vienna and Davis.
On some stochastic aspects of topological data analysis

Teaching experiences

2018 **Math examiner**, *Lycée Henri IV and lycée St-Louis*.

2020-2023 **Teaching assistant**, *Université Paris-Saclay*, Maths for economics, Python lab session, Statistical testing, Markov chains, Practice orals.
Bachelor and Master level

Publications

2022 **Topologically penalized regression on manifolds**, *O. Hacquard, K. Balasubramanian, G. Blanchard, C. Levrard, W. Polonik*, JMLR.

2024 **Some flocking properties for a model of collective dynamics with topological interactions.**, *P. Cattiaux, F. Delebecque, O. Hacquard*, Communications in Mathematical Sciences.

2024 **Euler characteristic tools for topological data analysis**, *O. Hacquard, V. Lebovici*, JMLR.

2024 **Discrete transforms of quantized persistence diagrams**, *M.E. Van Huffel, O. Hacquard, V. Lebovici, Matteo Palo*, ALENEX 25.

2025 **Hypergraph clustering using Ricci curvature: an edge transport perspective**, *O. Hacquard*, TMLR.

2026 **Statistical learning on measures, an application to persistence diagrams**, *O. Hacquard, G. Blanchard, C. Levrard*, EJS.

Communications

April 2021 **Diffeomorphic atlas estimation for bladder cancer prediction**, *UC Davis working group*, Remote.

June 2021 **Regression on a Laplace eigenbasis using a topological penalty**, *JDS 2021*, Remote.

October 2021 **Regression on a Laplace eigenbasis using a topological penalty**, *Congrès des jeunes chercheurs en mathématiques appliquées*, Ecole Polytechnique.

December 2021 **Topologically penalized regression on manifolds**, *Forum des jeunes mathématicien.ne.s*, Université de Franche-Comté.

January 2022 **Topologically penalized regression on manifolds**, *IRMAR statistics seminar*, Université Rennes II.

April 2022 **Topologically penalized regression on manifolds**, *Young statisticians meeting*, Porquerolles.

August 2022 **Statistical learning on measures (poster)**, *Stat Maths appli workshop*, Frejus.

April 2023 **Statistical learning on measures (poster)**, *Statlearn workshop*, Montpellier.

May 2023 **Topologically penalized regression on manifolds (poster)**, *ICLR 2023*, Kigali, *Journal to conference track*.

June 2023 **Euler tools in topological data analysis**, *APTIKAL team seminar*, Laboratoire d'informatique de Grenoble.

July 2023 **Classification of measures, an application to persistence diagrams**, *JDS 2023*, Université Libre de Bruxelles.

January 2024 **Euler tools in topological data analysis**, *Séminaire de mathématiques appliquées*, Laboratoire de mathématiques Jean Leray, Nantes.

June 2024 **Topologically penalized regression on manifolds**, *Bi-med team seminar*, Kyoto university, Japan.

August 2024 **Topologically penalized regression on manifolds**, *Workshop on data science and related mathematics*, Ikueikan university, Wakkanai, Japan.

December 2024 **Statistical learning on measures, an application to persistence diagrams**, *Congress of applied mathematics of the Japanese mathematical society*, Ritsumeikan university, Shiga, Japan.

February 2025 **Persistence diagrams, use and limitations**, *Séminaire parisien de statistiques*, Institut Henri Poincaré, Paris.

February 2025 **Hypergraph clustering using Ricci curvature: an edge transport perspective**, *Datashape team seminar*, Laboratoire de mathématiques d'Orsay.

April 2025 **Hypergraph clustering using Ricci curvature: an edge transport perspective**, *Kelin Xia group team seminar*, Nanyang Technological University, Singapore.

April 2025 **Euler characteristic tools for persistence diagrams (poster)**, *ICLR 2025*, Singapore, *Journal to conference track*.

November 2025 **Hypergraph clustering using Ricci curvature: an edge transport perspective**, *Mathematical science team seminar*, Riken, Yokohama, Japan.

December 2025 **Persistence diagrams, use and limitations**, *CFE-CMStats*, Birkbeck, University of London.

Distinctions

September 2021 **Mathematics and industry challenge**, *with E. Lasalle and V. Lebovici*, Pedestrians trajectory reconstruction, Eurecam company.
1st place

Visits

April-July 2022 **UC Davis**, *Department of statistics*, W. Polonik and K. Balasubramanian.

November 2024 **Kyushu university, Fukuoka**, *Institute of mathematics for industry*, Yuichi Ike.

Outreach activities

2018 **Cordées de la réussite**, *Scientifical outreach for high-school students*, Nim game.

2020-2022 **Maths en Jeans**, *Research initiation weekly workshop for middle-school students*.

Languages

French Native language

English Level C1+ *Cambridge Advanced 199/210*

Russian Level B1

Japanese Notions