



# 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-ongoing **Postdoctoral research fellow, Hiraoka group, ASHBi, 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 Allasonnière, 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.
- 2023 **Statistical learning on measures, an application to persistence diagrams**, *O. Hacquard, G. Blanchard, C. Levrard*, Preprint.
- 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.

## 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**, *APTICAL 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.

---

## 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.

---

## 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