

# Timothée Mathieu – CV

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Ph.D. Student @ Paris-Saclay University

## Contact

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## Research Interests

Robust estimation, M-estimation, high-dimensional statistics, concentration of measure, supervised learning, empirical processes.

## Education

- 2018–2020** Ph.D. at Paris-Saclay University.  
Subject: M-estimators and Median-of-Means Applied to Statistical Learning.  
Supervisors: Matthieu Lerasle and Guillaume Lécué.  
Ph.D. jury members: Gilles Blanchard (President), Christophe Biernacki (Reviewer), David Donoho (Reviewer), Olivier Catoni (Jury), Po-Ling Loh (Jury) and Elvezio Ronchetti (Jury).  
Defended on 13<sup>rd</sup> of January 2021.
- 2016–2017** M.Sc. (2<sup>nd</sup> year) at ENS Cachan; specialization in Mathematics for Vision and Learning (master MVA).
- 2015–2016** M.Sc. (1<sup>st</sup> year), at ENS Cachan (Department of Mathematics).
- 2014–2015** B.Sc. (3<sup>rd</sup> year), at ENS Cachan (Department of Mathematics).
- 2012–2014** Preparatory School to Grandes Ecoles (specifically B.Sc. 1<sup>st</sup> and 2<sup>nd</sup> year).

## Membership

- 2018–2021** Member of the CELESTE team (INRIA).

## Teaching Experience

- 2018–2021** Teaching Assistant for three course on Statistics,
- ENSTA: Applied Mathematics,  $\sim 30$  1<sup>st</sup>-year M.Sc. students.
  - Paris-Saclay University: Mathematics in INTERaction (MINT),  $\sim 30$  3<sup>rd</sup>-year B.Sc. students.
  - Paris-Saclay University: Stat-AI,  $\sim 30$  1<sup>st</sup>-year M.Sc. students.
  - Paris-Saclay University: Statistical Methods for prediction,  $\sim 10$  3<sup>rd</sup>-year B.Sc. students.
  - Paris-Saclay University: Statistical inference,  $\sim 35$  3<sup>rd</sup>-year B.Sc. students.

## Invited Talks

- 2021** M-estimation and Median of Means for Robust Machine Learning (presentation, 45 minutes)  
Seminaire Palaisien (Paris-Saclay)
- 2021** M-estimation and Median of Means for Robust Machine Learning (presentation, 60 minutes)  
Geneva School of Economics and Management (GSEM, University of Geneva)
- 2020** Concentration Inequalities on M-estimators for Robust Mean Estimation (presentation, 30 minutes)  
Winter School on Mathematical Statistics, University of Luxembourg

- 2019** Robust Machine Learning (presentation, 20 minutes)  
StatMathAppli Statistics Summer School at Fréjus
- 2018** Robust Machine Learning (presentation, 50 minutes)  
Machine Learning and Massive Data Analysis (MLMDA) research group, ENS Cachan.

## Reviewing for Journals

- 2019–** Journal of the American Statistical Association (JASA).

## Reviewing for Conferences

- 2021** Neural Information Processing Systems (NIPS-2021).
- 2021** International Conference on Machine Learning (ICML-2021).
- 2020** International Conference on Learning Representations (ICLR-2021).

## Professional Experience

- 2017-2018** Internship at University of Geneva  
Subject: Robust Statistics and Their Applications to the Median-of-Means  
Supervisor: Elvezio Ronchetti  
Duration: 9 months
- 2017-2018** Internship at University of Orsay  
Subject: Median-of-Means Risk Minimization, a Robust Version of Empirical Risk Minimization Methods  
Supervisor: Matthieu Lerasle  
Duration: 4 months
- 2015-2016** Internship at University of Toulouse, at the Mathematical Institute of Toulouse (IMT)  
Subject: Study of a Clustering Criterion  
Supervisors: Sébastien Gerchinovitz and Aurélien Garivier  
Duration: 4 months
- 2015-2016** Internship at ENS Cachan, Center of Mathematics and Their Applications (CMLA)  
Subject: Analysis of Time-Frequency Physiological Signals  
Supervisor: Thomas Moreau  
Duration: 4 months

## Attendance of Conferences and Summer Schools

- 2020** Winter School on Mathematical Statistics, University of Luxembourg
- 2020** Meeting in Mathematical Statistics, CIRM
- 2020** International Conference on Machine Learning (ICML)
- 2019** Saint-Flour Statistics and Probability Summer School
- 2019** StatMathAppli statistics summer school at Fréjus

## Software

- Python**
- Robust module in the scikit-learn-extra library,  
(<https://github.com/scikit-learn-contrib/scikit-learn-extra>),
  - Outlier-robust mean embedding and maximum mean discrepancy estimators,  
(<https://bitbucket.org/TimotheeMathieu/monk-mmd>)

- Robust Regression and Classification,  
(<https://github.com/TimotheeMathieu/Excess-risk-bounds-in-robust-empirical-risk-minimization>)
- Robust Classification with Median of Means  
([https://github.com/TimotheeMathieu/MOM\\_Classification](https://github.com/TimotheeMathieu/MOM_Classification))

**Skills** Python, R, Matlab, Maple, L<sup>A</sup>T<sub>E</sub>X, Linux

## Journal Articles & Conference Papers

- [1] Stanislav Minsker and Timothée Mathieu. Excess risk bounds in robust empirical risk minimization. *Information and Inference: A Journal of the IMA* (to appear; preprint available at <https://arxiv.org/abs/1910.07485>), 2020.
- [2] Matthieu Lerasle, Timothée Mathieu, and Guillaume Lecué. Robust classification via MOM minimization. *Machine Learning*, 109(8):1635–1665, 2020.
- [3] Matthieu Lerasle, Zoltán Szabó, Timothée Mathieu, and Guillaume Lecué. MONK – outlier-robust mean embedding estimation by median-of-means. In *International Conference on Machine Learning (ICML)*, pages 3782–3793, 2019.

## Preprints

- [1] Timothée Mathieu. Concentration study of m-estimators using the influence function. <https://arxiv.org/abs/2104.04416>, 2021.