Mathieu Carrière

Topological Data Analysis and Machine Learning

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French and American citizenship

Education

Now: Research Scientist, *DataShape, Inria Sophia Antipolis, Biot, France.*

2018-2020: Postdoc. Research Fellow, *Rabadán Lab, Columbia University, New York, USA.*

2014-2018: Ph.D. in Computer Science, *EDSTIC (Saclay), Inria Saclay, Palaiseau, France.*
Title: On metric and statistical properties of topological descriptors for geometric data.

2011-2014: Engineering Degree, *Ecole Centrale Paris, Châtenay-Malabry, France.*

2013-2014: M.Sc. in Mathematics, Vision and Learning, *ENS Cachan, Cachan, France.*

Research impact

I work on applied Topological Data Analysis (TDA) and statistical Machine Learning (ML).

ML Publications in NeurIPS, AISTATS, ICML, JMLR, IJCAI.

TDA Publications in SoCG, FoCM, Abel.

Applis Publications in SGP, Bioinformatics, BMC Bioinformatics.

Details on the articles can be found on my website: `https://mathieucarriere.github.io/website`.

Skills

Languages French (native), English (professional TOEFL 627/677), Spanish (B1 level).

Code C++, Python (proficient), R, Matlab (prior experience).

Coding projects

- Cover complex module of the C++/Python GUDHI library: `http://gudhi.gforge.inria.fr/doc/latest/group__cover__complex.html`.
- Representations module of the C++/Python GUDHI library: `https://gudhi.inria.fr/python/3.1.0.rc1/representations.html`.
- PersLay: a neural network layer for optimizing vectorizations of persistence diagrams: `https://github.com/MathieuCarriere/perslay`.
- MREC: a fast computational tool for optimal transport and applications to genomics: `https://github.com/MathieuCarriere/mrec`.
- My other projects can be found on my GitHub account: `https://github.com/MathieuCarriere`.

Grants

- Mobility Grant (1000 euros) from the DAAD exchange program.
- Mobility Grant (1000 euros) from the STIC doctoral school.
- Best Scientific Contribution 2017 (2nd Prize – 600 euros) from the STIC doctoral school.
- Funding Support (1800 dollars) from ICML 2017.
- Thiessé de Rosemont / Schneider Prize (10,000 euros) from Chancellerie des Universités de Paris.

Teaching Activities

I am an instructor for the following courses.

2021–2022 *Geometric and Topological Methods in Machine Learning,* Université Côte d'Azur, Nice, France.

2020–2022 *Foundations of Geometric Methods in Data Analysis,* CentraleSupélec, Gif-sur-Yvette, France.

I was a teaching assistant for the following courses.

2015–2017 *Topological Data Analysis,* Ecole Polytechnique, Palaiseau, France.

2016–2017 *Basics of Algorithmic and Progamming,* Ecole Polytechnique, Palaiseau, France.

Outreach Activities

I organized the following events.

2019–2020 *New-York Applied Topology Meeting Group,* Columbia University, New-York, USA, `https://psoc.c2b2.columbia.edu/index.php/new-york-applied-topology-meeting-group/`.

Nov. 2019 *Symposium on Random Matrix Theory,* Columbia University, New-York, USA, `http://mc4660-projects.s3-website-us-east-1.amazonaws.com/rmtsymp2019/index.html`.

References

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