



# Guillaume Metzler

Postdoctoral Researcher

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01/07/1992 - Haguenau

28 years old

Driving License

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## Experiences

- October 2019 - **Postdoctoral Researcher - Hubert Curien Laboratory University of Saint-Etienne.**  
March 2020  
*Position funded by the ANR project LIVES and under the supervision of Amaury Habrard.  
Topics of research: Metric Learning for Imbalanced data (with a PhD Student) and Domain Adaptation using PAC Bayes Theory*
- January 2016 - **PhD Student - Hubert Curien Laboratory University of Saint-Etienne.**  
September 2019  
*Learning from Imbalanced Data: an Application to Bank Fraud Detection  
Topics of research: Statistical Theory - Optimization - Supervised Learning - Imbalanced Classification - Metric Learning - Algorithm Stability - Boosting*
- January 2016 - **R&D Engineer - Data Scientist, Blitz Business Service Company, Villefontaine.**  
January 2019  
*Company working on check Fraud detection. Main tasks :*
  - Implement their current system using a free software.
  - Working on graphs using loyalty cards to improve the fraud detection algorithm.
  - Improve retailers benefits using cost-sensitive methods.
- 2015 **R&D Engineer, Blitz Business Service Company, Villefontaine.**  
October - December  
*Fixed-term employee before starting my PhD.*
- 2015 **Internship at INRIA Villeurbanne (Team Dracula), Supervisors: Fabien Crauste et Olivier Gandrillon.**  
March-September  
*Study the variability of Immune Response in a population of mice using Mixed Effect Model. Building a model of Ordinary Differential Equations and use the Data to fit the parameters of the model using an SAEM algorithm using the software Monolix (6 months)*
- 2014 **Internship at ICPEES (CNRS Strasbourg), Supervisor : Guy Schlatter.**  
June - July  
*Modeling using finite element of the Electrospinning process (6 weeks).*

## Education

- January 2016- **PhD Student: Machine Learning, University of Jean-Monnet - Saint-Etienne, ,**  
September 2019  
**PhD on the topic of Fraud and Anomaly Detection, Defended the 25<sup>th</sup> September 2019. Jury Members:**
  - Marianne Clausel (Reviewer)
  - Marc Tommasi (Reviewer)
  - Yves Grandvalet (President)
  - Elisa Fromont (Co-supervisor)
  - Amaury Habrard (Co-supervisor)
  - Marc Sebban (Director).
- 2012 – 2015 **Magistere: Mathematics, University of Strasbourg, Fundamental and Applied Mathematics with honors, rank: 4/12 during the first year, rank: 5/12 during the second year.**
- 2014 – 2015 **Master 2: Applied Mathematics, University of Claude Bernard Lyon 1, Mathematics applied to Biology and Medicine with distinction.**
- 2013 – 2014 **Master 1: Fundamental Mathematics, University of Strasbourg, Fundamental and Applied Mathematics with distinction, rank: 8/28.**
- 2012 – 2013 **Bachelor: Fundamental Mathematics, University of Strasbourg, Fundamental and Applied Mathematics with honors, rank: 7/65.**

- 2010 – 2012 **"Classe Préparatoire aux Grandes Ecoles (CPGE)"**, *MPSI-MP*, Lycée Kléber, Strasbourg.
- 2010 **Baccalauréat Scientifique**, *Alphonse Heinrich High School - Haguenau*, Option Mathematics, With Honors.

## Teaching Assistance

- 2019-2020 **Bachelor 1: Numerical tools**, *Introduction to L<sup>A</sup>T<sub>E</sub>X and the use of the Terminal with Linux*, (36 hours).  
University of Jean Monnet (In French)
- Bachelor 1: Data Bases**, *Introduction to the use of data bases and SQL Server*, (48 hours).  
(In French)
- Bachelor 1: Introduction to Python**, *Introduction to Python*, (60 hours).  
(In French)
- 2019-2020 **Bachelor 1: Data Analysis**, *Read, manipulate, show the results of a survey and teach how to analyze them to extract information. Use of Sphinx Campus software*, (36 hours).  
EM Lyon (In French)
- 2018-2019 **Master 1: Optimization & Operational Research**, *Convex Sets and Functions, Linear Algebra, Gradient Descent Algorithm and its variants, Application to Logistic Regression, Condition Number, Practical Session using R*, (14 hours).  
University of Jean Monnet (In English)
- 2017-2018 **Master 1: Optimization & Operational Research**, *Convex Sets and Functions, Linear Algebra, Gradient Descent Algorithm and its variants, Application to Logistic Regression, Condition Number, Practical Session using R*, (18 hours).  
University of Jean Monnet
- Master 1: Introduction in Machine Learning**, *Generalization, Cross-Validation, k-NN Algorithm, Bayesian Approaches*, (6 hours).  
(In English)
- 2016-2017 **Master 1: Optimization & Operational Research**, *Convex Sets and Functions, Linear Algebra, Gradient Descent Algorithm and its variants, Practical Session using R*, (10 hours).  
University of Jean Monnet (In English)

## Publications

### Journals



**Learning maximum excluding ellipsoids from imbalanced data with theoretical guarantees**, G. Metzler, X. Badiche, B. Belkasmi, E. Fromont, A. Habrard and M. Sebban, *Pattern Recognition Letter*, 2018.

### International Conferences



**An Adjusted Nearest-Neighbor Algorithm Maximizing the F-Measure from Imbalanced Data**, R. Viola, R. Emonet, A. Habrard, G. Metzler, S. Riou and M. Sebban, In *Proceedings in the 31st International Conference on Tools with Artificial Intelligence (ICTAI)*, Portland, Oregon, USA, November 2019.



**From Cost-Sensitive Classification to Tight F-Measure Bounds**, K. Bascol, R. Emonet, A. Habrard, G. Metzler and M. Sebban, In *Proceedings in the 22nd International Conference on Artificial Intelligence and Statistics (AISTATS)*, Naha, Okinawa, Japan, April 2019.

**Tree-based Cost Sensitive Methods for Fraud Detection in Imbalanced Data**, G. Metzler, X. Badiche, B. Belkasm, E. Fromont, A. Habrard and M. Sebban, In Proceeding in International Symposium on Intelligent Data Analysis (IDA), 's-Hertogenbosch, Netherlands, October 2018.

## National Conferences



**CONE : Une version ajustée de l'algorithme des plus proches voisins maximisant la F-mesure**, R. Viola, R. Emonet, A. Habrard, G. Metzler, S. Riou and M. Sebban, Conférence sur l'Apprentissage Automatique (CAp), Toulouse, France, 2019.



**CONE : Un algorithme d'optimisation de la F-Mesure par pondération des erreurs de classification**, K. Bascol, R. Emonet, E. Fromont, A. Habrard, G. Metzler and M. Sebban, Conférence sur l'Apprentissage Automatique (CAp), Rouen, France, 2018.



**Apprentissage de sphères maximales d'exclusion avec garanties théoriques**, G. Metzler, X. Badiche, B. Belkasm, S. Canu, E. Fromont, A. Habrard and M. Sebban, Conférence sur l'Apprentissage Automatique (CAp), Grenoble, France, 2017.

## Reviews

Reviewer Machine Learning journal (ECML 2018)  
Co-Reviewer AISTATS 2020 (with Amaury Habrard)- Machine Learning journal (ECML 2017, with Elisa Fromont)

## Other activities

Help in the organization of the MISNC conference in 2018 in Saint-Etienne.

## Computer Skills

R, Scilab, Maple, Monolix, Feel ++, L<sup>A</sup>T<sub>E</sub>X, Python (currently learning)

## Languages

English	University level	10 years of study – TOEIC : 710 / 990
German	CPGE level	9 years of study

## Other Activites

Sport Running, Cycling, Fitness  
Jobs 2010 – Working as Logistician during the summer (SCHAEFLER France) 4x8, 2x8  
2014  
Teaching Mathematics and Physics for students in high school and 1B.