Guillaume **Metzler**

PhD Candidate

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Experiences

January 2016 - September 2019
PhD Student - Laboratoire Hubert Curien University of Saint-Etienne.
Learning from Imbalanced Data: an Application to Bank Fraud Detection
• *Topics of research: Statistical Theory - Optimization - Supervised Learning - Imbalanced Classification - Metric Learning*

January 2016 - January 2019
R&D Engineer - Data Scientist, Blitz Business Service Company, Villefontaine.
Company working on check Fraud detection, their main costumers are the supermarket distribution. Main tasks :
• *Implement the current system using a free software (**R**),*
• *Working with graphs and loyalty cards to improve the fraud detection,*
• *Include the notion of profits of a supermarket in the fraud detection model.*
• *Working with Linear Discriminant Analysis and Random Forest to improve the current model with sampling methods,*
• *Working with: SVM, Logistic Regression, Decision Trees, Random Forests, ...*
• *Development of a new model using a Metric Learning approach .*

2015 October - December
R&D Engineer, Blitz Business Service Company, Villefontaine.
Fixed-term employee before starting my PhD. Knowledge around the notion of Fraud and Anomaly detection. Working on False checks and implement some strategies using Boosting Methods combine with SVM and basics optimization algorithms, muldi-dimensional scaling.

2015 March- September
Internship at INRIA Villeurbanne (Team Dracula), Supervisors: Fabien Crauste et Olivier Gandrillon.
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 (Implemented in Monolix). (6 months)

2014 June - July
Internship at ICPEES (CNRS Strasbourg), Supervisor : Guy Schlatter.
Modeling using finite element of the Eletrospinning process (6 weeks).

Education

January 2016- September 2019
PhD Student: Machine Learning, *University of Jean-Monnet - Saint-Etienne,* , PhD on the topic of Fraud and Anomaly Detection.

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.

2018-2019 University of Jean Monnet	**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).*
2017-2018 University of Jean Monnet	**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).*
	Master 1: Introduction in Machine Learning, *Generalization, Cross-Validation, k-NN algorithm, Bayesian Approaches*, (6 hours).
2016-2017 University of Jean Monnet	**Master 1: Optimization & Operational Research**, *Convex Sets and Functions, Linear Algebra, Gradient Descent Algorithm and its variants, Practical Session using **R**, (10 hours).*

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

Tree-based Cost Sensitive Methods for Fraud Detection in Imbalanced Data, *K.Bascol, R.Emonet, E. Fromont, 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, *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 .

Tree-based Cost Sensitive Methods for Fraud Detection in Imbalanced Data, *G. Metzler, X.Badiche, B.Belkasmi, 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 : Un algorithme d'optimisation de la F-Mesure par pondération des erreurs de classification, *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.Belkasmi, S. Canu, E. Fromont, A. Habrard and M. Sebban*, Conférence sur l'Apprentissage Automatique (CAp), Grenoble, France, 2017.

Computer Skills

R, Scilab, Maple, Monolix, Feel ++, LaTeX

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 – 2014	Working as Logistician during the summer (SCHAEFLLER France) 4x8, 2x8
Teaching	Mathematics and Physics for students in high school and 1B.