

Bastien Dussap

PhD student in mathematics

* 17 June 1998

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Education

- 2021–2024 **PhD thesis in Machine Learning**, *Université Paris Saclay*
PhD thesis in Machine Learning apply to the comparison of Cytometric data.
- 2019–2021 **Master Mathématiques et Applications**, *Université Paris Saclay*
Master's degree in Mathematics apply to Artificial Intelligence.
- 2016–2019 **Licence de Mathématiques**, *Université Paris Saclay*
Bachelor's degree of Mathematics. The first two years at Evry and the last one at Orsay.

PhD thesis

Title *Cytometric data comparison*

Supervisors Gilles Blanchard and Marc Glisse

Abstract PhD thesis in partnership with Metafora biosystem a bio-engineering company. The company has created a software, Metaflow, that allows automatic analysis of flow cytometry data. My work focuses on the use of machine learning models to transfer the analysis performed on one sample to a new unanalysed one. We rely on Reproducing Kernel Hilbert space to embed and store high-dimensional features in Euclidian Space. We use these representations to, firstly, estimate the proportions of each population in a new sample, and secondly to automatically name the cluster obtained by metaflow.

Experience

Teaching

- 2022–2023 **Mathematics for Management**, *IUT Sceaux*, L1 B.U.T GEA
Taught by Patrick Pamphile.

Seminar

- 2022–2024 **Seminar**, *Université Paris-Saclay*, Master 2
Co-organizer of the seminar for master students in Statistics and Machine Learning at Université Paris-Saclay.

Publication

2023 **Label Shift Quantification with Robust Guarantees via Distribution Feature Matching** , *ECML/PKDD 2023*, With Gilles Blanchard and Badr-Eddine Chérif-Abdellatif

Quantification learning deals with the task of estimating the target label distribution under label shift. There exist two main classes of quantifiers in the literature: classification-based methods vs statistical mixture modeling approaches. In this paper, we propose an efficient and scalable quantifier that belongs to the second class, and we present a unifying framework based on feature distribution matching that recovers estimators from both quantification families. In particular, we derive a general consistency theorem under label shift which improves upon the bounds that can be found in the literature, investigate the misspecified setting where the exact label shift hypothesis is challenged, and provide a detailed numerical study on simulated and real-world datasets.

Languages

French	Native	
English	B2	CEFR rating

Computer skills

■ ■ ■ ■ ■	basic knowledge	■ ■ ■ ■ ■	extensive project experience
■ ■ ■ ■ ■	intermediate knowledge with some project experience	■ ■ ■ ■ ■	deepened expert knowledge
		■ ■ ■ ■ ■	expert / specialist

	Level	Skill	Years	Comment
Language:	■ ■ ■ ■ ■	Python	4	<i>Used Python and standard Machine Learning packages such as numpy, matplotlib, scikit-learn or pytorch. Creation of custom package.</i>
	■ ■ ■ ■ ■	SQL		<i>Online course on SQLite</i>
	■ ■ ■ ■ ■	R	1	<i>Used R for Machine Learning project during my education.</i>
	■ ■ ■ ■ ■	Zotero	3	<i>Used Zotero during the PhD to manage my bibliography.</i>
	■ ■ ■ ■ ■	L ^A T _E X	5	
OS:	■ ■ ■ ■ ■	Linux	4	<i>I only use Ubuntu for work.</i>
	■ ■ ■ ■ ■	Windows	10+	<i>Use Windows at home.</i>