
Thibault LESIEUR

EDUCATION **PHD IN STATISTICAL PHYSICS AND MACHINE LEARNING IN IPHT (CEA SACLAY FRANCE) UNDER THE SUPERVISION OF LENKA ZDEBOROVÁ**

AMX PhD grant from Fondation de l'école Polytechnique from 09/01/2014 to 10/09/2017

MASTER ICFP IN QUANTUM PHYSICS AT ÉCOLE NORMALE SUPÉRIEURE IN PARIS FRANCE

Final rank 6/40: 09/01/2013–06/30/2014

ÉCOLE POLYTECHNIQUE

Graduated from Ecole Polytechnique, France.

Final rank 140/500: 09/01/2010–09/01/2014

PUBLICATIONS ***Statistical and computational phase transitions in spiked tensor estimation:***

Submitted to Information Theory (ISIT), 2017 IEEE International Symposium: Thibault Lesieur, Léo Miolane, Marc Lelarge, Florent Krzakala, and Lenka Zdeborová.

Submitted to Journal of Statistical Mechanics: Theory and Experiment JSTAT: ***Constrained Low-rank Matrix Estimation: Phase Transitions, Approximate Message Passing and Applications:*** Thibault Lesieur, Florent Krzakala, Lenka Zdeborová

Phase transitions and optimal algorithms in high-dimensional Gaussian mixture clustering: Communication, Control, and Computing (Allerton), 2016 54rd Annual Allerton page, page 601-608 : Thibault Lesieur, Caterina De Bacco, Jess Banks, Florent Krzakala, Cris Moore, Lenka Zdeborová

Mutual information for symmetric rank-one matrix estimation: A proof of the replica formula : Advances in Neural Information Processing Systems (NIPS 2016), page 424-432 :Jean Barbier, Mohamad Dia, Nicolas Macris, Florent Krzakala, Thibault Lesieur, Lenka Zdeborová

MMSE of probabilistic low-rank matrix estimation: Universality with respect to the output channel : Communication, Control, and Computing (Allerton), 2015 53rd Annual Allerton, page 680-687: Thibault Lesieur, Florent Krzakala, Lenka Zdeborová

Phase Transition in sparse PCA : Information Theory (ISIT), 2015 IEEE International Symposium on information theory, page 1635-1639 :Thibault Lesieur, Florent Krzakala, Lenka Zdeborová

RESEARCH **EXCHANGE WITH SANTA FE INSTITUTE NEW MEXICO USA**

INTERNSHIP Worked with Cris Moore on the problem of clustering. 01/14/2016–05/15/2016

INTERNSHIP AT IPHT (CEA SACLAY FRANCE) WITH LENKA ZDEBOROVA

Study of the finite size effect of the non-backtracking operator. 01/10/2014–03/15/2014

INTERNSHIP AT PHYSIKZENTRUM RWTH (AACHEN GERMANY) WITH MATTHIAS WUTTIG

Experimental internship on solid state physics: Investigation on the pseudo-binary system

$Sn_1Sb_2Te_4$ – $Sn_1Bi_2Te_4$ in the hope of creating an efficient thermoelectric material.

04/08/2013–07/30/2013

**PROFESSIONAL-
EXPERIENCE****POST-DOC SAPIENZA UNIVERSITY SIMONS COLLABORATION:**

Popular science presentator job at Palais de la Découverte (Museum in Paris specialized in popular science). Both public presentation and activity leader on mathematics : 01/01/2018 – Today

POPULAR SCIENCE JOB AT PALAIS DE LA DÉCOUVERTE

Popular science presentator job at Palais de la Découverte (Museum in Paris specialized in popular science). Both public presentation and activity leader on mathematics : 11/01/2014 – 09/01/2016

REVIEW

Reviewed papers for NIPS 2016.

INTERNSHIP IN MONTREAL AT LOTO-QUEBEC

I spent two months working as a software developer in Montreal at Loto-Québec. 07/06/2012–08/25/2012

**PRESENTATIONS
AND
CONFERENCES**

Poster at Les **Houches winter school**: Low rank matrix factorization 02/26/2017 – 02/03/2017: Optimal inference and the zoology of phase diagrams.

Conference on Neural Information Processing Systems NIPS 2016 12/05/2016 Barcelona

2 PhD Day talks at IPHT CEA Saclay on 11/03/2015 and 11/22/2016

PhD student seminar 11/04/2016: General introduction to other PhD student on the problem of Bayesian inference techniques.

Journée de la Matière et des Systèmes Complexes at CEA Saclay 11/07/2016 : Talk on Low rank matrix factorization.

Talk at Statistical physics methods in biology and computer science Paris, a satellite conference of STATPHYS 2016, July 2016: Analyzing data using Bayesian Inference

Poster at workshop on **Physics Informed Machine Learning Santa Fe** January 2016: Low Rank Matrix Factorization

Beg Rohu summer school 08/24/2015 – 09/05/2015: Statistical Physics, Biology, Inference and Networks

Talk at **ISIT 2015, Hong Kong** 06/14/2015-06/19/2015: Phase transition in Sparse PCA. Obtained an ISIT student grant.

Cargese summer school 08/26/2014 - 09/05/2014: Poster on the Non Backtracking-operator for community detection.

RESEARCH INTEREST So far my work has mostly dealt with using tools coming from statistical physics to tackle machine learning problems.
I would like to shift toward problems more linked with real practical learning problems such as control theory or artificial vision.
I also would like to work on the dynamical properties of different machine learning systems. For instance one could analyze the theoretical performance of stochastic gradient descent done on the likelihood of a problem.

REFERENCES Lenka Zdeborová : IPHT CEA Saclay, France : Lenka.Zdeborova@cea.fr
Cris Moore : Santa Fe Institute, Santa Fe, New Mexico USA : moore@santafe.edu
Florent Krzakala : Ecole Normale Supérieure LPS, Paris France : florent.krzakala@ens.fr

LANGUAGE **ENGLISH:** Fluent
FRENCH: Native language
COMPUTER : C, C++, python, Julia

HOBBY Sport: Fencing, Swimming
Development of a little game engine in C++