

Raphaël Berthier

Curriculum Vitae

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Research

- 2021 - ... **Post-doctoral researcher at EPFL (Lausanne, Switzerland), in collaboration with Andrea Montanari and Emmanuel Abbe.**
- 2018-2021 **PhD in the SIERRA team (INRIA, DI ENS, CNRS, in Paris) under the supervision of Francis Bach and Pierre Gaillard.**
Subject: Analysis and Acceleration of Gradient Descents and Gossip Algorithms.
- Spring 2017 **Internship in Stanford University, under the supervision of Andrea Montanari, 4 months.**
Subject: Compressed Sensing and Approximate Message Passing algorithms.

Studies

- 2014-2018 **Studies at the Ecole Normale Supérieure Ulm (Paris).**
- 2016-2017 **Master 2 in probabilities and statistics, University Paris-Sud (Orsay).**
- 2015-2016 **Master 1 in fundamental mathematics, ENS Ulm.**
- Summer 2015 **Internship at Qucit (start-up in Bordeaux, France), 2 months.**
Subject: statistical inference of urban movements, in particular using databases of bicycle-sharing systems.
- 2014-2015 **Bachelor of Science in mathematics and in computer science, "Licence" in french, ENS Ulm.**
- July 2014 **Admitted to the Ecole Normale Supérieure (Paris), competitive exam, section mathematics - physics - computer science.**
- 2012-2014 **Preparation for the competitive exam of the ENS, Mathematics and physics section, Preparation school of the Lycée Marcelin Berthelot, Saint-Maur-des-Fossés.**
- 2012 **Baccalauréat (french high-school degree), Scientific and international english sections.**

Publications and preprints

- 2022 **R. Berthier**, *Incremental Learning in Diagonal Linear Networks*, preprint.
- 2022 **R. Berthier, M. Li**, *Acceleration of Gossip Algorithms through the Euler-Poisson-Darboux Equation*, accepted for publication in the IMA Journal of Applied Mathematics.
- 2021 **C. Gerbelot, R. Berthier**, *Graph-based Approximate Message Passing Iterations*, preprint.

- 2021 **M. Even, R. Berthier, F. Bach, N. Flammarion, P. Gaillard, H. Hendrikx, L. Massoulié and A. Taylor**, *A Continuized View on Nesterov Acceleration for Stochastic Gradient Descent and Randomized Gossip*, Outstanding paper award and oral at Advances in Neural Information Processing Systems (NeurIPS).
- 2020 **R. Berthier, F. Bach and P. Gaillard**, *Tight Nonparametric Convergence Rates for Stochastic Gradient Descent under the Noiseless Linear Model*, Advances in Neural Information Processing Systems (NeurIPS).
- 2020 **R. Berthier, F. Bach and P. Gaillard**, *Accelerated Gossip in Networks of Given Dimension using Jacobi Polynomial Iterations*, SIAM Journal on Mathematics of Data Science.
- 2018 **R. Berthier, A. Montanari and P.-M. Nguyen**, *State Evolution for Approximate Message Passing with Non-Separable Functions*, Information and Inference: a Journal of the IMA.

Research talks

- Oct. 2022 **"Learning and Optimization in Luminy" conference**, CIRM, Marseille.
- Apr. 2022 **Mathematical Engineering department (INMA) seminar**, UC Louvain, Louvain-la-Neuve.
- Feb. 2022 **Information Systems Laboratory Colloquium**, Stanford University.
- Dec. 2021 **NeurIPS oral**, *A Continuized View on Nesterov Acceleration for Stochastic Gradient Descent and Randomized Gossip*, joint work with M. Even, F. Bach, N. Flammarion, P. Gaillard, H. Hendrikx, L. Massoulié and A. Taylor.
- Dec. 2021 **Deep Learning Theory Symposium**, Simons institute, Berkeley.
- Oct. 2021 **FLAIR meeting**, EPFL, Lausanne.
- Aug. 2020 **Bernoulli-IMS One World Symposium 2020**.
- Aug. 2020 **"Statistical physics and machine learning" summer school**, Les Houches, France.
- Nov. 2019 **MIC group meeting**, New York University.
- Nov. 2017 **Golosino seminar**, École Normale Supérieure, Paris.
- Nov. 2017 **SMILE seminar**, Institut Henri Poincaré, Paris.
- Oct. 2017 **Seminar of the SIERRA team**, INRIA Paris.

Teaching

- 2022 **Lecturer in inference on graphs**, *graduate level*, EPFL, Lausanne.
- 2022 **Lecturer in probability and statistics theory**, *undergraduate level*, EPFL, Lausanne.
- 2019-2021 **Teaching assistant in statistical learning**.
Ecole Normale Supérieure, Paris
- 2019-2020 **Lecturer in linear algebra**.
Pluridisciplinary Cycle in Economics and Social sciences, PSL Research University, Paris

2014-2017 **Oral examinations in mathematics in "classe préparatoire" (equivalent to first and second year university students in mathematics).**

at the school Louis-le-Grand, in Paris,

at the school Marcelin Berthelot, in Saint-Maur-des-Fossés, France.