Mathurin Massias

PhD in Machine Learning

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Research experience

Jan 2020 – present	Università di Genova (Genova, Italy): Post-doctoral researcher with L. Rosasco and S. Villa. Statistical learning and optimisation, studying the implicit regularization properties of primal-dual algorithms for structured noisy inverse problems Publications: [2, 3]
Sep. 2016 – Dec. 2019 (3 years)	INRIA (Université Paris-Saclay, France): PhD, supervised by A. Gramfort and J. Salmon. "*High dimensional sparse regression with heteroscedastic noise: application to neural source localization*", obtained Summa cum laude. Keywords: optimisation, neuro-imaging, inverse problems, sparsity, high dimension Publications: [1, 4, 5, 6, 7, 8]
Feb. 2019 – May 2019 (3 months)	U. of Tokyo/RIKEN (Japan), Deep Learning Theory team: intern, supervised by T. Suzuki. Work on gradient Langevin dynamics for non-convex regression in RKHS Keywords: stochastic differential equations Publications: [9]

Education

Sep. 2014 – Apr. 2015	**ENS Cachan** (Cachan, France): MSc in Machine Learning (MVA) Summa cum laude (average grade: 16.8/20)
Sep. 2011 – Apr. 2015	**Ecole Centrale Paris** (Paris, France): Engineering degree Major in Applied Mathematics and Data Science Average grade: 16.3/20

Publications

Journal publications

[1] M. Massias, S. Vaiter, A. Gramfort, and J. Salmon. Dual extrapolation for sparse Generalized Linear Models. *Journal of Machine Learning Research*, 21(234):1–33, 2020.

Proceedings of rank A international conferences

[2] C. Molinari, M. Massias, L. Rosasco, and S. Villa. Iterative regularization for convex regularizers. In *AISTATS*, 2021.

[3] Q. Bertrand and M. Massias. Anderson acceleration of coordinate descent. In *AISTATS*, 2021.

[4] M. Massias*, Q. Bertrand*, A. Gramfort, and J. Salmon. Support recovery and sup-norm convergence rates for sparse pivotal estimation. In *AISTATS*, 2020.

[5] P. Ablin, T. Moreau, M. Massias, and A. Gramfort. Learning step sizes for unfolded sparse coding. In *NeurIPS*, 2019.

[6] Q. Bertrand*, M. Massias*, A. Gramfort, and J. Salmon. Concomitant Lasso with repetitions: beyond averaging multiple realizations of heteroscedastic noise. In *NeurIPS*, 2019.

[7] M. Massias, A. Gramfort, and J. Salmon. Celer: a fast solver for the Lasso with dual extrapolation. In *ICML*, 2018.

[8] M. Massias, O. Fercoq, A. Gramfort, and J. Salmon. Heteroscedastic multitask concomitant lasso for sparse multimodal regression. In *AISTATS*, 2018.

Preprints

[9] B. Muzellec, K. Sato, M. Massias, and T. Suzuki. Dimension-free convergence rates for gradient Langevin dynamics in RKHS. 2020. URL: https://arxiv.org/abs/2003.00306.

Teaching

2020 – 2021 (40 h)	École Polytechnique Executive Education: Teacher for the *Data Science Starter Program*
2019 – 2021 (42 h)	École Polytechnique/HEC "Data Science for Business" Master: Teacher for the *Python for Data Science* class
2017 – 2019 (2 × 40 h)	Université Paris-Saclay "Data Science" Master: Teaching assistant and partial lecturer for the *Optimization for Data Science* class
2016 – 2017 (56 h)	Télécom Paris: Teaching assistant for: Analysis and Probabilities (MDI 113/114, Bachelor, 10 h) Machine Learning and Data Mining (MDI 343, Executive Master, 20 h) Linear Models (SD 204, Master, 10 h) Practical Machine Learning (SD 207, Master, 10 h) Tools and applications for signals and images (SI 101, Bachelor, 6 h)

Open source software

Summary on my GitHub page: https://github.com/mathurinm

- celer (python implementation of fast algorithms to solve sparse Generalized Linearized Models): lead developer
- blitz (algorithms for sparse regression): maintainer after original author left academia
- benchopt (automatic benchmarking of optimization packages on standard ML tasks): core developer
- scikit-learn (machine learning in python): contributor
- MNE-python (brain imaging with magneto and electro-encephalographic modalities): contributor

Community service

Reviewer for NeurIPS 2020 (top 10 % reviewer), 2019 (top 400), 2018 (top 800), ICML 2020, 2019, AISTATS 2021, 2020, SPARS 2019, ACML 2019, 2018, and for JMLR, SIAM Journal on Optimization, IEEE TSP, Signal Processing.

Grants and awards

- 2019: Best PhD prize of Programme Gaspard Monge Optimisation (PGMO)
- 2019: Best PhD prize of Télécom Paris
- 2018: 1500 € from the GdR ISIS to fund a 1 month visit to the University of Washington (Seattle, USA)
- 2018: 1000 € from the STIC doctoral school to fund SPARS 2017 conference and summer school attendance
- 2017: Best presentation award at JDSE conference (Orsay, France)

Selected invited talks

- LCSL seminar, University of Genova, 01/2020: *"Support recovery and sup-norm convergence rates for sparse pivotal estimation"*.
- SIERRA team seminar, Inria (Paris), 12/2019: *"The smoothed multivariate square-root Lasso: optimizational and statistical handling of correlated noise"*.
- IMAG Probability and Statistics seminar, Université de Montpellier (Montpellier, France), 09/2019: *"Concomitant Lasso with repetitions: smoothing the nuclear norm to handle non homoscedastic noise"*.
- Data-Driven Biomedical Science team seminar, Riken AIP (Nagoya), 04/2019: *"Exploiting regularity in sparse Generalized Linear Models solvers"*.
- MOKAPLAN team seminar, Inria (Paris), 12/2018: *"Dual extrapolation for sparse Generalized Linear models"*.
- MILO team seminar, EPFL (Lausanne), 12/2018: *"Celer: a fast solver for the Lasso with duality improvements"*.
- University of Washington (Seattle), 05/2018: *"Solving Lasso-type problems with aggressive Gap safe rules"*.
- CMStats (London), 12/2017: *"From safe screening rules to working sets for faster Lasso-type solvers"*.