Guillaume Garrigos

Curriculum Vitae

Personal information and contact

- Born in Toulouse (France), May 8th 1989.
- Université Paris Cité, Place Aurélie Nemours, 75013 Paris, France.
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Current position (2018–)

position	**Maître de conférences** at Université Paris Cité
affiliation	Laboratoire de Probabilités, Statistique et Modélisation
research interests	optimization, statistical machine learning, inverse problems, image and signal processing, algorithms and continuous dynamical systems, tame optimization.

Previous positions (2012–2018)

2017–2018	**Post-doc**, *École Normale Supérieure*, Paris, France. Main collaborator : Gabriel Peyré (ENS, CNRS, INRIA) Research themes : inverse problems, signal and image processing, optimization
2015–2017	**Post-doc**, *Istituto Italiano di Tecnologia*, Genoa, Italy. Main collaborators : Lorenzo Rosasco (IIT, MIT) and Silvia Villa (IIT) Research themes : optimization and regularization methods for machine learning.
2012–2015	**Ph.D.**, *Université de Montpellier & Universidad Santa Maria*, France & Chile. Supervisors : Hédy Attouch (UM) and Juan Peypouquet (USM) Subject : Dynamical systems for tame optimization and multi-objective problems

Education and Degrees

2013	**Agrégation de Mathématiques**, ranked 147/323.
2010–2012	**Master**, *Université de Montpellier*, Mathématiques, Statistiques et Applications.
2007–2010	**Licence**, *Université de Montpellier*, Mathématiques Fondamentales et Appliquées.
2007	**Baccalauréat**, *Lycée Diderot*, Narbonne.

Publications

Publications in international specialized journals.

- G. Garrigos, L. Rosasco and S. Villa. *Accelerated iterative regularization via dual diagonal descent*, SIAM Journal on Optimization, Vol. 31, No. 1, pp. 754–784, 2021.
- G. Garrigos, L. Rosasco and S. Villa. *Thresholding gradient methods in Hilbert spaces: support identification and linear convergence*, ESAIM: Control, Optimisation and Calculus of Variations, Vol. 26 (28), 2020.
- G. Garrigos, L. Rosasco and S. Villa. *Iterative regularization via dual diagonal descent*, Journal of Mathematical Imaging and Vision, Vol. 60, No. 2, pp. 189–215, 2018.
- G. Garrigos, L. Rosasco and S. Villa. *Convergence of the Forward-Backward algorithm: beyond the worst case with geometry*, Mathematical Programming, Vol. 198, pp. 937–996, 2023.
- H. Attouch, G. Garrigos and X. Goudou. *A dynamic gradient approach to Pareto optimization with nonsmooth convex objective functions*, Journal of Mathematical Analysis and Applications, Vol. 422, No. 1, pp. 741–771, 2015.
- P. Frankel, G. Garrigos and J. Peypouquet. *Splitting methods with variable metric for KL functions and general convergence rates*, Journal of Optimization Theory and Applications, Vol. 165, No. 3, pp. 874–900, 2015.

Publications in international conferences.

- M. Hihat, S. Gaïffas, G. Garrigos and S. Bussy. *Online Inventory Problems: Beyond the i.i.d. Setting with Online Convex Optimization*, Advances in Neural Information Processing Systems, Vol. 36, 2024.
- J. Domke, G. Garrigos and R. M. Gower. *Provable convergence guarantees for black-box variational inference*, Advances in Neural Information Processing Systems, Vol. 36, 2024.
- J. Chen, R. Yuan, G. Garrigos and R. M. Gower. *SAN: Stochastic Average Newton Algorithm for Minimizing Finite Sums*, 25th International Conference on Artificial Intelligence and Statistics (AISTATS), PMLR, Vol. 151, pp. 279–318, 2022.
- G. Garrigos, L. Rosasco and S. Villa. *Sparse Multiple Kernel Learning: Support Identification via Mirror Stratifiability*, IEEE 26th European Signal Processing Conference (EUSIPCO), pp. 1077–1081, 2018.
- J. Fadili, G. Garrigos, J. Malick and G. Peyré. *Model Consistency for Learning with Mirror-Stratifiable Regularizers*, 22nd International Conference on Artificial Intelligence and Statistics (AISTATS), PMLR, Vol. 89, pp. 1236–1244, 2019.
- G. Garrigos, L. Rosasco and S. Villa. *Iterative regularization via a dual diagonal descent method*, 9th NIPS Workshop on Optimization for Machine Learning, 2016.

Preprints.

○ R. M. Gower, G. Garrigos, N. Loizou, D. Oikonomou, K. Mishchenko, F. Schaipp. *Analysis of an Idealized Stochastic Polyak Method and its Application to Black-Box Model Distillation*. Preprint on arXiv:2504.01898.

○ M. Hihat, G. Garrigos, A. Fermanian and S. Bussy. *Multivariate Online Linear Regression for Hierarchical Forecasting*. Preprint on arXiv:2402.14578.

○ G. Garrigos, R. M. Gower, U. Simsekli and F. Schaipp. *SGD with Clipping is Secretly Estimating the Median Gradient*. Preprint on arXiv:2402.12828.

○ G. Garrigos, R. M. Gower and F. Schaipp. *Function Value Learning: Adaptive Learning Rates Based on the Polyak Stepsize and Function Splitting in ERM*. Preprint on arXiv:2307.14528.

○ G. Garrigos and R. M. Gower. *Handbook of Convergence Theorems for (Stochastic) Gradient Methods*. Preprint on arXiv:2301.11235.

○ G. Garrigos. *Square distance functions are Polyak-Łojasiewicz and vice-versa*. Preprint on arXiv:2301.10332.

○ H. Attouch and G. Garrigos. *Multiobjective optimization : an inertial dynamical approach to Pareto optima*. Preprint on arXiv:1506.02823.

Miscellaneous

2021	Idex grant for a pedagogical project funded by Université Paris Cité, 20k EUR.
2019	PEPS grant funded by INSMI (CNRS), 3,5k EUR.
2017	SMAI-MODE Dodu Prize for the best young researcher talk: *Structured sparsity in inverse problems and support recovery with mirror-stratifiable functions*.

Responsibilities

Student supervision

2023-2026	Lucas Ketels. PhD thesis.
2023	Julien Marie-Anne. Undergrad project.
2023	Lucas Ketels. Undergrad thesis.
2021-2024	Massil Hihat. PhD thesis.

Seminars, Events

2019	Co-organizer of the workshop "*Regularisation for Inverse Problems and Machine Learning*", in Paris ⊙
2018	Co-organizer of the session "*Dimensionality reduction tools for learning: A sketchy session*" for the International Symposium on Mathematical Programming (ISMP)
2017	Organizer of the NORIA group meeting at ENS
2017	Co-organizer of the Machine Learning summer school RegML 2017, in Oslo ⊙
2015–2017	Organizer of the Machine Learning Tutorials, between the LCSL groups at IIT (Genova) and MIT (Boston)