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: algorithms and continuous dynamical systems, deterministic and stochastic methods, convex and tame problems. Inverse problems: statistical machine learning, image and signal processing.

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.

- 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. Simeskli and F. Schaipp. *SGD with Clipping is Secretly Estimating the Median Gradient*. Preprint on arXiv:2402.12828.
- 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)