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.

- 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.

Teaching

2023-2024	Mathématiques 1, CM-TD, L1, 45h
	Optimization for Machine Learning, CM, M2, 36h ☉
	Calcul Différentiel, TD, L3, 36h
	Optimisation, CM-TD, M1, 66h ☉
2022-2023	Mathématiques 1, CM-TD, L1, 45h
	Optimization for Machine Learning, CM, M2, 36h ☉
	Calcul Différentiel, TD, L3, 36h
	Optimisation, CM-TD, M1, 66h ☉
2021-2022	Optimisation, CM, L3, 36h ☉
	Optimization for Machine Learning, CM, M2, 36h ☉
	Optimisation, TD, M1, 30h
	Calcul Différentiel, TD, L3, 36h
2020-2021	Optimisation, CM-TD-TP, L3, 78h ☉
	Optimization for Machine Learning, CM, M2, 36h ☉
	Théorie de l'Information, TD, M1, 36h
	Analyse Numérique Matricielle, TD-TP, L3, 42h
2019-2020	Optimisation, CM-TD-TP, L3, 78h ☉
	Optimization for Machine Learning, CM, M2, 36h ☉
	Théorie de l'Information, TD, M1, 36h
	Analyse Numérique Matricielle, TD-TP, L3, 42h
2018-2019	Optimisation, TD, L3, 36h
	Théorie de l'Information, TD, M1, 36h
	Analyse Numérique Matricielle, TD-TP, L3, 54h
2016-2017	Machine Learning, TP, M, 8h (Part of the RegML 2017 Summer School) ☉
2014-2015	Algèbre Linéaire, CM-TD, L1, 128h
2012-2013	Algèbre Linéaire, CM-TD, L1, 64h

Miscellaneous

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)

Editorial Activity

I am reviewing for various journals: SIAM Journal on Optimization, SIAM Journal on Imaging Science, Mathematics of Operations Research, Optimization, Mathematical Methods of Operations Research, Journal of Optimization Theory and Applications, Computational and Applied Mathematics, IEEE Computational Intelligence Magazine.

List of given research talks

- 2023-12-13 NeurIPS. New Orleans, U.S.A..
- 2023-10-19 Journées du GdR MOA. Université de Perpignan Via Domitia, Perpignan, France.
- 2023-10-16 Mini-cours du GdR MOA. Université de Perpignan Via Domitia, Perpignan, France.
- 2023-06-19 Optimization at Bernoulli Institute. University of Groningen, Groningen, Netherlands.
- 2022-07-30 Journées Franco-Chiliennes d'Optimisation. Perpignan, France.
- 2022-06-01 Groupe de Travail – Réseaux de Neurones. Université Paris Cité, Paris, France.
- 2022-05-16 Seminar. Center for Computational Mathematics, Simons Foundation, New York, U.S.A..
- 2019-12-04 Journées PGMO. Palaiseau, France.
- 2019-11-28 SMILE Seminar. ENS, Paris, France.
- 2019-08-07 ICCOPT. Technical University, Berlin, Germany.
- 2019-06-21 Séminaire Modélisation, Optimisation, Dynamique . XLIM, Limoges, France.
- 2019-05-22 Machine Learning Seminar. LCSL, Genova, Italy.
- 2019-05-13 Biennale de la SMAI. Guidel, France.
- 2019-04-17 AISTATS. Okinawa, Japan.
- 2019-03-21 Groupe de Travail Modélisation. LPSM, Paris, France.
- 2019-02-21 Science communication. Université de Paris, Paris, France.
- 2019-02-18 Séminaire Parisien de Statistique. IHP, Paris, France.
- 2019-02-14 Séminaire d'Analyse non linéaire et Optimisation. LMA, Avignon, France.
- 2018-09-03 European Signal Processing Conference (EUSIPCO). Roma, Italy.
- 2018-07-01 International Symposium on Mathematical Programming (ISMP). IMB, Bordeaux, France.
- 2018-06-05 SIAM Conference on Imaging Science. Bologna, Italy.
- 2018-05-21 Inverse Problems: Modeling and Simulation conference. Malta, Malta.
- 2018-05-05 Journée Parcimonie et Applications du GdR MIA. IMB, Bordeaux, France.
- 2018-04-16 Séminaire Signal, Statistique et Apprentissage. Telecom, Paris, France.
- 2018-03-28 Journées SMAI-MODE. Grenoble, France.
- 2018-02-20 Séminaire commun de Statistique P6-P7. Paris Diderot, Paris, France.
- 2018-02-07 Séminaire Images Optimisation et Probabilités. IMB, Bordeaux, France.
- 2018-01-29 Machine Learning Seminar. LCSL, Genova, Italy.
- 2018-01-23 Séminaire du Centre de Vision Numérique. Centrale Supélec, Paris, France.
- 2018-01-15 Mathematics and Image Analysis conference. Humboldt University, Berlin, Germany.
- 2017-12-14 Workshop on Dynamics and Algorithms in Convex Optimization. Universidad de Chile, Santiago, Chile.
- 2017-12-11 V-Coloquio. Pontifica Universidad Catolica de Valparaiso, Valparaiso, Chile.
- 2017-12-07 Séminaire LJK-Probabilités et Statistique. LJK, Grenoble, France.

- 2017-11-18 Workshop on Gradient dynamics, convergence and related topics. UPMC, Paris, France.
- 2017-10-17 Journées du GDR MOA-MIA. IMB, Bordeaux, France.
- 2017-10-17 Optimization 2017. Lisboa, Portugal.
- 2017-07-05 Journées Franco-Chiliennes d'Optimisation. IMT, Toulouse, France.
- 2017-02-14 Séminaire SIERRA. INRIA, Paris, France.
- 2017-02-09 Séminaire Mathématiques de l'apprentissage. IMT, Toulouse, France.
- 2016-12-19 Seminario del Departamento de Matematica. Universidad Santa Maria, Valparaiso, Chile.
- 2016-12-14 Seminar of Optimization and Equilibrium. CMM, Santiago, Chile.
- 2016-12-10 NIPS. Barcelona, Spain.
- 2016-08-09 ICCOPT. Tokyo, Japan.
- 2016-03-23 Journées SMAI-MODE. Toulouse, France.
- 2016-02-08 Séminaire SPOT. Toulouse, France.
- 2015-12-02 Journées annuelles du GdR MOA. Université de Bourgogne, Dijon, France.
- 2015-07-14 International Symposium on Mathematical Programming. Pittsburgh, USA.
- 2015-03-04 Séminaire Statistiques, Probabilités, Optimisation et Contrôle. Université de Bourgogne, Dijon, France.
- 2014-12-04 Encuentro anual de la Sociedad Matematica de Chile (SOMATCHI). Quinamavida, Chile.
- 2014-10-30 Seminario del Departamento de Matematica. Universidad Santa Maria, Valparaiso, Chile.
- 2014-09-08 Franco-Italian Workshop. LCSL, Sestri-Levante, Italia.
- 2014-09-02 Séminaire ACSIOM. IMAG, Montpellier, France.
- 2014-03-26 Journées SMAI-MODE. Rennes, France.
- 2013-12-12 Seminario DMAT. Universidad Santa Maria, Valparaiso, Chile.
- 2013-09-25 Seminar of Optimization and Equilibrium. CMM, Santiago, Chile.
- 2013-06-17 Journées annuelles du GdR MOA. IHP, Paris, France.

List of Science Communication activities

- 2024-02-08 Exposé: Stagiaires 3e. Université Paris Cité, Paris.
- 2023-02-15 Exposé: Stagiaires 3e. Université Paris Cité, Paris.
- 2022-12-01 Animation: Conférence et ateliers pour des élèves de lycée. IHP, Paris.
- 2022-10-15 Animation: Fête de la Science. Jussieu, Paris.
- 2022-06-05 Animation: Salon Culture et Jeux Mathématiques. Place St. Sulpice, Paris.
- 2022-02-17 Exposé: Stagiaires 3e. Université Paris Cité, Paris.
- 2021-11-23 Conférence grand public: Le mois de l'Optimisation. Palais des Congrès, Perpignan.
- 2019-02-21 Exposé: Stagiaires 3e. Université Paris Cité, Paris.
- 2018-10-08 Animation: Fête de la Science. Lycée, Paris.