



# Guillaume Garrigos

## Curriculum Vitae

### Personal information and contact

- 👤 Born in Toulouse (France), May 8th 1989.
- ✉ Université Paris Cité, Place Aurélie Nemours, 75013 Paris, France.
- @ guillaume.garrigos@lpsm.paris
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### Current position (2018– )

- position **Maître de conférences** at Université Paris Cité
- affiliation Laboratoire de Probabilités, Statistique et Modélisation
- research Optimization: algorithms and continuous dynamical systems, deterministic and
- interests 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 : Hédya 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. 

## Teaching

- 2024-2025 Mathématiques 1, CM-TD, L1, 90h  
Calcul Différentiel, CM, L3, 42h 🏆  
Optimization for Machine Learning, CM, M2, 36h 🏆  
Optimisation, CM, M1, 36h 🏆
- 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

- 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)

### 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.

### 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.