



# Guillaume Garrigos

## Curriculum Vitae

### Personal information and contact

- 👤 Born in Toulouse (France), May 8th 1989.
- ✉ Bâtiment Sophie Germain, Université de Paris, 75205 Paris CEDEX 13, France.
- @ guillaume.garrigos@lpsm.paris
- 🌐 <http://guillaume-garrigos.com>

### Current position (2018– )

- position **Maître de conférences** at Université de Paris
- affiliation Laboratoire de Probabilités, Statistique et Modélisation (LPSM, UMR 8001)
- research optimization, statistical machine learning, inverse problems, image and signal processing, algorithms and continuous dynamical systems, tame optimization.
- interests

### Previous positions (2015–2018)

- 2017–2018 **Post-doc**, *École Normale Supérieure*, Paris, France.  
Lab: Département de Mathématiques et Applications  
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.  
Lab: Laboratory for Computational and Statistical Learning  
Main collaborators : Lorenzo Rosasco (IIT, MIT) and Silvia Villa (IIT)  
Research themes : optimization and regularization methods for machine learning.

### Ph.D. thesis (2012–2015)







- title *Descent dynamical systems and algorithms for tame optimization and multi-objective problems* 📖
- university Université de Montpellier (France) and Universidad Santa Maria (Valparaíso, Chile)
- supervisors Hédya Attouch (UM) and Juan Peypouquet (USM)
- committee Hédya Attouch, Aris Daniilidis, Jalal Fadili, Pedro Gajardo, Adrian Lewis, Juan Peypouquet, Lionel Thibault

## 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.

- 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 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

- 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

### 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

- 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 PGM. 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

- 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.