

Francis Bach

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Education

- 2009 Habilitation à diriger les recherches, Ecole Normale Supérieure, Cachan, France
- 2005 Ph.D. in Computer Science, University of California, Berkeley, CA, USA
Dissertation: “Machine learning for blind source separation”
Advisor: Prof. Michael I. Jordan.
- 2000 M.S. in Applied Mathematics, Ecole Normale Supérieure, Cachan, France
- 2000 Master of Public Administration (M.P.A.), Corps National des Mines, Paris, France
- 1997 B.S. in Mathematics, Ecole Polytechnique, Palaiseau, France

Professional experience

- 2007 - present Research faculty, INRIA - Ecole Normale Supérieure, Paris, France
 Head of SIERRA project-team (since 2011)
 Member of WILLOW project-team (2007-2010)
- 2005 - 2007 Assistant Professor, Ecole des Mines de Paris, Fontainebleau, France

Awards and distinctions

- 2024 Roberto Tempo best Conference on Decision and Control paper award
- 2021 Neurips Conference Test of time award and outstanding paper award
- 2020 Election at the French Academy of Sciences
- 2019 Prix Jean-Jacques Moreau
- 2019 Test of time award (10-year best paper award), ICML conference
- 2018 NeurIPS conference best paper award
- 2018 Lagrange Prize in continuous optimization
- 2018 Thomson-Reuters / Clarivate highly-cited researcher (also in 2014 and 2017)
- 2016 European Research Council (ERC) consolidator grant
- 2015 Schlumberger Chair, Institut des Hautes Etudes Scientifiques
- 2014 Test of time award (10-year best paper award), ICML conference
- 2012 INRIA Young Researcher Prize
- 2009 European Research Council (ERC) starting investigator grant
- 2005 Eli Jury Award, U.C. Berkeley (Best thesis in signal processing)
- 2005 Best student paper award, AISTATS conference
- 2004 Best paper, honorable mention, ICML conference

Professional activities

President of the board of the International Conference on Machine Learning (ICML), 2021-2023
Co-editor-in-Chief, Journal of Machine Learning Research (JMLR), 2018-2023
Series Editor, Adaptive Computation and Machine Learning, MIT Press, since 2016

Selected publications

69,000 citations (<https://scholar.google.fr/citations?user=6PJWcFEAAAAJ>)

- F. Bach. *Learning Theory from First Principles*, MIT Press, 2024.
- F. Bach, L. Chizat. Gradient Descent on Infinitely Wide Neural Networks: Global Convergence and Generalization. Proceedings of the International Congress of Mathematicians, 2022.
- L. Chizat, F. Bach. On the Global Convergence of Gradient Descent for Over-parameterized Models using Optimal Transport. *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.
- L. Pillaud-Vivien, A. Rudi, F. Bach. Statistical Optimality of Stochastic Gradient Descent on Hard Learning Problems through Multiple Passes. *Advances in Neural Information Processing Systems (NeurIPS)*, 2018.
- F. Bach. Submodular Functions: from Discrete to Continuous Domains. *Mathematical Programming*, 2018.
- D. Scieur, A. d’Aspremont, F. Bach. Regularized Nonlinear Acceleration. *Advances in Neural Information Processing Systems (NIPS)*, 2016
- A. Dieuleveut, F. Bach. Non-parametric Stochastic Approximation with Large Step sizes. *The Annals of Statistics*, 44(4):1363-1399, 2016.
- F. Bach. Duality between subgradient and conditional gradient methods. *SIAM Journal of Optimization*, 25(1):115-129, 2015
- J. Mairal, F. Bach, J. Ponce. Sparse Modeling for Image and Vision Processing. *Foundations and Trends in Computer Vision*, 8(2-3):85-283, 2014
- F. Bach. Learning with Submodular Functions: A Convex Optimization Perspective. *Foundations and Trends in Machine Learning*, 6(2-3):145-373, 2013
- F. Bach and E. Moulines. Non-strongly-convex smooth stochastic approximation with convergence rate $O(1/n)$. *Advances in Neural Information Processing Systems (NIPS)*, 2013
- N. Le Roux, M. Schmidt, F. Bach. A stochastic gradient method with an exponential convergence rate for strongly-convex Optimization with Finite Training Sets. *Advances in Neural Information Processing Systems (NIPS)*, 2013
- F. Bach, R. Jenatton, J. Mairal, G. Obozinski. Structured sparsity through convex optimization. *Statistical Science*, 27(4):450-468, 2012
- J. Mairal, F. Bach, J. Ponce, G. Sapiro. Online learning for matrix factorization and sparse coding. *Journal of Machine Learning Research*, 11:10-60, 2010
- F. Bach. Consistency of the group Lasso and multiple kernel learning. *Journal of Machine Learning Research*, 9:1179-1225, 2008
- A. d’Aspremont, F. Bach and L. El Ghaoui. Optimal solutions for sparse principal component analysis. *Journal of Machine Learning Research*, 9:1269-1294, 2008
- F. Bach, M. I. Jordan, Learning spectral clustering, with application to speech separation. *Journal of Machine Learning Research*, 7:1963-2001, 2006
- F. Bach, D. Heckerman, E. Horvitz, Considering cost asymmetry in learning classifiers. *Journal of Machine Learning Research*, 7:1713-1741, 2006
- F. Bach, G. R. G. Lanckriet, M. I. Jordan. Multiple kernel learning, conic duality, and the SMO algorithm. *Proceedings of the International Conference on Machine Learning (ICML)*, 2004
- F. Bach, M. I. Jordan. Kernel independent component analysis. *Journal of Machine Learning Research*, 3:1-48, 2002