Adil Salim

Research in Machine Learning

asalim.math@gmail.com
adil-salim.github.io
adil-salim
AdilSlm
adil-salim

Employment

(Expected) 2022–... **Senior Researcher**, *Microsoft Research*, Redmond, USA.
Machine Learning Foundations group.

Fall 2021 **Google Research Fellow**, *Simons Institute*, UC Berkeley, Berkeley, USA.
Program: Geometric Methods in Optimization and Sampling.

2019–2021 **Postdoctoral researcher**, *KAUST*, Visual Computing Center, Thuwal, KSA.
Host: Peter Richtárik.

2018 **Chief Technical Officer**, *Revna Sciences*, Paris, France, Consulting in R&D.

Fall 2015 **Freelance data scientist**, *ThePriceHub.com*, Paris, France, Priced industrial custom parts.

Summer 2015 **Freelance data scientist**, *Kwanko*, Bourg-la-Reine, France, Developed a Real Time Bidding algorithm.

Summer 2015 **Internship**, *CREST-ENSAE*, Malakoff, France, Free stochastic calculus and Large random matrices.
Supervisor: Philippe Biane

Summer 2014 **Internship**, *Insight-UCD*, Dublin, UK, Importance sampling, MCMC methods.
Supervisor: Florian Maire

Summer 2013 **Auditor**, *Deloitte*, Neuilly-sur-Seine, France, Audited banks and insurance companies.

Education

2015–2018 **Ph.D**, *Telecom Paris and Paris–Saclay University*, Paris, France, Research in optimization for machine learning.
Summa cum laude. Defended on November 26, 2018.
Title: Random monotone operators and application to stochastic optimization
Supervisors: Pascal Bianchi, Walid Hachem
Jury president: Antonin Chambolle
Referees: Jérôme Bolte, Bruno Gaujal
Examiner: Panayotis Mertikopoulos
Invited: Jérémie Jakubowicz, Eric Moulines

2014–2015 **M.Sc**, *Paris–Saclay University*, Orsay, France, Probability-Statistics.
Magna cum laude

2012–2015 **M.Sc**, *ENSAE Paris*, Malakoff, France, Data Science and Statistical Engineering.
Top 3 Master's thesis out of ∼200 students
Title: Free stochastic calculus: Processes with free increments
Supervisor: Philippe Biane
Jury: Alexandre Tsybakov

2009–2012 **Preparatory Classes for the "Grandes Ecoles"**, *Lycée Lakanal*, Sceaux, France, Mathematics/Physics.
Three-year undergraduate intensive course

2009 **Baccalauréat Scientifique**, *Lycée Mistral*, Fresnes, France, Spe. Mathematics.
Summa cum laude

Awards and distinctions

2021 **Google Research Fellowship, Simons Institute, UC Berkeley**.
2020 **Top 33% ICML reviewer**.
2019 **NeurIPS spotlight paper**.
2019 **Top 50% NeurIPS reviewer**.
2018 **GDR ISIS Travel Grant for PhD mobility**, *EPFL, Lausanne, Switzerland*.
2018 **NeurIPS Workshop Black in AI Travel Grant**, *Montreal, Canada*.
2017 **NIPS Workshop Black in AI Travel Grant**, *Los Angeles, USA*.
2015 **Top 3 Master's thesis out of nearly 200 students**, *ENSAE Paris, Malakoff, France*.
2009–2012 **Merit Scholarship**, *Lycée Lakanal, Sceaux, France*.

Publications

[1] Adil Salim, Lukang Sun, Peter Richtárik. Complexity Analysis of Stein Variational Gradient Descent Under Talagrand's Inequality T1. *arXiv preprint arXiv:2106.03076*, June 2021.

[2] Adil Salim, Laurent Condat, Dmitry Kovalev and Peter Richtárik. An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints. *arXiv preprint arXiv:2102.11079*, February 2021.

[3] Adil Salim and Peter Richtárik. Primal Dual Interpretation of the Proximal Stochastic Gradient Langevin Algorithm. *NeurIPS 2020*.

[4] Adil Salim, Anna Korba and Giulia Luise. The Wasserstein Proximal Gradient Algorithm. *NeurIPS 2020*.

[5] Dmitry Kovalev, Adil Salim and Peter Richtárik. Optimal and Practical Algorithms for Smooth and Strongly Convex Decentralized Optimization. *NeurIPS 2020*.

[6] Anna Korba, Adil Salim, Michael Arbel, Giulia Luise and Arthur Gretton. A Non-Asymptotic Analysis for Stein Variational Gradient Descent. *NeurIPS 2020*.

[7] Adil Salim, Laurent Condat, Konstantin Mishchenko and Peter Richtárik. Dualize, Split, Randomize: Fast Nonsmooth Optimization Algorithms. *NeurIPS 2020 Workshop OPT2020: Optimization for Machine Learning*.

[8] Sélim Chraibi, Ahmed Khaled, Dmitry Kovalev, Adil Salim, Peter Richtárik and Martin Takáč. Distributed Fixed Point Methods with Compressed Iterates. *arXiv preprint arXiv:1912.09925*, December 2019.

[9] Sélim Chraibi, Adil Salim, Samuel Horváth, Filip Hanzely and Peter Richtárik. Learning To Optimize Via Dual Space Preconditioning. *Technical Report*, September 2019.

[10] Adil Salim. A Strong Law of Large Numbers for Random Monotone Operators. *arXiv preprint arXiv:1910.04405*, October 2019.

[11] Adil Salim, Dmitry Kovalev and Peter Richtárik. Stochastic Proximal Langevin Algorithm: Potential Splitting and Nonasymptotic Rates. *NeurIPS 2019*.

[12] Michael Arbel, Anna Korba, Adil Salim and Arthur Gretton. Maximum Mean Discrepancy Gradient Flow. *NeurIPS 2019*.

[13] Anna Korba, Adil Salim, Michael Arbel and Arthur Gretton. Yet another look at Stein Variational Gradient Descent. *ICML 2019 Workshop on Stein's Method*.

[14] Pascal Bianchi, Walid Hachem and Adil Salim. A Fully Stochastic Primal-Dual Algorithm. *Optimization Letters*, June 2020.

[15] Adil Salim and Walid Hachem. On the Performance of the Stochastic FISTA. *Technical Report*, March 2019.

[16] Adil Salim, Pascal Bianchi and Walid Hachem. Snake: a Stochastic Proximal Gradient Algorithm for Regularized Problems over Large Graphs. *IEEE Transaction on Automatic Control*, May 2019.

[17] Pascal Bianchi, Walid Hachem and Adil Salim. A constant step Forward-Backward algorithm involving random maximal monotone operators. *Journal of Convex Analysis*, May 2019.

[18] Pascal Bianchi, Walid Hachem and Adil Salim. Constant step stochastic approximations involving differential inclusions: Stability, long-run convergence and applications. *Stochastics*, 2018.

[19] Sholom Schechtman, Adil Salim and Pascal Bianchi. Passty Langevin. *CAp 2019*.

[20] Adil Salim, Pascal Bianchi and Walid Hachem. A Constant Step Stochastic Douglas-Rachford Algorithm with Application to Non Separable Regularization. *IEEE ICASSP 2018*.

[21] Adil Salim, Pascal Bianchi and Walid Hachem. A Stochastic Proximal Point Algorithm for Total Variation Regularization over Large Scale Graphs. *IEEE CDC 2016*.

[22] Adil Salim, Pascal Bianchi and Walid Hachem. Snake: a Stochastic Proximal Gradient Algorithm for Regularized Problems over Large Graphs. *NIPS 2017 Workshop Black in AI*.

[23] Rahul Mourya, Pascal Bianchi, Adil Salim and Cédric Richard. An adaptive Distributed Asynchronous Algorithm with Application to Target Localization. *IEEE CAMSAP 2017*.

[24] Pascal Bianchi, Walid Hachem and Adil Salim. Convergence d'un algorithme du gradient proximal stochastique à pas constant et généralisation aux opérateurs monotones aléatoires. *GRETSI 2017*.

[25] Adil Salim, Pascal Bianchi and Walid Hachem. Snake: a Stochastic Proximal Gradient Algorithm for Regularized Problems over Large Graphs. *CAp 2017*.

Professional activities

Reviewing

2019–... **Area chair**, *Black in AI Neurips workshop 2019, 2020, 2021*.

2017–... **Reviewer**, *Conferences: NeurIPS 2019, 2020, 2021, ICML 2020, 2021, ICLR 2021, 2022, ACM SIGKDD 2021. Journals: Journal of Machine Learning Research, Journal of the Royal Statistical Society: Series B, Set-Valued and Variational Analysis, Applied Mathematics and Optimization, IEEE Transactions on Information Theory, IEEE Transactions on Signal and Information Processing over Networks, IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, Automatica, Numerical Algorithms, Journal of Mathematical Analysis and Applications, Journal of Scientific Computing, Rendiconti del Circolo Matematico di Palermo, Mathematics of Operations Research, Black in AI Neurips workshop 2018, BlackAIR 2021*.

Organization

2020 **Co-organizer of a mini symposium [Cancelled due to Covid-19 outbreak]**, *SIAM Conference on Optimization 2020*, Hong-Kong, Title: Gradient flows and interactions between optimization and simulation algorithms (two sessions).

2020 **Co-organizer of a mini symposium [Cancelled due to Covid-19 outbreak]**, *SIAM Conference on Optimization 2020*, Hong-Kong, Title: Recent advances in primal-dual splitting for convex optimization.

Selected talks

October 2021 **Primal–Dual Davis–Yin algorithm(s)**, *INFORMS annual meeting*, Los Angeles, USA.

September 2021 **Primal–Dual interpretation of the proximal gradient Langevin algorithm**, *Workshop on Sampling Algorithms and Geometries on Probability Distributions*, Simons Institute, UC Berkeley, USA.

July 2021 **An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints**, *EurOPT 2021*, Toulouse (Online), France.

June 2021 **An Optimal Algorithm for Strongly Convex Minimization under Affine Constraints**, *Research Seminar*, University of Genova (Online), Italy.

March 2021 **Primal–dual optimization and application to decentralized optimization**, *Machine Learning and Data Analytics Symposium (MLDAS) 2021*, Seattle (Online), USA.

March 2021 **Sampling as an Optimization task**, *Research Seminar*, Qatar Computing Research Institute (Online), Qatar.

March 2021 **Sampling as an Optimization task**, *Research Seminar*, MBZUAI, Abu Dhabi (Online), UAE.

March 2021 **From Dynamics to Complexity of Machine Learning algorithms**, *Research Seminar*, KAUST (Online), KSA.

February 2021 **Primal–dual optimization and applications to decentralized optimization and sampling**, *Research Seminar*, Microsoft Research, Redmond (Online), USA.

September 2020 **Primal Dual Interpretation of the Proximal Stochastic Gradient Langevin Algorithm**, *Second Symposium on Machine Learning and Dynamical Systems*, Fields Institute, Toronto (Online), Canada.

December 2019 **Stochastic Proximal Langevin Algorithm**, *NeurIPS*, Vancouver, Canada.

November 2019 **Langevin as an Optimization algorithm**, *Computer Science Graduate Seminar*, KAUST, KSA.

August 2019 **On Stochastic Primal–Dual Algorithms**, *International Conference on Continuous Optimization (ICCOPT)*, TU Berlin, Germany.

May 2019 **Exponential Convergence Time of Gradient Descent for One-Dimensional Deep Linear Neural Networks**, *Mathematics of Deep Learning seminar*, KAUST, KSA.

April 2019 **Stochastic Chambolle-Pock**, *Visual Computing Center showcase*, KAUST, KSA.

March 2019 **Sampling as Convex Optimization**, *Guest Lecture on Optimization for Machine Learning*, KAUST, KSA.

July 2018 **A Splitting Algorithm for Minimization under Stochastic Linear Constraints**, *International Symposium on Mathematical Programming (ISMP)*, Bordeaux, France.

March 2018 **A stochastic Forward Backward algorithm with application to large graphs regularization**, *Machine Learning and Optimization seminar*, Ecole Polytechnique Fédérale de Lausanne, Switzerland.

February 2018 **Snake: a Stochastic Proximal Gradient Algorithm for Regularized Problems over Large Graphs**, *GdR Information, Signal, Image et ViSion (ISIS) meeting*, Telecom Paris, France.

November 2017 **Distributed Douglas Rachford algorithm**, *ANR ODISSEE meeting*, Nice Sophia Antipolis University, France.

September 2017 **Stochastic Proximal Gradient algorithm**, *France / Japan Machine Learning Workshop*, Ecole Normale Supérieure Paris, France.

June 2017 **Snake**, *Conférence sur l'Apprentissage automatique (CAp)*, IMAG Grenoble, France.

December 2016 **A Stochastic Proximal Point Algorithm for Total Variation Regularization over Large Scale Graphs**, *Conference on Decision and Control (CDC)*, Las Vegas, USA.

Teaching and Supervision

2019 **Teaching assistant**, *KAUST*, Thuwal, KSA, 16h.
Optimization for Machine Learning

2019 **Co-supervision of Sélim Chraibi's master's thesis**, *KAUST*, Thuwal, Saudi Arabia.
Title: First order optimization algorithms and compressed optimization algorithms for Federated Learning

2018 **Co-supervision of Sholom Schechtman's master's thesis**, *Telecom Paris*, Paris, France.
Title: Passty Langevin algorithm

2017–2018 **Teaching assistant**, *Telecom Paris*, Paris, France, 32h.
Optimization for Machine Learning. Supervised an Image processing project for industrial master's students

2015–2017 **Teaching assistant**, *ENSAE Paris*, Malakoff, France, 128h.
Algebra, Measure Theory, Introduction to Stochastic Processes, Supervision of Applied statistics project: French presidential elections, Twitter graph and Markov chains

2013–2016 **Volunteer Professor and Member of the Teaching Pole**, *Various nonprofit organizations*, Paris, France, Coached ambitious students from disadvantaged backgrounds to prepare the competitive exams for prestigious French universities. $\sim$ 4 hours per week.
Organizations : Connex'cités, Gics

2005–2008 **Private teacher**, *Private lessons in mathematics and physics*, Paris, France, $\sim$ 1 hour per week.