Avetik Karagulyan

Personal Data

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Work Experience

Since Nov 2021	Postdoctoral fellow at KAUST *Optimization and Machine Learning Lab supervised by Peter Richtárik*
Sept 2018 - May 2021	ENSAE *Teaching Associate of Probability theory, Statistics, Functional analysis, Measure theory and Intro to ML courses*
Apr - Sept 2018	Research intern at ENSAE/CREST *Supervised by Arnak Dalalyan*
Jun - Aug 2017	Innovative Solutions and Technologies Center *Math trainer for high-school students*
Sept 2016 - May 2017	American University of Armenia *Teaching Associate of Probability theory and Statistics courses*

Education

Sept 2023	Higher Education Teaching Certificate Harvards Derek Bok Center for Teaching and Learning *Final grade: 97.5/100*
June 2021	Ph.D. in Applied Mathematics Institut Polytéchnique de Paris, ENSAE, CREST *Supervised by Arnak Dalalyan*
Sept 2018	Master 2 - MVA (Mathematics, Vision, Learning) École normale supérieure Paris-Saclay, Cachan, France *Mention: Très bien*
July 2017	Bachelor in Mathematics Yerevan State University, Yerevan, Armenia *GPA: 20/20*
June 2013	High-school degree PhysMath school after A.Shahinyan, Yerevan, Armenia

PUBLICATIONS

PREPRINT	"MARINA Meets Matrix Stepsizes: Variance Reduced Distributed Non-convex Optimization", Hanmin Li, Avetik Karagulyan and Peter Richtárik | arXiv preprint arXiv:2310.04614
PREPRINT	"Langevin Monte Carlo for Strongly Log-concave Distributions: Randomized Midpoint Revisited", Lu Yu, Avetik Karagulyan and Arnak Dalalyan | arXiv preprint arXiv:2306.08494
PREPRINT	"Det-CGD: Compressed Gradient Descent with Matrix Stepsizes for Non-Convex Optimization", Hanmin Li, Avetik Karagulyan and Peter Richtárik | arXiv preprint arXiv:2305.12568
PREPRINT	"ELF: Federated Langevin Algorithms with Primal, Dual and Bidirectional Compression", Avetik Karagulyan and Peter Richtárik | arXiv preprint arXiv:2303.04622
CONFERENCE	"Convergence of Stein Variational Gradient Descent under a Weaker Smoothness Condition", Lukang Sun, Avetik Karagulyan and Peter Richtárik | In International Conference on Artificial Intelligence and Statistics, pp. 3693-3717. PMLR, 2023.
THESIS	"Sampling with the Langevin Monte-Carlo", Avetik Karagulyan | Ph.D. thesis defended in Institut Polytéchnique de Paris
CONFERENCE	"Penalized Langevin Dynamics with Vanishing Penalty for Smooth and Log-concave targets", Avetik Karagulyan, Arnak Dalalyan | Advances in Neural Information Processing Systems 33 (2020): 17594-17604.
JOURNAL	"Bounding the Error of Discretized Langevin Algorithms for Non-strongly Log-concave Targets", Arnak Dalalyan, Avetik Karagulyan and Lionel Riou-Durand | The Journal of Machine Learning Research 23.1 (2022): 10720-10757.
JOURNAL	"Non-Asymptotic Guarantees For Sampling by Stochastic Gradient Descent", Avetik Karagulyan, Journal of Contemporary Mathematical Analysis (Armenian Academy of Sciences) 54.2 (2019): 71-78
JOURNAL	"User-friendly Guarantees for the Langevin Monte Carlo with Inaccurate Gradient ", Arnak S. Dalalyan, Avetik G. Karagulyan | Stochastic Processes and their Applications 129.12 (2019): 5278-5311.
JOURNAL	"Existence of Positive Solutions for an Approximation of Stationary Mean-Field Games", Diogo Gomes et al. | Involve, a Journal of Mathematics Vol. 10 (2017), No. 3, 473493

Talks and Conferences

POSTER	*Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities* workshop at ICML, Honolulu, Hawaii - July 2023
TALK	Summer School *Statistics and Learning Theory* - July 2023
TALK	3rd conference *Mathematics in Armenia*, Yerevan, Armenia - June 2023
TALK	Mini-symposium *Wasserstein Gradient Flows and Applications* SIAM Optimization23 - May 2023
TALK	Virtual presentation for *Quantitative Methods Area Seminar*, Purdue University - April 2023
TALK	*Rising Stars in AI symposium* - February 2023
INVITED TALK	*Quantitative Methods Area Seminar*, Purdue University - February 2023
POSTER	Summer school in *Statistical Physics and Machine Learning*, Les Houches, France - June 2022
POSTER	*Conference on the Mathematics for Complex Data*, Stockholm, Sweden - June 2022
POSTER	*International Symposium on Non-parametric Statistics*, Pharos, Cyprus - June 2022
TALK	*Journées MAS 2020* - November 2021
TALK	*Ph.D. defense in ENSAE* - June 2021
TALK	*Meeting in Mathematical Statistics* - December 2020
POSTER	*33-rd Neural Information Processing Systems* - December 2020
POSTER	*Joint Structures and Common Foundations of Statistical Physics, Information Geometry, and Inference for Learning (SPIGL20), Les Houches, France - July 2020*
TALK	*Optimization for Machine Learning*, Luminy, France - March 2020
TALK	*Meetings in Mathematical Statistics*, Luminy, France - December 2019
INVITED TALK	*Seminar at Télécom ParisTech*, Paris, France - April 2019
TALK	*8èmes Rencontres des Jeunes Statisticiens (RJS 2019)*, Porquerolles, France - April 2019
POSTER	*YES X: Understanding Deep Learning: Generalization, Approximation, and Optimization*, Eindhoven, Netherlands - March 2019
PARTICIPANT	*3rd Summer school Mathematics and Applications*, Tsaghkadzor, Armenia - 2016 July
PARTICIPANT	*Visiting Student Research Program Applied Differential Equations*, KAUST, Saudi Arabia - 2015 Aug
PARTICIPANT	*2nd Summer school Mathematics and Applications*, Tsaghkadzor, Armenia - 2015 July
PARTICIPANT	*1st Summer school Mathematics and Applications*, Tsaghkadzor, Armenia - 2014 July

Reviewing services

Conferences	AISTATS, NeurIPS, ICML
Journals	Stochastic Processes and their Applications, Bernoulli, Annals of Applied Probabilty, Statistics and Computing, Journal of Machine Learning Research, Electronic Journal of Probability.

Organization

Symposium	Mini-symposium at SIAM OP23 on "Wasserstein gradient flows and applications", co-organized with Anna Korba and Adil Salim
Group seminars	Organized weekly group seminars during the Spring semester of 2023.

Languages

Armenian	Mothertongue
Russian	Full professional
English	Full professional
French	Full professional

Awards and prizes

Silver Medal	IMC 2017 Blagoevgrad, Bulgaria
Bronze Medal	IMC 2016 Blagoevgrad, Bulgaria
Silver Medal	IMC 2015 Blagoevgrad, Bulgaria
Gold Medal	2017, Awarded by Yerevan State University *For high academic performance and participation in olympiads*
Best Student of the Department	2015, Awarded by Yerevan State University
Honourable Mention	IMO 2013 Santa Marta, Colombia
Honourable Mention	IMO 2012 Mar del Plata, Argentina
Semi-finalist	ACM-ICPC 2015 Tbilisi, Georgia
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Semi-finalist	ACM-ICPC 2013 Tbilisi, Georgia
2nd Prize	Mirror of William Lowell Putnam Mathematical Competition 2016
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