

Avetik KARAGULYAN

PERSONAL DATA

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| E-MAIL | auavetik@gmail.com |
| WEBSITE | avetx.github.io |
| PHONE | +966565941461 |
| RESEARCH INTERESTS | Sampling theory, Optimization theory, Statistics |
| TEACHING INTERESTS | Calculus, Linear Algebra, Probability theory, Optimization, Statistics, Sampling theory, Federated Learning |

WORK EXPERIENCE

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| POSTDOC | King Abdullah University of Science and Technology <i>Optimization and Machine Learning Lab supervised by Peter Richtárik</i> Since Nov 2021 |
| TEACHING ASSOCIATE | École nationale de la statistique et de l'administration économique <i>Teaching Associate of Probability theory, Statistics, Functional analysis, Measure theory and Intro to ML courses</i> Sept 2018 - May 2021 |
| RESEARCH INTERN | Center for Research in Economy and Statistics <i>Supervised by Arnak Dalalyan</i> Apr - Sept 2018 |
| MATH TRAINER | Innovative Solutions and Technologies Center <i>Math trainer for high-school students</i> June - Aug 2017 |
| TEACHING ASSOCIATE | American University of Armenia <i>Teaching Associate of Probability theory and Statistics courses</i> Sept 2016 - May 2017 |

EDUCATION

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| PH.D. | Applied Mathematics Institut Polytechnique de Paris <i>Supervised by Arnak Dalalyan</i> June 2021 |
| MASTER | MVA (Mathematics, Vision, Learning) École normale supérieure Paris-Saclay <i>Mention: Très bien</i> Sept 2018 |
| BACHELOR | Mathematics Yerevan State University <i>GPA: 20/20</i> July 2017 |

PUBLICATIONS

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| PREPRINT | "MARINA Meets Matrix Stepsizes: Variance Reduced Distributed Non-convex Optimization", Hanmin Li, Avetik Karagulyan and Peter Richtárik arXiv preprint arXiv:2310.04614 |
| CONFERENCE | "Langevin Monte Carlo for Strongly Log-concave Distributions: Randomized Mid-point Revisited", Lu Yu, Avetik Karagulyan and Arnak Dalalyan Accepted to the International Conference on Learning Representations, 2024 |
| CONFERENCE | "Det-CGD: Compressed Gradient Descent with Matrix Stepsizes for Non-Convex Optimization", Hanmin Li, Avetik Karagulyan and Peter Richtárik Accepted to the International Conference on Learning Representations, 2024 |
| 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 Polytechnique 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

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| INVITED TALK | <i>Research Seminar</i> FGV EMap, Rio de Janeiro, Brazil - October 2023 |
| POSTER | <i>Federated Learning and Analytics in Practice: Algorithms, Systems, Applications, and Opportunities</i> workshop at ICML, Honolulu, Hawaii - July 2023 |
| INVITED TALK | Summer School <i>Statistics and Learning Theory</i> , Tsaghkadzor, Armenia - July 2023 |
| TALK | 3rd conference <i>Mathematics in Armenia</i> , Yerevan, Armenia - June 2023 |
| ORGANIZER/TALK | Mini-symposium <i>Wasserstein Gradient Flows and Applications</i> SIAM OP23, Seattle, USA - May 2023 |
| POSTER | <i>International Conference on Artificial Intelligence and Statistics</i> Valencia, Spain - April 2023 |
| TALK | <i>Rising Stars in AI symposium</i> - February 2023 |

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| INVITED TALK | <i>Quantitative Methods Area Seminar</i> Purdue University - February 2023 |
| POSTER | Summer school in <i>Statistical Physics and Machine Learning</i> Les Houches, France - June 2022 |
| POSTER | <i>Conference on the Mathematics for Complex Data</i> Stockholm, Sweden - June 2022 |
| POSTER | <i>International Symposium on Non-parametric Statistics</i> Pharos, Cyprus - June 2022 |
| TALK | <i>Journées MAS 2020</i> - November 2021 |
| TALK | <i>Ph.D. defense in ENSAE</i> - June 2021 |
| TALK | <i>Virtual Meeting in Mathematical Statistics</i> - December 2020 |
| POSTER | <i>33-rd Neural Information Processing Systems</i> Vancouver, Canada - December 2020 |
| POSTER | <i>Joint Structures and Common Foundations of Statistical Physics</i> <i>Information Geometry, and Inference for Learning (SPIGL20)</i> Les Houches, France - July 2020 |
| TALK | <i>Optimization for Machine Learning</i> , Luminy, France - March 2020 |
| TALK | <i>Meetings in Mathematical Statistics</i> , Luminy, France - December 2019 |
| INVITED TALK | <i>Seminar at Télécom ParisTech</i> , Paris, France - April 2019 |
| TALK | <i>8èmes Rencontres des Jeunes Statisticiens (RJS 2019)</i> Porquerolles, France - April 2019 |
| POSTER | <i>YES X: Understanding Deep Learning: Generalization, Approximation, and Optimization</i> , Eindhoven, Netherlands - March 2019 |
| PARTICIPANT | <i>3rd Summer school Mathematics and Applications</i> Tsaghkadzor, Armenia - 2016 July |
| PARTICIPANT | <i>Visiting Student Research Program Applied Differential Equations</i> KAUST, Saudi Arabia - 2015 Aug |
| PARTICIPANT | <i>2nd Summer school Mathematics and Applications</i> Tsaghkadzor, Armenia - 2015 July |
| PARTICIPANT | <i>1st Summer school Mathematics and Applications</i> Tsaghkadzor, Armenia - 2014 July |

REVIEWING SERVICES

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| CONFERENCES | AISTATS, NeurIPS, ICML |
| JOURNALS | Stochastic Processes and their Applications, Bernoulli, Annals of Applied Probability, Statistics and Computing, Journal of Machine Learning Research, Electronic Journal of Probability. |

ORGANIZATION

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| SYMPOSIUM | Member of the organizing committee of the third "Rising Stars in AI" symposium at KAUST AI Initiative. |
| 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. |

PROFESSIONAL DEVELOPMENT

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| TEACHING | Higher Education Teaching Certificate Harvard's Derek Bok Center for Teaching and Learning <i>Final grade: 97.5/100</i> |
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LANGUAGES

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| ARMENIAN | Native |
| RUSSIAN | Full professional |
| ENGLISH | Full professional |
| FRENCH | Full professional |

AWARDS AND PRIZES

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| SILVER MEDAL | International Mathematical Competition, Bulgaria, 2017 |
| GOLD MEDAL | Awarded by Yerevan State University, 2017 |
| BRONZE MEDAL | International Mathematical Competition, Bulgaria, 2016 |
| 2ND PRIZE | Mirror of William Lowell Putnam Mathematical Competition, 2016 |
| SILVER MEDAL | International Mathematical Competition, Bulgaria, 2017 |
| BEST STUDENT AWARD | Awarded by Yerevan State University, 2016 |
| SEMI-FINALIST | ACM-ICPC, Georgia, 2015 |
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| 2ND PRIZE | Mirror of William Lowell Putnam Mathematical Competition 2013 |
| HONOURABLE MENTION | International Mathematical Olympiad, Colombia, 2013 |
| HONOURABLE MENTION | International Mathematical Olympiad, Argentina, 2012 |