DANIIL DMITRIEV

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daniildmitriev.github.io

EDUCATION

ETH Zurich (PhD at ETH AI Center) from 2021
Working on mathematics in data science, supervised by Prof. Afonso Bandeira and Prof. Fanny Yang

EPFL (Master of Data Science) 2018 to 2021
5.57 out of 6.0 GPA, Computational Neuroscience Minor

Moscow Institute of Physics and Technology (Bachelor of Computer Science) 2014 to 2018
3.77 out of 4.0 GPA

PUBLICATIONS

- **D. Dmitriev,** R. Buhai, S. Tiegel, A. Wolters, G. Novikov, A. Sanyal, D. Steurer, F. Yang, "*Robust mixture learning when outliers overwhelm small groups", under review*, 2024
- **D. Dmitriev,** K. Szabó, A. Sanyal, "*On the Growth of Mistakes in Differentially Private Online Learning: A Lower Bound Perspective",* COLT, 2024
- D. Schröder, **D. Dmitriev,** H. Cui, B. Loureiro, "*Asymptotics of Learning with Deep Structured (Random) Features*", ICML, 2024
- G. Arpino, **D. Dmitriev**, N. Grometto, *"Greedy heuristics and linear relaxations for the random hitting set problem",* APPROX, 2024
- D. Schröder, H. Cui, **D. Dmitriev**, B. Loureiro, "*Deterministic equivalent and error universality of deep random features learning*", ICML, 2023
- **D. Dmitriev**, M. Zhukovskii, "*On monotonicity of Ramanujan function for binomial random variables*", Statistics & Probability Letters, 2021
- T. Lin, S. U. Stich, L. Barba, **D. Dmitriev**, M. Jaggi, "*Dynamic Model Pruning with Feedback*", ICLR, 2020
- **D. Dmitriev**, M. Zhukovskii, "*On a connection of two theoretical graph problems with conjectures of Ramanujan and Samuels*", Russian Mathematical Surveys, 2018

TEACHING

- *ETH Zurich (TA),* Mathematics of Data Science (Fall 2021), Mathematics of Machine Learning (Spring 2022)
- *EPFL (TA)*, Artificial Neural Networks (Spring 2020, Spring 2021)

WORK EXPERIENCE

- **Bloomberg L.P.** Research AI Intern in News Intelligence team *London,* Sep 2020 – Jan 2021
  Applying the diversification methods to improve the output of the recommendation system. Created pipeline for the experiments and compared the common diversification approaches (MMR, DPP) across multiple metrics.
- **EPFL** Research Scholar Student in Machine Learning and Optimization lab *Lausanne,* Sep 2018 – Aug 2020
  Worked on neural networks compression (model pruning, model quantization, gradient compression). Was involved in developing models in PyTorch, implementing and analysing pruning methods both during and before training.
- **Amazon** Software Engineering Intern in Computer Vision team *Berlin,* Jul 2018 – Sep 2018
  Implemented image captioning in Python, MXNet. Used reinforcement learning to optimize non-differentiable objectives for evaluating quality of the caption. Showed the advantage compared to differentiable loss-functions.
- **Google** Software Engineering Intern in Key Visualizer team *New York City,* Jul 2017 – Oct 2017
  Used clustering and time series analysis (DBSCAN, Granger Causality) in Python and Java to find dependencies in complex multivariate temporal data.

SKILLS

- Strong knowledge of machine learning in Python (numpy, scikitlearn) and deep learning frameworks (PyTorch, TensorFlow)
- Good theoretical understanding of algorihtms and discrete mathematics (primary research area)
- Experience with computer vision and natural language processing task Strong knowledge of machine learning in Python (numpy, scikitlearn) and deep learning frameworks (PyTorch, TensorFlow)
- Doing research about interplay between privacy, robustness and fairness of the algorithms
- Applying tools from random matrix theory for the study of deep learning algorithms

STUDENT PROJECTS

- *Empirical Study of Gradient-Based Optimization Methods in High-Dimensional Regime,* Master Project, 2021, supervised by *Dr. Federica Gerace* and *Prof. Lenka Zdeborová*
  Investigated gradient descent and variants of SGD for the phase retrieval (regression) and symmetric door (classification) prototypical problems. Following the teacher-student framework looked into simple and overparametrized settings and showed the effect of momentum.
- *Topological Perspective of Brain Development*, 2020, supervised by *Dr. Lida Kanari* and *Prof. Kathryn Hess Bellwald*
  Applied tools from the Topological Data Analysis, such as Persistence Diagrams, to compare multiple in silico and in vivo datasets of the mice astrocyte cells. Proposed a way to combine spacial and structural properties of the cells.