DANIIL DMITRIEV

Schärenmoosstrasse 18, 8052 Zürich, Switzerland dmitrievdaniil97@gmail.com

daniildmitriev.github.io

EDUCATION

ETH Zurich (PhD at ETH AI Center) from 2021
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

MIPT (Bachelor of Computer Science) 2014 to 2018
3.77 out of 4.0 GPA

PUBLICATIONS

- **DD*,** R. Buhai*, S. Tiegel, A. Wolters, G. Novikov, A. Sanyal, D. Steurer, F. Yang, *"Robust mixture learning when outliers overwhelm small groups", NeurIPS*, 2024
- **DD,** K. Szabó, A. Sanyal, *"On the growth of mistakes in differentially private online learning: a lower bound perspective",* COLT, 2024
- D. Schröder*, **DD*,** H. Cui*, B. Loureiro, "*Asymptotics of learning with deep structured (random) features*", ICML, 2024
- G. Arpino, **DD**, N. Grometto, *"Greedy heuristics and linear relaxations for the random hitting set problem",* APPROX, 2024 (*alphabetical order*)
- D. Schröder, H. Cui, **DD**, B. Loureiro, "*Deterministic equivalent and error universality of deep random features learning*", ICML, 2023
- **DD**, M. Zhukovskii, "*On monotonicity of Ramanujan function for binomial random variables*", Statistics & Probability Letters, 2021 (*alphabetical order*)
- T. Lin, S. U. Stich, L. Barba, **DD**, M. Jaggi, "*Dynamic model pruning with feedback*", ICLR, 2020
- **DD**, 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)
- Supervising MSc theses at ETH Zurich: Carolin Heinzler (Fall 2023), Krish Agrawal, Ulysse Faure (Spring 2024)

SERVICE

- Reviewer at NeurIPS, ICLR, AISTATS

WORK & RESEARCH EXPERIENCE

- **Bloomberg L.P.** Research AI Intern in News Intelligence team *London,* Sep 2020 – Jan 2021
  Applied 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 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 algorithms 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)
- Research experience in the fields of privacy, robustness and fairness of the algorithms
- Random matrix theory tools 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.