

# DANIIL DMITRIEV

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[daniildmitriev.github.io](https://daniildmitriev.github.io)

## EDUCATION

**PhD student**, Department of Mathematics and ETH AI Center  
advised by Prof. Afonso Bandeira and Prof. Fanny Yang

**ETH Zurich**

2021 to 2025 (expected)

**Master's** of Data Science  
GPA: 5.57 out of 6.0

**EPFL**

2018 to 2021

**Bachelor's** of Applied Mathematics and Computer Science  
GPA: 3.77 out of 4.0

**MIPT**

2014 to 2018

## 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 (alphabetical order)

## TALKS

- Arizona State University, reading group, 2024: Robust mixture learning when outliers overwhelm small groups
- University of Pennsylvania, reading group, 2024: Robust mixture learning when outliers overwhelm small groups
- ETH Zurich, DACO seminar, 2024: Robust mixture learning when outliers overwhelm small groups
- ICTP, Trieste, Youth in High Dimensions, 2024: Robust mixture learning when outliers overwhelm small groups
- University of Copenhagen, DeLTA seminar, 2024: Lower bounds for online private learning
- ETH Zurich, Graduate seminar in probability, 2023: On integrality gaps for the random hitting set problem
- Les Diablerets, Workshop on spin glasses, 2022: Integrality gaps for vertex covers on sparse Bernoulli hypergraphs

## 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)
- Teaching at Berkeley Math Circle (Fall 2024)

## SERVICE

- Reviewer at NeurIPS 2024 (Top reviewer), ICLR 2025
- Organizer of Theory breakfast at ETH Zurich (Spring 2024)

## WORK & RESEARCH EXPERIENCE

- **UC Berkeley** Simons Institute for the Theory of Computing *Berkeley, Oct 2024 – Dec 2024*  
Visiting graduate student in the program “Modern paradigms in generalization”
- **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.

## 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.