

Dmitrii Avdiukhin

Curriculum Vitae

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📁 [dyukha.github.io](https://github.com/dyukha)

Research interests

Projected gradient descent, Balanced graph partitioning, Distributed algorithms.

Previous areas: Submodular Optimization, syntax/static analysis, model generation, model checking.

Education

2017–current **Ph.D.**, *Indiana University*, Bloomington, IN.

Advisor: Grigory Yaroslavtsev (<http://grigory.us>)

2008–2013 **Specialist (5 years) Degree**, *Saint Petersburg State University*, GPA 4.9/5.0.

Diploma with distinction. Thesis title: “Translation definition language for information system reengineering tools”. Advisor: Iakov Kirilenko (https://www.researchgate.net/profile/Iakov_Kirilenko)

Experience

Summer 2022 **Research Intern**, *Amazon*.

Demonstration selection for few-shot learning for small language models.

Mentor: Ashish Khetan (<https://scholar.google.com/citations?user=AaaauqDAAAAAJ>)

Summer 2020 **Research Intern**, *Amazon*.

Federated Learning under weak assumptions.

Mentor: Shiva Kasiviswanathan (<http://www.shivakasiviswanathan.com>)

Summer 2019 **Research Intern**, *Amazon*, New York.

Improving accuracy and performance of graph convolutional networks.

Mentor: Zohar Karnin (<https://sites.google.com/site/zoharkarnin>)

Summer 2018 **Software Engineer**, *Pro Unlimited @ Facebook*, Menlo Park.

Implementing balanced graph partitioning algorithm.

Mentor: Sergey Pupyrev (<https://spupyrev.github.io>)

2016–2017 **Researcher**, *ITMO University*, Saint Petersburg.

Model generation from execution traces

2013–2016 **Software Engineer**, *JetBrains*, Saint Petersburg.

SQL dialect support

2012–2013 **Software Engineer**, *Lanit Tercom*, Saint Petersburg.

Participating in project of migration a system from SQL Server to Oracle

Publications

Authors are listed in alphabetical order unless marked with *

- AAAI 2023 **D. Avdiukhin** and G. Yaroslavtsev. "HOUDINI: Escaping from Moderately Constrained Saddles", 37th AAAI Conference on Artificial Intelligence. (under review)
- AAAI 2023 **D. Avdiukhin**, S. Das, O. Fischer, F. Mirza, D. Vainstein and G. Yaroslavtsev. "Tree Learning: Optimal Algorithms and Sample Complexity", 37th AAAI Conference on Artificial Intelligence. (under review)
- AAAI 2023 * P. Mani, C. Domeniconi, **D. Avdiukhin** and G. Yaroslavtsev. "Hub-VAE: Unsupervised Hub-based Regularization of Variational Autoencoders", 37th AAAI Conference on Artificial Intelligence. (under review)
- NeurIPS 2021 **D. Avdiukhin** and G. Yaroslavtsev. "Escaping Saddle Points with Compressed SGD", 35th Conference on Neural Information Processing Systems
- ICML 2021 **D. Avdiukhin** and S. Kasiviswanathan. "Federated Learning under Arbitrary Communication Patterns", 38th International Conference on Machine Learning
- AAAI 2021 * S. Naumov, **D. Avdiukhin**, and G. Yaroslavtsev. "Objective-Based Hierarchical Clustering of Deep Embedding Vectors", 35th AAAI Conference on Artificial Intelligence
- OPT 2020 **D. Avdiukhin**, and G. Yaroslavtsev. "Escaping Saddle Points with Compressed SGD", 12th OPT Workshop on Optimization for Machine Learning.
- AISTATS 2020 * G. Yaroslavtsev, S. Zhou, and **D. Avdiukhin**. "'Bring Your Own Greedy'+Max: Near-Optimal 1/2-Approximations for Submodular Knapsack", 23rd International Conference on Artificial Intelligence and Statistics. <https://arxiv.org/pdf/1910.05646.pdf>
- OPT 2019 **D. Avdiukhin**, C. Jin and G. Yaroslavtsev. "Escaping Saddle Points with Inequality Constraints via Noisy Sticky Projected Gradient Descent", 11th OPT Workshop on Optimization for Machine Learning, **Oral + poster**. https://opt-ml.org/papers/2019/paper_30.pdf
- VLDB 2019 **D. Avdiukhin**, S. Pupyrev and G. Yaroslavtsev. "Multi-Dimensional Balanced Graph Partitioning via Projected Gradient Descent", 45th International Conference on Very Large Data Bases, Research Track. <https://arxiv.org/pdf/1902.03522.pdf>
- KDD 2019 **D. Avdiukhin**, S. Mitrovic, G. Yaroslavtsev and S. Zhou "Adversarially Robust Submodular Maximization under Knapsack Constraints". **Oral presentation**, 9.2% acceptance rate. <https://arxiv.org/pdf/1905.02367.pdf>
- INDIN 2017 **D. Avdiukhin**, D. Chivilikhin, G. Korneev, V. Ulyantsev and A. Shalyto. "Plant trace generation for formal plant model inference: methods and case study", 15th IEEE International Conference on Industrial Informatics
- PSI 2015 E. Verbitskaia, S. Grigorev and **D. Avdyukhin**. "Relaxed Parsing of Regular Approximations of String-Embedded Languages", 10th International Andrei Ershov Memorial Conference on Perspectives of System Informatics

Talks

VLDB 2019 “Multi-Dimensional Balanced Graph Partitioning via Projected Gradient Descent”
KDD 2019 “Adversarially Robust Submodular Maximization under Knapsack Constraints”

Invited Talks

Dec 2019 **Yandex, Moscow, Russia.** “Multi-Dimensional Balanced Graph Partitioning via Projected Gradient Descent”

Honors

2019 Nominated for Microsoft Research Fellowship by the Indiana University Computer Science Department (1 out of 2 per department)
2019 Nominated for Google PhD Fellowship Program by the Indiana University Computer Science Department

Teaching Experience

Fall 2022 “**Introduction to Algorithm Design and Analysis**” (**undergraduate**). Indiana University, Bloomington, CSCI-B403. Associate Instructor.
Spring 2022 “**Math & logic for cognitive science**” (**graduate**). Indiana University, Bloomington, CSCI-B590. Associate Instructor.
Spring 2020 “**Applied Algorithms**” (**graduate**). Indiana University, Bloomington, CSCI-B505. Head Associate Instructor.
Spring 2019 “**Data Structures**” (**Honors, undergraduate**). Indiana University, Bloomington, CSCI-H343. Associate Instructor.

Competitive programming

ACM ICPC Latest result: 19th place on world semi-final, 2014 (neerc.ifmo.ru/archive/2014/standings.html)
Codeforces Rating: 2135 (codeforces.com/profile/dyukha)
Topcoder Rating: 1784 (www.topcoder.com/members/dyukha)

Skills

ML PyTorch
Frameworks
Languages Python, Kotlin, C#, Java, Python, C++, various SQL dialects
VCS git, Mercurial, SVN
English TOEFL: 100, Upper-Intermediate