Dmitrii Avdiukhin

Curriculum Vitae

✉ *dimonbv@gmail.com*
dyukha.github.io

Research interests

Projected gradient descent, Balanced graph partitioning, Distributed algorithms, Submodular Optimization.
Previous areas: 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 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 $\star$

NeurIPS 2021 (under review) $\star$ **D. Avdiukhin**, N. Ivkin, S. U. Stich and V. Braverman. "Bidirectional Adaptive Communication for Heterogeneous Distributed Learning", 35th Conference on Neural Information Processing Systems.

NeurIPS 2021 (under review) **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 **D. Avdiukhin**, S. Naumov, 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

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

Languages Kotlin, C#, Java, Python, C++, various SQL dialects

VCS git, Mercurial, SVN

English TOEFL: 100, Upper-Intermediate