Alexander Tyurin

Curriculum Vitae

Education

2017–2020 **PhD in Computer Science**, *Higher School of Economics*, Moscow, Faculty of Computer Science.
PhD thesis: Development of a method for solving structural optimization problems
Supervisor: Alexander Gasnikov
Committee: Yurii Nesterov, Anatoli Juditsky, Boris Mordukhovich, Katya Scheinberg, Alexander Nazin

2015–2017 **Masters of Computer Science**, *Higher School of Economics*, Moscow, Faculty of Computer Science, *GPA – 9.84 / 10*.
Master's programme 'Mathematical Methods of Optimization and Stochastics'

2011–2015 **Bachelor of Computer Science**, *Lomonosov Moscow State University*, Moscow, Faculty of Computational Mathematics and Cybernetics, *GPA – 4.97 / 5*.

Work experience

2021–present **Postdoctoral fellow**, KAUST, Visual Computing Center, Saudi Arabia.

2018–2021 **Research and development engineer**, Yandex Self-Driving Cars, Moscow.
Using lidar (3D point clouds) and cameras (images) sensors, we develop real-time algorithms for dynamic and static objects detection in a perception team for self-driving cars. Primary responsibilities: from creating datasets and research (Python, SQL, MapReduce) to implementation of proposed algorithms (C++).

2018–2021 **Junior research fellow**, Higher School of Economics, Moscow, Part time.
Working on PhD thesis that is based on 8 publications in Scopus indexed journals.

2017–2020 **Teaching assistant**, Higher School of Economics, Moscow.
Course: Continuous Optimization. Responsibilities: conduct seminars, preparing theoretical and practical homeworks.

2018 **Research engineer**, Alterra.ai, Moscow.
Developed NLP assistant algorithms for generic business tasks.

2015–2018 **Research engineer**, VisionLabs, Moscow.
Developed a face recognition algorithm that showed **top 2** result in an international competition FRVT NIST. Primary responsibilities: metric learning with CNN backbone, preparing a large scale face recognition dataset.

Computer skills

Python, C++, LaTeX, Matlab, SQL, MapReduce, Git, ...

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Languages

Russian **Native**

English **Advanced**

Publications

- *Fatkhullin I., Tyurin A., Richtárik P.* Momentum Provably Improves Error Feedback! // In Advances in Neural Information Processing Systems 36 (NeurIPS 2023)
- *Tyurin A., Richtárik P.* Optimal Time Complexities of Parallel Stochastic Optimization Methods Under a Fixed Computation Model // In Advances in Neural Information Processing Systems 36 (NeurIPS 2023)
- *Tyurin A., Richtárik P.* 2Direction: Theoretically Faster Distributed Training with Bidirectional Communication Compression // In Advances in Neural Information Processing Systems 36 (NeurIPS 2023)
- *Gruntkowska K., Tyurin A., Richtárik P.* EF21-P and Friends: Improved Theoretical Communication Complexity for Distributed Optimization with Bidirectional Compression // In International Conference on Machine Learning. 2023. (ICML 2023)
- *Tyurin A., Sun L., Burlachenko K., Richtárik P.* Sharper Rates and Flexible Framework for Nonconvex SGD with Client and Data Sampling // arXiv preprint arXiv:2206.02275
- *Tyurin A., Richtárik P.* A Computation and Communication Efficient Method for Distributed Nonconvex Problems in the Partial Participation Setting // In Advances in Neural Information Processing Systems 36 (NeurIPS 2023)
- *Tyurin A., Richtárik P.* DASHA: Distributed nonconvex optimization with communication compression, optimal oracle complexity, and no client synchronization // In International Conference on Learning Representations. 2023. (ICLR 2023) (notable-top-25%)
- *Szlendak R., Tyurin A., Richtárik P.* Permutation Compressors for Provably Faster Distributed Nonconvex Optimization // In International Conference on Learning Representations. 2022. (ICLR 2022)
- *Ivanova A., Dvurechensky P., Vorontsova E., Pasechnyuk D., Gasnikov A., Dvinskikh D., Tyurin A.* Oracle complexity separation in convex optimization // Journal of Optimization Theory and Applications. 2022.
- *Stonyakin F., Tyurin A., Gasnikov A., Dvurechensky P., Agafonov A., Dvinskikh D., Alkousa M., Pasechnyuk D., Artamonov S., Piskunova V.* Inexact model: a framework for optimization and variational inequalities // Optimization Methods and Software. 2021. P. 1–47.
- *Dvurechensky P., Gasnikov A., Omelchenko A., Tyurin A.* A stable alternative to Sinkhorn's algorithm for regularized optimal transport // Lecture Notes in Computer Science. 2020. V. 12095. P. 406–423.
- *Dvinskikh D., Omelchenko A., Gasnikov A., Tyurin A.* Accelerated gradient sliding for minimizing the sum of functions // Doklady Mathematics. 2020. V. 101. N. 3. P. 244–246.
- *Tyurin A.* Primal–dual fast gradient method with a model // Computer Research and Modeling. 2020. V. 12, N. 2. P. 263–274. (in russian)
- *Dvinskikh D., Tyurin A., Gasnikov A., Omelchenko S.* Accelerated and nonaccelerated stochastic gradient descent with model conception // Mathematical Notes. 2020. V. 108. N. 4. P. 511–522 (main co-author).
- *Gasnikov A., Tyurin A.* Fast gradient descent for convex minimization problems with an oracle producing a (δ, L)-model of function at the requested point // Computational Mathematics and

Mathematical Physics. 2019. V. 59. N. 7. P. 1085–1097. (main co-author; alphabetical order).

- *Stonyakin F., Dvinskikh D., Dvurechensky P., Kroshnin A., Kuznetsova O., Agafonov A., Gasnikov A., Tyurin A., Uribe C., Pasechnyuk D., Artamonov S.* Gradient methods for problems with inexact model of the objective // Lecture Notes in Computer Science. 2019. V. 11548. P. 97–114.
- *Ogaltsov A., Tyurin A.* A heuristic adaptive fast gradient method in stochastic optimization problems // Computational Mathematics and Mathematical Physics. 2019. V. 60. N. 7. P. 1108–1115 (main co-author, alphabetical order).
- *Anikin A., Gasnikov A., Dvurechensky P., Tyurin A., Chernov A.* Dual approaches to the minimization of strongly convex functionals with a simple structure under affine constraints // Computational Mathematics and Mathematical Physics. 2017. V. 57. N. 8. P. 1262–1276.