Dmitrii Pasechniuk

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Employment History

Mar 2022 – Jul 2025 — **Research Assistant.** Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, United Arab Emirates.

Education

Aug 2025 – Present — **Ph.D. candidate in Machine Learning**, Mohamed bin Zayed University of Artificial Intelligence, Abu Dhabi, United Arab Emirates.

Sep 2023 – Aug 2025 — **B.Sc. in Mathematics**, Université Grenoble Alpes, Grenoble, France.

Oct 2022 – Jun 2023 — **Undergraduate studies in Mathematics and Computer Science**, Neapolis University Pafos, Paphos, Cyprus.

Sep 2020 – Jun 2021 — **Undergraduate studies in Mathematics and Physics**, Moscow Institute of Physics and Technology, Moscow, Russia.

Research Publications

Articles

1. D. Pasechnyuk-Vilensky and M. Takáč, *Chebyshev-exact acceleration under hessian variation, i: Sine-jacobi method*, 2026. URL: https://arxiv.org/abs/2606.16671.
2. D. Pasechnyuk-Vilensky and M. Takáč, *Heterogeneous-horizon exact-weight local sgd*, 2026. URL: http://arxiv.org/abs/2604.24463.
3. D. Pasechnyuk-Vilensky and M. Takáč, *Order-sensitive sequential interventions on ideal lattices*, 2026. URL: https://arxiv.org/abs/2604.26472.
4. D. Kamzolov, A. Agafonov, D. Pasechnyuk, A. Gasnikov, and M. Takáč, "Optami: Global superlinear convergence of high-order methods," in *The Thirteenth International Conference on Learning Representations*, 2025. URL: https://openreview.net/forum?id=Cpr6Wv2tfr.
5. D. Pasechniuk, P. Dvurechensky, C. A. Uribe, and A. Gasnikov, "Decentralised convex optimisation with probability-proportional-to-size quantization," *EURO Journal on Computational Optimization*, no. 13, p. 100 113, 2025. DOI: https://doi.org/10.1016/j.ejco.2025.100113.
6. D. Pasechnyuk-Vilensky, D. Kamzolov, and M. Takáč, *Cubic regularized newton method with variance reduction for finite-sum non-convex problems*, 2025. URL: http://arxiv.org/abs/2510.08714.
7. D. Pasechnyuk-Vilensky and M. Takáč, *Ethic duality: A homological framework for primal-dual problems*, 2025. URL: http://arxiv.org/abs/2512.17170.
8. D. Pasechnyuk-Vilensky and M. Takáč, *Learning latent graph geometry via fixed-point schrödinger-type activation: A theoretical study*, 2025. URL: http://arxiv.org/abs/2507.20088.
9. D. Pasechnyuk-Vilensky and M. Takáč, *Moduli space of optimization algorithms*, 2025. URL: http://arxiv.org/abs/2511.18004.
10. O. Savchuk et al., "Accelerated bregman gradient methods for relatively smooth and relatively lipschitz continuous minimization problems," *Russian Mathematical Surveys*, vol. 80, no. 6, pp. 137–172, 2025. DOI: https://doi.org/10.4213/rm10274.

11 K. Brilliantov, F. Pavutnitskiy, D. Pasechnyuk, and G. Magai, "Applying language models to algebraic topology: Generating simplicial cycles using multi-labeling in wu's formula," in *International Conference on Machine Learning*, PMLR, 2024, pp. 4542–4560. URL: https://proceedings.mlr.press/v235/brilliantov24a.html.

12 M. Kubentayeva et al., "Primal-dual gradient methods for searching network equilibria in combined models with nested choice structure and capacity constraints," *Computational Management Science*, vol. 21, no. 1, p. 15, 2024. DOI: https://doi.org/10.1007/s10287-023-00494-8.

13 S. S. Ablaev, F. S. Stonyakin, M. S. Alkousa, and D. Pasechnyk, "Adaptive methods for variational inequalities with relatively smooth and reletively strongly monotone operators," *Programming and Computer Software*, vol. 49, no. 6, pp. 485–492, 2023. DOI: https://doi.org/10.1134/S0361768823060026.

14 G. Aivazian, F. S. Stonyakin, D. Pasechnyk, M. S. Alkousa, A. Raigorodsky, and I. Baran, "Adaptive variant of the frank–wolfe algorithm for convex optimization problems," *Programming and Computer Software*, vol. 49, no. 6, pp. 493–504, 2023. DOI: https://doi.org/10.1134/S0361768823060038.

15 A. N. Beznosikov, A. V. Gasnikov, K. E. Zainullina, A. Y. Maslovskii, and D. A. Pasechnyuk, "A unified analysis of variational inequality methods: Variance reduction, sampling, quantization, and coordinate descent," *Computational Mathematics and Mathematical Physics*, vol. 63, no. 2, pp. 147–174, 2023. DOI: https://doi.org/10.1134/S0965542523020045.

16 E. Gladin, I. Kuruzov, F. Stonyakin, D. Pasechnyuk, M. Alkousa, and A. Gasnikov, "Solving strongly convex-concave composite saddle point problems with a small dimension of one of the variables," *Matematicheskii Sbornik*, vol. 214, no. 3, pp. 3–53, 2023. DOI: https://doi.org/10.4213/sm9700.

17 D. Pasechnyuk, A. Gasnikov, and M. Takáč, *Stochastic gradient descent with linear averaged preconditioning*, 2023. URL: https://arxiv.org/abs/2308.14192.

18 D. Pasechnyuk, I. Pavlov, M. Takáč, and A. Gasnikov, *Information-theoretic upper bounds for deterministic noise in zeroth-order convex optimization*, 2023. URL: https://arxiv.org/abs/2306.16371.

19 D. Pasechnyuk, A. Prazdnichnykh, M. Evtikhiev, and T. Bryksin, "Judging adam: Studying the performance of optimization methods on ml4se tasks," in *2023 IEEE/ACM 45th International Conference on Software Engineering: New Ideas and Emerging Results (ICSE-NIER)*, IEEE, 2023, pp. 117–122. DOI: https://doi.org/10.1109/ICSE-NIER58687.2023.00027.

20 D. A. Pasechnyuk and A. Gornov, "A randomised non-descent method for global optimisation," in *International Conference on Optimization and Applications*, Springer, 2023, pp. 3–14. DOI: https://doi.org/10.1007/978-3-031-48751-4_1.

21 D. A. Pasechnyuk, M. Persiianov, P. Dvurechensky, and A. Gasnikov, "Algorithms for euclidean-regularised optimal transport," in *International Conference on Optimization and Applications*, Springer, 2023, pp. 84–98. DOI: https://doi.org/10.1007/978-3-031-47859-8_7.

22 A. Alpatov, E. Peters, D. Pasechnyuk, A. Raigorodsky, et al., "Stochastic optimization in digital pre-distortion of the signal," *Computer research and modeling*, vol. 14, no. 2, pp. 399–416, 2022. DOI: http://doi.org/10.20537/2076-7633-2022-14-2-399-416.

23 S. Hanzely, D. Kamzolov, D. Pasechnyuk, A. Gasnikov, P. Richtárik, and M. Takác, "A damped newton method achieves global $\mathcal{O}(1/k^2)$ and local quadratic convergence rate," *Advances in Neural Information Processing Systems*, vol. 35, pp. 25 320–25 334, 2022. URL: https://proceedings.neurips.cc/paper_files/paper/2022/hash/a1f0c0cd6caaa4863af5f12608edf63e-Abstract-Conference.html.

24 A. Ivanova et al., "Oracle complexity separation in convex optimization," *Journal of Optimization Theory and Applications*, vol. 193, no. 1, pp. 462–490, 2022. DOI: https://doi.org/10.1007/s10957-022-02038-7.

25 D. Pasechnyuk, A. Anikin, and V. Matyukhin, "Accelerated proximal envelopes: Application to the coordinate descent method," *Computational Mathematics and Mathematical Physics*, vol. 62, no. 2, pp. 342–352, 2022. DOI: https://doi.org/10.1134/S0965542522020038.

26 D. Pasechnyuk, A. Gasnikov, and M. Takáč, "Effects of momentum scaling for sgd," in *NeurIPS Workshop HOO*, 2022. URL: https://order-up-ml.github.io/papers/17.pdf.

27 A. V. Gasnikov et al., "Accelerated meta-algorithm for convex optimization problems," *Computational Mathematics and Mathematical Physics*, vol. 61, no. 1, pp. 17–28, 2021. DOI: https://doi.org/10.1134/S096554252101005X.

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30 A. Maslovskiy et al., "Non-convex optimization in digital pre-distortion of the signal," in *International Conference on Mathematical Optimization Theory and Operations Research*, Springer, 2021, pp. 54–70. DOI: https://doi.org/10.1007/978-3-030-86433-0_4.

31 D. Pasechnyuk, P. Dvurechensky, S. Omelchenko, and A. Gasnikov, "Stochastic optimization for dynamic pricing," in *International Conference on Optimization and Applications*, Springer, 2021, pp. 82–94. DOI: https://doi.org/10.1007/978-3-030-92711-0_6.

32 D. Pasechnyuk and V. Matyukhin, "On the computational efficiency of catalyst accelerated coordinate descent," in *International Conference on Mathematical Optimization Theory and Operations Research*, Springer, 2021, pp. 176–191. DOI: https://www.doi.org/10.1007/978-3-030-77876-7_12.

33 D. Pasechnyuk and A. M. Raigorodskii, "Network utility maximization by updating individual transmission rates," in *International Conference on Optimization and Applications*, Springer, 2021, pp. 184–198. DOI: https://doi.org/10.1007/978-3-030-92711-0_13.

34 F. Stonyakin et al., "Inexact model: A framework for optimization and variational inequalities," *Optimization Methods and Software*, vol. 36, no. 6, pp. 1155–1201, 2021. DOI: https://doi.org/10.1080/10556788.2021.1924714.

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36 D. Pasechnyuk, F. Stonyakin, et al., "One method for minimization a convex lipschitz-continuous function of two variables on a fixed square," *Computer research and modeling*, vol. 11, no. 3, pp. 379–395, 2019. DOI: http://doi.org/10.20537/2076-7633-2019-11-3-379-395.

37 D. Pasechnyuk, "Scheduling strategies for resource allocation in a cellular base station," *Proceedings of MIPT*, vol. 11, no. 2, pp. 38–48, 2019. URL: https://mipt.ru/upload/medialibrary/f16/4_trudy-mfti-_2_42_38_48.pdf.

38 F. S. Stonyakin et al., "Gradient methods for problems with inexact model of the objective," in *International Conference on Mathematical Optimization Theory and Operations Research*, Springer, 2019, pp. 97–114. DOI: https://doi.org/10.1007/978-3-030-22629-9_8.

Skills

Languages	Russian, English, French
Coding	SystemVerilog, Assembler, C++, Java, Python, MATLAB, Haskell, Coq