

Yura Malitsky

Curriculum Vitae

Department of Mathematics
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Job experience

- 01.10.2020–current **Assistant professor**, *Linköping University*, Department of Mathematics.
- 2019–present **Postdoc researcher**, *EPFL*, Laboratory for Information and Inference Systems, Group of Prof. Volkan Cevher.
- 2017–2019 **Postdoc researcher**, *University of Göttingen*, Institute for Numerical and Applied Mathematics, Group of Prof. Russell D. Luke.
- 2015–2016 **Postdoc researcher**, *Graz University of Technology*, Institute for Computer Graphics and Vision, Group of Prof. Thomas Pock.

Education

- 2012–2015 **PhD student**, *Taras Shevchenko University of Kyiv*, Faculty of Cybernetics, Applied Mathematics.
- 2010–2012 **MSc**, *Taras Shevchenko University of Kyiv*, Faculty of Cybernetics, Applied Mathematics.
- 2006–2010 **BSc**, *Taras Shevchenko University of Kyiv*, Faculty of Cybernetics, Applied Mathematics.

PhD thesis

- title *Effective projection methods for variational inequalities and composite optimization problems.*
- supervisor Prof. Volodymyr V. Semenov
- description The dissertation was dedicated to the development of new algorithms for monotone variational inequalities and composite minimization problems.

Fields of interests

- Mathematical optimization
- Nonlinear analysis
- Machine learning
- Variational analysis

Awards

- 2015 SIAM Student Paper Award for “Projected reflected gradient method for monotone variational inequalities” (SIAM J. Optimization 25, 2015)

Scholarships and grants

- 2006-2015 Government scholarship
- 2010-2011 Victor Pinchuk Foundation Fellow

- [1] A. Alacaoglu and Y. Malitsky. Stochastic variance reduction for variational inequality methods. 2021. arXiv: [2102.08352](#).
- [2] A. Alacaoglu, Y. Malitsky, and V. Cevher. Convergence of adaptive algorithms for weakly convex constrained optimization. 2020. arXiv: [2006.06650](#).
- [3] A. Alacaoglu, Y. Malitsky, P. Mertikopoulos, and V. Cevher. A new regret analysis for Adam-type algorithms. In *International Conference on Machine Learning*, 2020. arXiv: [2003.09729](#). URL: <http://proceedings.mlr.press/v119/alacaoglu20b.html>.
- [4] Y. Malitsky. Golden ratio algorithms for variational inequalities. *Mathematical Programming*, 184:383–410, 2020. DOI: [10.1007/s10107-019-01416-w](#). arXiv: [1803.08832](#).
- [5] Y. Malitsky and K. Mishchenko. Adaptive gradient descent without descent. In *International Conference on Machine Learning*, 2020. arXiv: [1910.09529](#). URL: <http://proceedings.mlr.press/v119/malitsky20a.html>.
- [6] Y. Malitsky and M. K. Tam. A forward-backward splitting method for monotone inclusions without cocoercivity. *SIAM Journal on Optimization*, 30(2):1451–1472, 2020. DOI: [10.1137/18M1207260](#). arXiv: [1808.04162](#).
- [7] K. Mishchenko, D. Kovalev, E. Shulgin, P. Richtárik, and Y. Malitsky. Revisiting stochastic extragradient. In *International Conference on Artificial Intelligence and Statistics*, 2020. arXiv: [1905.11373](#). URL: <http://proceedings.mlr.press/v108/mishchenko20a.html>.
- [8] E. R. Csetnek, Y. Malitsky, and M. K. Tam. Shadow Douglas-Rachford splitting for monotone inclusions. *Applied Mathematics & Optimization*, 80(3):665–678, 2019. DOI: [10.1007/s00245-019-09597-8](#). arXiv: [1903.03393](#).
- [9] Y. Malitsky and P. Ochs. Model function based conditional gradient method with Armijo-like line search. In *International Conference on Machine Learning*, pages 4891–4900, 2019. arXiv: [1901.08087](#). URL: <http://proceedings.mlr.press/v97/ochs19a/ochs19a.pdf>.
- [10] D. R. Luke and Y. Malitsky. Block-coordinate primal-dual method for nonsmooth minimization over linear constraints. In *Large-Scale and Distributed Optimization*, pages 121–147. Springer, Cham, 2018. DOI: [10.1007/978-3-319-97478-1_6](#). arXiv: [1801.04782](#).
- [11] Y. Malitsky. Proximal extrapolated gradient methods for variational inequalities. *Optimization Methods and Software*, 33(1):140–164, 2018. DOI: [10.1080/10556788.2017.1300899](#). arXiv: [1601.04001](#).
- [12] Y. Malitsky and T. Pock. A first-order primal-dual algorithm with linesearch. *SIAM Journal on Optimization*, 28(1):411–432, 2018. DOI: [10.1137/16M1092015](#). arXiv: [1608.08883](#).
- [13] Y. Malitsky. The primal-dual hybrid gradient method reduces to a primal method for linearly constrained optimization problems. 2017. arXiv: [1706.02602](#).
- [14] Y. Malitsky. Projected reflected gradient methods for monotone variational inequalities. *SIAM Journal on Optimization*, 25(1):502–520, 2015. DOI: [10.1137/14097238X](#). arXiv: [1502.04968](#).
- [15] Y. V. Malitsky and V. Semenov. A hybrid method without extrapolation step for solving variational inequality problems. *Journal of Global Optimization*, 61(1):193–202, 2015. DOI: [10.1007/s10898-014-0150-x](#). arXiv: [1501.07298](#).
- [16] Y. V. Malitsky and V. Semenov. An extragradient algorithm for monotone variational inequalities. *Cybernetics and Systems Analysis*, 50(2):271–277, 2014. DOI: [10.1007/s10559-014-9614-8](#).

Conferences and Workshops

- Online, July, 2020 ICML
- Vienna, February, 2020 Abstract "*Adaptive gradient descent without descent*", Workshop of the Research Group on "Applied Mathematics with Emphasis on Optimization"
- Cluj-Napoca, April, 2019 Abstract "*Golden ratio algorithm for variational inequalities*", Games, Dynamics, Optimization-2019
- Vienna, February, 2019 Abstract "*On a new method for monotone inclusions*", ESI workshop: Numerical Algorithms in Nonsmooth Optimization
- Vienna, December, 2018 Abstract: "*Bilevel composite minimization problems*", Vienna Workshop on Computational Optimization
- Marburg, November, 2018 Abstract: "*Primal-dual algorithm for linearly constrained optimization problem*", 4th Central European Set-Valued and Variational Analysis Meeting
- Bordeaux, July, 2018 Abstract: "*Primal-dual algorithm for linearly constrained optimization problem*", 23rd International Symposium on Mathematical Programming
- Malta, May, 2018 Abstract: "*Primal-dual algorithm for linearly constrained optimization problem*", 9th International Conference on Inverse Problems: Modeling and Simulation
- Chemnitz, November, 2017 Abstract: "*Golden ratio algorithms for variational inequalities*", 3rd Central European Set-Valued and Variational Analysis Meeting
- Oaxaca, Mexico, September, 2017 Abstract: "*Golden ratio algorithms for variational inequalities*", Splitting Algorithms, Modern Operator Theory, and Applications
- Vancouver, May, 2017 Abstract: "*Novel methods for saddle point problems*", SIAM Conference on Optimization
- Münster, February, 2017 Abstract: "*A first-order primal-dual algorithm with linesearch*", with T. Pock, Workshop: Shape, Images and Optimization.
- Graz, September, 2016 Abstract: "*A first-order primal-dual algorithm with linesearch*", with T. Pock, SFB Workshop: Imaging with Modulated/Incomplete Data 2016
- Tokyo, August, 2016 Abstract: "*New Projection Methods for Monotone Variational Inequalities*", The Fifth International Conference on Continuous Optimization (ICCOPT-2016).
- Poznan, July, 2016 Abstract: "*Proximal extrapolated gradient methods for variational inequalities*", 28th European Conference on Operational Research.
- Kyiv, October, 2014 Abstract: "*A Douglas-Rachford method for best approximation pair for two disjoint intersections of closed convex sets*", VI International Conference 'Computational and Applied Mathematics' dedicated to Ivan Lyashko.
- Heidelberg, September, 2013 1 Heidelberg Laureate Forum.
- Kyiv, September, 2013 Abstract: "*A Variant of Tseng's Splitting Method for Monotone Inclusion Problem*", V International Conference 'Computational and Applied Mathematics'
- Kyiv, September, 2012 Abstract: "*The approximation of a common fixed point of a finite number of Fejér mappings in Hilbert space*", V International Conference 'Computational and Applied Mathematics'
- Yalta, October, 2011 Abstract: "*About proximal algorithm for the equilibrium problem*", with V. Semenov, XVI International Conference 'Problems of Decision Making Under Uncertainties' (PDMU-2011).

Referee service

- SIAM J. Optimization
- Mathematical Programming
- Mathematical Methods of Operations Research
- Computational Optimization and Application
- Journal on Optimization Theory and Application
- Journal of Mathematical Imaging and Vision
- Inverse Problems
- Optimization
- Optimization Letters
- NeurIPS
- ICML
- ICLR

Teaching experience

- 2018-2019 Numerical methods I — Teaching assistant
2014-2015 Analysis I — Teaching assistant
2013-2014 Analysis II — Teaching assistant
2013-2014 Functional analysis — Teaching assistant
2006-2014 Olympiad mathematics for high school students

Languages

- Ukrainian native
Russian fluent
English fluent
German intermediate (B1)

Computer skills

- Programming Python
language
Other Linux, git, emacs

Awards in the national and international competitions in mathematics

- 2008, 2009 **Silver Medal**, *4th, 5th Internet Mathematical Olympiads for Students*, Ariel University Center, Israel.
2008 **3rd Prize**, *69th William Lowell Putnam Mathematics Competition*, Faculty of Mechanics and Mathematics, Taras Shevchenko National University of Kyiv.
2005, 2006 **3rd Prize**, *45th and 46th Ukrainian National Mathematics Competition for high school students*.

Participation at schools

- Austria, 2014 Gene Golub SIAM Summer School 2014. “Simulation, Optimization, and Identification in Solid Mechanics”, Linz.
Czech, 2012 Spring School on Analysis 2012. “Variational Analysis and its Applications”, Paseky nad Jizerou.
Czech, 2011 Spring School on Analysis 2011. “Functional Spaces, Approximation, Inequalities”, Paseky nad Jizerou.

Social activities

- 2009-2015 Member of jury of the Ukrainian Mathematical Olympiad (high-school level)
Training sessions for regional, Ukrainian and International mathematics competitions (high-school level)
Member of the creating and selection problem committee for Ukrainian mathematical competitions (high-school level)
- 2009-2014 Teacher at Summer Math Schools