

# Nikita Doikov

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Residence: Switzerland, Lausanne

## RESEARCH INTERESTS

Optimization (numerical methods, convex optimization, second-order methods, tensor methods, global complexity bounds, stochastic methods), Algorithms, Machine Learning, Natural Language Processing

## EDUCATION

**PhD**, [UCLouvain](#), Belgium 2021

Thesis: “[New second-order and tensor methods in Convex Optimization](#)”

Supervisor: [Yurii Nesterov](#)

**MSc**, [Skoltech](#) and [Higher School of Economics](#), Russia, GPA – 9.3/10.0 2017

Program: Mathematical Methods of Optimization and Stochastics

Thesis: “Regularized Newton method for optimizing strongly convex functions”

Supervisors: [Yury Maximov](#) and [Yurii Nesterov](#)

**BSc**, [Lomonosov Moscow State University](#), Russia, GPA – 4.9/5.0 2015

Faculty of Computational Mathematics and Cybernetics

Thesis: “Adaptive regularization of probabilistic topic models”

Supervisor: [Konstantin Vorontsov](#)

## WORK EXPERIENCE

Postdoctoral Researcher at **EPFL**, Switzerland, 2022 – *now*  
[Machine Learning and Optimization Laboratory](#)

Doctoral and Postdoctoral Researcher at **UCLouvain**, Belgium, 2019 – 2022  
[ICTEAM](#) / [CORE](#)

Research Scientist at **Samsung-HSE Laboratory**, Moscow 2018

Software Engineer at **Yandex**, Moscow, Maps Routing team 2015 – 2016

Research Engineer at **Computing Centre of RAS**, Moscow, Topic Modelling 2015

## INTERNSHIPS AND RESEARCH VISITS

Research Visit at **Université Grenoble Alpes**, [DAO team](#) Sep 2019

Software Engineering Intern at **Google**, Zürich Aug – Nov 2018

Research Visit at **KAUST**, Visual Computing Center Oct – Nov 2017

Research Intern at **Skoltech**, Center for Energy Systems Oct 2016 – Nov 2017

Software Engineering Intern at **Google**, Zürich Jul – Sep 2016

## TECHNICAL SKILLS

**Advanced:** Algorithms and Data Structures, Numerical Optimization Methods, Machine Learning, Data Analysis, Natural Language Processing, Computer Vision

**Machine Learning:** classification and clustering, learning with latent variables, regularization, graphical models, neural networks, deep learning, structural learning, reinforcement learning, variational inference

**Technologies:** C++, Python, Matlab, R, SQL, Intel Assembler, UNIX OS architecture, MapReduce, Flume, BigARTM, Vowpal Wabbit, word2vec, BERT, libsvm, liblinear, Theano, Lasagne, DistBelief, TensorFlow,  $\text{\LaTeX}$ , Git, SVN

## PUBLICATIONS

### Journals

- High-Order Optimization Methods for Fully Composite Problems*, 2022  
N. Doikov and Yu. Nesterov, [SIAM Journal on Optimization](#)
- Affine-invariant contracting-point methods for Convex Optimization*, 2022  
N. Doikov and Yu. Nesterov, [Mathematical Programming Journal](#)
- Local Convergence of Tensor Methods*, 2021  
N. Doikov and Yu. Nesterov, [Mathematical Programming Journal](#)
- Minimizing Uniformly Convex Functions by Cubic Regularization of Newton Method*, 2021  
N. Doikov and Yu. Nesterov, [Journal of Optimization Theory and Applications](#)
- Contracting Proximal Methods for Smooth Convex Optimization*, 2020  
N. Doikov and Yu. Nesterov, [SIAM Journal on Optimization](#)

### Refereed conference papers

- Convex optimization based on global lower second-order models*, 2020  
N. Doikov and Yu. Nesterov, [Advances in Neural Information Processing Systems \(NeurIPS\)](#)
- Stochastic Subspace Cubic Newton Method*, 2020  
F. Hanzely, N. Doikov, P. Richtárik and Yu. Nesterov, [Proceedings of the 37th International Conference on Machine Learning \(ICML\)](#)
- Inexact Tensor Methods with Dynamic Accuracies*, 2020  
N. Doikov and Yu. Nesterov, [Proceedings of the 37th International Conference on Machine Learning \(ICML\)](#)
- Randomized Block Cubic Newton Method*, 2018  
N. Doikov and P. Richtárik, [Proceedings of the 35th International Conference on Machine Learning \(ICML\)](#)

### Preprints

- Second-order optimization with lazy Hessians*, 2022  
N. Doikov, E.M. Chayti, M. Jaggi, [arXiv:2212.00781](#)
- Super-Universal Regularized Newton Method*, 2022  
N. Doikov, K. Mishchenko, Yu. Nesterov, [arXiv:2208.05888](#)
- Lower Complexity Bounds for Minimizing Regularized Functions*, 2022  
N. Doikov [arXiv:2202.04545](#)
- Gradient Regularization of Newton Method with Bregman Distances*, 2021  
N. Doikov and Yu. Nesterov, [arXiv:2112.02952](#)

## TEACHING EXPERIENCE

- Optimization models and methods II** at [UCLouvain](#) 2021  
Teacher assistant. Lecturers: [François Glineur](#) and [Geovani Grapiglia](#)
- Bayesian Methods in Machine Learning** at [HSE](#) 2017, 2018, 2019  
Teacher assistant. Lecturer: [Dmitry Vetrov](#)
- Optimization Methods** at [Faculty of Computer Science, HSE](#) 2017, 2018  
Seminars and practical sessions. Lecturer: [Dmitry Kroporov](#)
- Large-scale Optimization and Applications** at [Skoltech](#) 2017  
Seminars and practical sessions. Lecturers: [Elena Gryazina](#) and [Yury Maximov](#)

## ACADEMIC SERVICE

Conference reviews: ICML 2019, 2020, 2021, NeurIPS 2019, 2020, 2021, 2022

Journal reviews: Optimization Methods and Software, Journal of Optimization Theory and Applications, IEEE Transactions on Information Theory, IMA Journal of Numerical Analysis, SIAM Journal on Optimization

## CONFERENCES AND SCHOOLS

- Workshop on Advances in Continuous Optimization ([EUROPT](#)), Lisbon, 2022\*
- French-German-Portuguese conference on Optimization ([FGP](#)), Porto, 2022\*
- Workshop on Advances in Continuous Optimization ([EUROPT](#)), online, 2021\*
- [Symposium on Numerical Analysis and Optimization](#), UFPR, online, 2021\*
- Conference on Neural Information Processing Systems ([NeurIPS](#)), online, 2020\*
- International Conference on Machine Learning ([ICML](#)), online, 2020\*
- French-German-Swiss conference on Optimization ([FGS](#)), Nice, 2019\*
- International Conference on Continuous Optimization ([ICCOPT](#)), Berlin, 2019\*
- Workshop on Advances in Continuous Optimization ([EUROPT](#)), Glasgow, 2019\*
- Summer School on [Optimization, Big Data and Applications](#) in Veroli, 2019\*
- Traditional School [Control, Information and Optimization](#) in Moscow, 2018\* – 2019
- International Conference on Machine Learning ([ICML](#)), Stockholm, 2018\*
- [Recent Advances in Algorithms](#) in St. Petersburg, 2017
- [Deep Hack](#) Artificial Intelligence competition and lecture series at [MIPT](#), 2016
- Participant of the [MIPT fall programming training](#), 2014
- Winter and Summer [Programming Training Camps](#) in Petrozavodsk, 2012 – 2014
- [Winter Programming School](#) on Advanced Algorithms in Kharkiv, 2012

\*The talk was given.

## ACHIEVEMENTS AND AWARDS

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|-------------|--|
| 2020        | <a href="#">ICML</a> Top Reviewer<br><a href="#">NeurIPS</a> Oral Presentation   |
| 2019        | Best Paper Presentation Award at <a href="#">OBA School</a><br><a href="#">NeurIPS</a> Top Reviewers Award   |
| 2018        | Best Talk Award at <a href="#">Control, Information and Optimization School</a><br><a href="#">ICML</a> travel award   |
| 2015 – 2016 | Participant of <a href="#">Challenge24</a> Finals – International 24-hour Programming Contest  |
| 2015        | Top-200 in <a href="#">Facebook Hacker Cup</a><br><a href="#">Moscow festival of sport programming</a> – First degree diploma  |
| 2012 – 2015 | University Advanced Scholarship  |
| 2014        | <a href="#">Moscow festival of sport programming</a> – Second degree diploma<br><a href="#">All Siberian open programming contest</a> – Second degree diploma<br>Participant of <a href="#">ACM NEERC</a> – Third degree diploma |
| 2013        | Top-600 in <a href="#">Russian Code Cup</a>  |
| 2011        | Prizewinner of ROI (Russian National Olympiad in Informatics among high school students) – 26th place<br>Gold medal for extraordinary successes in study   |
| 2010        | Prizewinner of ROI – 90th place  |

## LANGUAGES

Russian: native

English: professional working proficiency

French: basic