Nazarii Tupitsa

PERSONAL DATA

ORCID ID: 0000-0002-9005-0129
Scopus ID: 57215309728
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RESEARCH INTERESTS

Optimization, Optimal Transport, Machine Learning

EDUCATION

2016–2020 **PhD in Mathematical modeling, numerical methods and software packages**
Moscow Institute of Physics and Technology (MIPT)

2014–2016 **Master of Science in Applied Mathematics and Physics**
Moscow Institute of Physics and Technology (MIPT)
Thesis: "Near-Earth Objects Orbit Determination with Very Short Optical Arcs"

2010–2014 **Bachelor of Science in Applied Mathematics and Physics**
Moscow Institute of Physics and Technology (MIPT)
Thesis: "Near-Earth Objects Orbit Determination with Very Short Optical Arcs"
Advisor: Alexey Kolessa

PUBLICATIONS

1. Sergey Guminov, Pavel Dvurechensky, Nazarii Tupitsa, and Alexander Gasnikov. On a Combination of Alternating Minimization and Nesterov's Momentum. In *Proceedings of the 38th International Conference on Machine Learning, ICML 2021, 18-24 July 2021, Online*, 2021

2. Nazarii Tupitsa, Pavel E. Dvurechensky, Alexander V. Gasnikov, and César A. Uribe. Multimarginal optimal transport by accelerated alternating minimization. In *59th IEEE Conference on Decision and Control, CDC 2020, Jeju Island, South Korea, December 14-18, 2020*, pages 6132–6137. IEEE, 2020

3. Nazarii Tupitsa, Pavel Dvurechensky, Alexander Gasnikov, and Sergey Guminov. Alternating minimization methods for strongly convex optimization. *Journal of Inverse and Ill-posed Problems*, 29(5):721–739, 2021

4. Alexey Kroshnin, Nazarii Tupitsa, Darina Dvinskikh, Pavel Dvurechensky, Alexander Gasnikov, and Cesar A. Uribe. On the complexity of approximating wasserstein barycenters. In *Proceedings of the 36th International Conference on Machine Learning, ICML 2019, 9-15 June 2019, Long Beach, California, USA*, pages 3530–3540, 2019

5. AV Gasnikov, DM Dvinskikh, PE Dvurechensky, DI Kamzolov, VV Matyukhin, DA Pasechnyuk, NK Tupitsa, and AV Chernov. Accelerated meta-algorithm for convex optimization problems. *Computational Mathematics and Mathematical Physics*, 61(1):17–28, 2021

6. Nazarii Tupitsa, Alexander Gasnikov, Pavel Dvurechensky, and Sergey Guminov. Strongly convex optimization for the dual formulation of optimal transport. In *Mathematical Optimization Theory and Operations Research. MOTOR 2020. Communications in Computer and Information Science, vol 1275.*, pages 192–204. Springer International Publishing, 2020

7. Daniil Merkulov and Nazarii Tupitsa. On accelerated methods for tensor canonical polyadic decomposition. In *Proceedings of MIPT*, volume 12, No.4(48), pages 61–71, 2020

CONFERENCE TALKS AND POSTERS

1. M. Kurkin, I. Udovichenko, D. Merkulov, N. Tupitsa. On accelerated methods for tensor train decomposition. Quasilinear Equations, Inverse Problems and Their Applications, Sochi, Russia, August 22–26. Conference Talk.

2. S. Guminov, P. Dvurechensky, N. Tupitsa, A. Gasnikov. On a Combination of Alternating Minimization and Nesterov's Momentum. International Conference on Machine Learning, July 20, 2021, Online. Poster.

3. N. Tupitsa, P. Dvurechensky, A. Gasnikov, and C. Uribe. Multimarginal Optimal Transport by Accelerated Alternating Minimization. Quasilinear Equations, Inverse Problems and their Applications, December 30 – December 2, 2020, Online. Conference Talk.

4. N. Tupitsa , A.Gasnikov , P.Dvurechensky, S. Guminov. Strongly convex optimization for the dual formulation of optimal transport. 19th International Conference on Mathematical Optimization Theory and Operation Research (MOTOR-2020), Novosibirsk, Russia, July 6–10, 2020. Conference Talk.

5. N. Tupitsa , A.Gasnikov , P.Dvurechensky. Accelerated Alternating Minimization for Non-convex Problems. Quasilinear Equations, Inverse Problems and their Applications, December 2–4, 2019, Dolgoprudny, Russia. Conference Talk.

6. Tupitsa N.K. Some Features Of Unknown Near-Earth Object Orbit Determination With Two Short Optical Arcs, Substantially Spaced In Time. 58th MIPT Scientific Conference, November 23-28, 2015, Dolgoprudny, Russia. Conference Talk.

7. Kolessa A.E., Tupitsa N.K., Andrianov N.G. Determination Of Near-Earth Object Orbit Based On Angular Measurements By Optical Telescope During Two Short Sessions Of Observations At Different Passes. International conference Near-Earth Astronomy, August 31- September 5, 2015, Terskol, Russia. Conference Talk.

8. A.E. Kolessa, N.K. Tupitsa, Estimation of an Unknown Earth-Orbiting Object Orbit Basing on Two Short Optical Tracks Extracted at Different Observation Sessions. International conference Engineering & Telecommunications - En&T 2014, November 26-28, 2014, Dolgoprudny, Russia. Conference Talk.

FUNDING ACQUISITION

Optimal Transport: Numerical methods and application to data analysis, 2018-2021, Russian Science Foundation, https://rscf.ru/en/project/18-71-10108/

Optimal Transport: Numerical methods and application to data analysis, 2021 - 2023 , Russian Science Foundation, https://rscf.ru/en/project/21-71-03012/

Development of numerical optimization methods in applications to control problems, inverse problems and learning, 2021 - 2024 , Russian Science Foundation, https://rscf.ru/en/project/21-71-30005/

TEACHING EXPERIENCE

2018-Now **Lecturer**
Department of Mathematical Foundations of Control of MIPT
Lectures and seminars on optimization theory for fifth and third year students

2018–Now **Assistant Lecturer**
Department of Discrete Mathematics of MIPT
Seminars on discrete mathematics for first year students

2016 **Teaching Assistant**
Department of Radio Engineering and Control Systems of MIPT
Laboratory practicals on digital electronics

SUMMER SCHOOLS

July-August 2021. Participant of summer school "Modern Methods Of Information Theory, Optimization And Control", Sochi

June 2020. Participant of summer school "Modern Methods Of Information Theory, Optimization And Control", Sochi

June 2020. Participant of Traditional Youth School "Control, Information and Optimization", Sochi

June 2019. Participant of Traditional Youth School "Control, Information and Optimization", Moscow

WORK EXPERIENCE

2022–Now **Reaseacher**
Marchuk Institute Of Numerical Mathematics Of The Russian Academy Of Sciences

2021–Now **Lead Reaseacher**
Laboratory of Advanced Combinatorics and Network Applications
Conducting research on different tasks co-financed by Moscow Institute of Physics and Technology

2020–2021 **Reaseacher**
National Research University Higher School of Economics

2018–Now **Researcher**
Moscow Institute of Physics and Technology

2018–Now **Intern researcher**
The Institute for Information Transmission Problems

2017–2018 **Software Developer**
Laboratory Of X-Ray Recording Systems of MIPT
Development of software for the automated evaluation of the characteristics of X-ray radiography detectors

2014–2015 **Engineer-Developer**
Design Center of Department of Radio Engineering and Cybernetics of MIPT
Development of of training simulator for students who study radar direction finding

2012–2015 **Engineer-Developer**
Russian JS Company "Interstate Joint Stock Corporation "Vimpel"
The organization where I did my undergraduate research. Also some related commercial projects were done.

INTERNSHIPS

2017 **Intern**
Laboratory of Digital Special-Purpose Systems of MIPT
Modern neural networks features correlation filter tracker was studied. HOG features correlation filter tracker was implemented

2012 **Intern**
Parallels, Inc
Existed distributed data storage systems, such as Amazon Simple Storage Service and Windows Azure Storage were studied. As well as the general theory related to them.

LANGUAGES

Russian: Native

English: Advanced

COMPUTER SKILLS

Operating Systems: Advanced Linux User, Microsoft Windows

Programming Languages: C, C++, Python, MatLab, LaTeX, Java SE, Java EE

Last updated on January 12, 2023