Aleksei Sholokhov **aksh@uw.edu**

CONTACT INFORMATION

University of Washington
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Personal Site
GitHub
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HIGHLIGHTS

Hi, I am Aleksei. My passion is optimization for statistical learning. I am a PhD student with strong coding skills studying Applied Math at UW. I work on feature selection, time series forecasting, and uncertainty propagation for ML models. I am also interested in deep learning, automatic differentiation tools, and HPC techniques for them.

RESEARCH EXPERIENCE

Institute for Health Metrics and Evaluation, UW August, 2019 - Present

Graduate Research Assistant in Math Science Team. Projects:

- IHME Projections for COVID-19: development and implementation of a statistical model that projects cases and deaths from COVID-19 across the world (paper).

Grenoble Informatics Laboratory, UGA March - October 2018

Visiting Research Student working on large-scale multi-label classification. Projects:

- MEMOIR: multi-class extreme-scale SVM classifier with inexact margin (paper)

Center for Nonlinear Studies, LANL January, 2018

Visiting Research Student working on reinforcement learning in demand-response problems for power systems control. This work resulted in my bachelor thesis.

Computing Center of Russian Academy of Science, Moscow January, 2016 - 2018

- `rysearch`: an exploratory search engine and recommender system that simplifies knowledge discovery. Based on MongoDB and BigARTM.

SOFTWARE DEVELOPMENT EXPERIENCE

Proficient in Python. Implemented projects in C++, MATLAB, Scala, Java.
GitHub: aksholokhov. Selected projects:

- `skmixed`: python package for feature selection in mixed-effect models that uses a novel ℓ_0-norm based approach. The package is fully `sklearn`-compartible.
- `gspack`: autograder that radically simplifies creating coding assignments on Gradescope. This package is used for 5 classes at AMATH UW, for 1500+ students and counting.

Notable contributions:

- `rysearch`: an exploratory search engine and recommender system. Based on MongoDB and BigARTM.

PUBLICATIONS

1. Modeling COVID-19 scenarios for the United States. IHME Covid-19 Forecasting Team (methods contributor). *Nature Medicine*, 2020.

Preprints

1. "Sparse Relaxed Regression for Covariates Selection in Mixed Models." **Sholokhov. A.,** Zheng. P., Aravkin, A. *(in progress).*
2. "A Scalable Data-Driven Transmission Model for COVID-19 Scenario Projections". P. Zheng, M. Bannick, **A. Sholokhov**, J. Zhang, R. Reiner, C. J.L. Murray, A. Aravkin, *Currently under review in International Journal of Forecasting*, 2020.
3. "MEMOIR: Multi-class Extreme Classification with Inexact Margin." Belyy, A., **Sholokhov. A.,** *arXiv preprint arXiv:1811.09863 (2018).*

Conferences

1. "Quality Evaluation and Improvement for Hierarchical Topic Modelling.", Belyy A.V., Selezniova, M.S., **Sholokhov, A.,** and Vorontsov, K., *24rd International Conference on Computational Linguistics and Intellectual Technologies*
2. "Heterogeneous Aggregation of Text Data into Hierarchical Topic Models" Selezniova, M.S., Belyy A.V., and **Sholokhov, A.**, 2017. *60th Scientific MIPT Conference.*
3. "Conditional Coordinate Descent Method for Large-Scale Statistical Estimations" 2017. **Sholokhov, A.**, *60th Scientific MIPT Conference.*

Poster Sessions and Talks

1. "Conditional Coordinate Descent Method for Large-Scale Statistical Estimations" **Sholokhov, A.**, 2017. *2nd Physics Informed Machine Learning*

Teaching Experience

Teaching Associate in University of Washington — January 2019 – Present

- Calculus with Analytic Geometry II — Winter 2019
- Calculus with Analytic Geometry II — Spring 2019
- Scientific Computing in MATLAB — Fall 2019
- Optimization: Fundamentals and Applications — Winter 2020
- High-Performance Scientific Computing — Spting 2020

Teaching Assistant in Remote High School of MIPT — September 2015 – 2016

- Mathematics, General Physics

Service and Outreach

University of Washington, Seattle, USA — August 2018 - June 2023

Diversity, Equity, and Inclusion (DEI) Committee member.

- Created 10 years Diversity Action Plan for the Department of Applied Mathematics
- Organized and lead on basics of diversity during DEI week.

Education

University of Washington, Seattle, USA — August 2018 - June 2023

Ph.D. Student in the Department of Applied Mathematics; GPA: 3.81/4.

- Research Advisor: Aleksander Aravkin

Moscow Institute of Physics and Technology, Moscow, Russia — July 2018

B.Sc. in Applied Mathematics and Physics,
Department of Control and Applied Mathematics

- Thesis Title: *Multi-armed Bandits in Demand-Response Problems*
- Research Advisor: Yury Maximov

Awards

Study Awards

- University of Washington's Top Scholar Award, September 2018
- MIPT Scholarship "For Outstanding Studying Effort" December 2015