Aleksei Sholokhov

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EDUCATION

University of Washington **Seattle, WA**
Ph.D. in Applied Mathematics *Expected Graduation: 07/2023*

Moscow Institute of Physics and Technology **Moscow, Russia**
B.Sc. in Applied Mathematics and Physics *07/2018*

SKILLS

Machine Learning Algorithms and Deep Learning **Seattle, WA**
As Research Assistant at University of Washington, Seattle, WA *09/2018-now*

- Created an algorithm to distill learned physics laws from neural networks. It decreased the amount of data needed to model noisy dynamical systems by 90%.
- Adapted novel optimization methods to accelerate training of deep neural networks using `tensorflow`, `jax`, and `CUDA`. Achieved state-of-the-art performance in some image recognition applications.

Data Science and Data Analytics **Seattle, WA**
As Research Assistant at Institute for Health Metrics and Evaluation (IHME) *09/2018-now*

- Devised new statistical models to improve the reliability of Global Burden of Diseases research. Implemented as a Python package and integrated it with the company's pipelines achieving 3000% acceleration.
- Developed IHME Projections: a statistical model that projects cases and deaths from COVID-19 globally. Collaborated with a team of 130 researchers while working on it. This tool helped the decision makers, like CDC, to properly allocate scarce resources at the beginning of the pandemic.

Software Development in Python and C++ **Seattle, WA**
As Research Assistant at University of Washington and IHME *09/2018-now*

- Developed `gspack`: python-autograder to accelerate creating of coding assignments. This package is successfully used for 5 scientific computing classes for over 3000 students in Department of Applied Mathematics.
- Enabled large-scale SVM classifiers to work with big data. Implemented it as a package `MEMOIR` using SQL, C++, and Python. Improved the accuracy and memory management by 30%.

Project Management, Communication, Teamwork **Moscow, Russia**
As Research Student at Computing Center of Russian Academy of Science *02/2016-07/2018*

- Created `rysearch`: an exploratory search engine and recommender system that simplifies knowledge discovery with MongoDB, BigARTM.
- Organized and coordinated research and software development in the team of 3 researchers.
- Developed and published 2 novel metrics for automatic quality assessment of hierarchical topic models.

SELECTED PUBLICATIONS

More at scholar.google.com/citations?user=_2uniNcAAAAJ

- **``Universal Feature Selection for Mixed-Effects Models with Non-convex Penalties"**
  Together with Santomauro D., Burke J., Zheng P., and Aravkin A., *in preparation*
- **``Distillation of Neural Differential Equations for Interpretable Model Discovery"**
  Together with Kutz, N., and Brunton, S. *in preparation*
- **``pysr3: Python Library for Sparse Relaxed Regularized Regression"**
  Together with Zheng, P., and Aravkin, A., *under peer-review*
- **``Modeling COVID-19 scenarios for the United States''.**
  Together with IHME Covid-19 Forecasting Team. *Nature Medicine*, 2020.

- **``Quality Evaluation and Improvement for Hierarchical Topic Modelling.''**,
  Together with Belyy A.V., Selezniova, M.S., and Vorontsov, K.,
  24rd International Conference on Computational Linguistics and Intellectual Technologies
- **``MEMOIR: Multi-class Extreme Classification with Inexact Margin."**
  Together with Belyy, A.,*arXiv preprint arXiv:1811.09863 (2018).*

SERVICE AND OUTREACH

Department of Applied Mathematics, University of Washington **Seattle, WA**
Diversity, Equity, and Inclusion (DEI) Committee Member *09/2020 - Now*

- Developed 10-years Diversity Action Plan for the Department of Applied Mathematics
- Organized and led educational seminars on importance of diversity in academia.
- Interviewed faculty job candidates to assess their DEI action track.