Aleksei Sholokhov

202 Lewis Hall, Seattle, WA 98105
linkedin.com/in/aksholokhov aksh@uw.edu aksholokhov 505-557-59-81

EDUCATION

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

SKILLS

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

- Decreased the amount of data needed to model noisy dynamical systems by a factor of 10 by integrating `Neural ODE` techniques into model discovery library `SINDy`.
- Accelerated training of deep neural networks using higher-order methods. Implemented it as `TensorFlow` and `jax` modules. Achieved state-of-the-art performance for selected image recognition tasks.

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

- Invented new statistical modeling tool `pysr3` that selects features using novel optimization techniques. Implemented it as a `scikit-learn`-compatible `python` package. Achieved 30-fold speed-up upon deployment.
- Developed a statistical model that projects cases and deaths from COVID-19; in collaboration with a team of 130 researchers. It helped the decision makers to manage resources and plan ahead during the pandemic.

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

- Developed `gspack`: python-autograder to accelerate grading of coding assignments. This package is successfully used for 5 scientific computing classes for over 3000 students in Department of Applied Mathematics.
- Enabled SVM classifiers to work with large-scale data using approximate nearest neighbor search. Implemented it using `SQL`, `C++`, and `Python`. Improved accuracy and memory costs by 30% over the competitors.
- Learned `OpenMP`, `MPI`, and `CUDA` by working as a teacher assistant for graduate-level High-Performance Scientific Computing classes for two years. Learned `MATLAB` by teaching Scientific Computing for 1 year.

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

- Lead `RySearch` project: an exploratory data analysis and recommender system that simplifies knowledge discovery with NLP techniques such as topic-modeling. Implemented using `python`, `JavaScript`, and `MongoDB`.
- Effectively organized research and software development in the team of 4 researchers. Published 2 novel quality metrics for topic models based on this work.

Negotiation Skills, Cross-Functional Collaboration, and Cross-Cultural Dialog **Seattle, WA**
As a Diversity, Equity, and Inclusion (DEI) Committee Member at UW *09/2020 - Now*

- Developed 10-years Diversity Action Plan for the Department of Applied Mathematics.
- Negotiated $20k financial commitment from the department to Early Scholars Program.
- Organized and led educational seminars on importance of diversity and inclusion in academia.

SELECTED PUBLICATIONS

- Sholokhov A., Santomauro D., Burke J., Zheng P., and Aravkin A., "Universal Feature Selection for Mixed--Effects Models with Non-ŏ onvex Penalties", *in preparation*
- Sholokhov, A., Zheng, P., and Aravkin, A., "pysr3: Python Library for Sparse Relaxed Regularized Regression", *under peer-review*
- IHME Covid-19 Forecasting Team, "Modeling COVID-19 scenarios for the United States". *Nature Medicine, 2020*
- Belyy A.V., Selezniova, M.S., Sholokhov, A., and Vorontsov, K., "Quality Evaluation and Improvement for Hierarchical Topic Modelling", *24rd International Conference on Computational Linguistics*