Aleksei Sholokhov

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SUMMARY

- I am a **Ph.D. candidate** in applied mathematics specializing in **machine learning** for modeling physical systems.
- I have strong background in optimization, differentiable programming, numerical methods, and optimal control.
- I love coding: I completed multiple projects in **Python, Scala, and C++**, for both academic and corporate use.
- I enjoy research: I contributed to **12 research papers** in machine learning and statistical modeling.
- I am excited to complete amazing projects as a **Machine Learning Engineer / Scientist** at your company.

EDUCATION

University of Washington **Seattle, WA**
Ph.D. in Applied Mathematics *Expected Graduation: 05/2023*

SKILLS

Research in Machine Learning Algorithms, Deep Learning, and Optimization **Boston, MA**
Mitsubishi Electric Research Labs, Inc. (MERL), Machine Learning Research Intern *03/2022-06/2022*

- Created a new deep learning algorithm for predicting behavior of physical phenomena. Implemented it using `pytorch` and `Neural ODE`. Successfully met specifications of an embedded device; improved the target metrics by 250%.
- Drove 1 paper from proposal to completion in 3 months and contributed, as a second author, to 1 additional paper.

Machine Learning Engineering and Infrastructure **Seattle, WA**
Stripe, Inc., Machine Learning Engineer Intern *06/2022-09/2022*

- Designed and implemented a calibration pipeline for large deep learning and `xgboost` models using `flyte` and `airflow` frameworks. Improved the target metrics by 300%. Enabled the team to offer their products to a much broader audience.
- Transformed my team's vision into a project proposal. Communicated extensively with my leadership to ensure meeting the company's needs. Presented 3 times at department-wide meetings. Drove the project to production in 3 months.

Data Science and Statistical Analysis **Seattle, WA**
Institute for Health Metrics and Evaluation, Research Assistant at Math Sciences Team *09/2019-12/2021*

- Invented new statistical modeling tool `pysr3` which does feature selection for mixed-effect models. Used new optimization algorithms to achieve 30x speedup. This work led to 3 papers at top peer-reviewed journals and 1 open-source package.
- Developed a statistical model that projects cases and deaths from COVID-19 in collaboration with a team of 130 researchers to help governmental decision-makers manage resources and plan ahead during the pandemic.

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

- Developed `gspack`: an autograder that accelerates grading of coding assignments in Matlab and Python. This package is successfully used for 5 scientific computing classes for thousands of assignments in the Dept. 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 competitors.

Negotiation Skills, Cross-Functional Collaboration, and Cross-Cultural Dialog **Seattle, WA**
As a Diversity, Equity, and Inclusion (DEI) Committee Member at UW *09/2020 - 03/2022*

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

SELECTED PUBLICATIONS

- Sholokhov A. et. al. "A Relaxation Approach to Feature Selection for Linear Mixed Effects Models", *arXiv:2205.06925*
- Sholokhov A. et. al. "pysr3: Python Library for Sparse Relaxed Regularized Regression", *ICCOPT 22*
- IHME Covid-19 Forecasting Team, "Modeling COVID-19 scenarios for the United States". *Nature Medicine*