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EDUCATION

University of Washington

Ph.D. in Applied Mathematics

Seattle, WA

Expected Graduation: 07/2023

University of Washington

M.Sc. in Applied Mathematics

Seattle, WA

07/2021

SKILLS

Research in Machine Learning Algorithms and Deep Learning

Seattle, WA

As Research Assistant at University of Washington

09/2018-now

- Created an algorithm that extracts interpretable models and learns physics laws from trained neural networks. Decreased the amount of data needed to model noisy dynamical systems by a factor of 10.
- Accelerated training of deep neural networks using higher-order methods, and implemented image recognition libraries 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 tools that extract meaningful features for machine learning models. Implemented it as a **python** package **skmixed** that is fully compatible to **scikit-learn**. Achieved 30-fold speed-up upon deployment to the institute's pipelines.
- Developed IHME Projections: a statistical model that projects cases and deaths from COVID-19 globally; in cross-functional collaboration with a team of 130 researchers. This tool helped the decision makers (including local, state, and national governments) 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 stochastic optimization. Implemented it as an open-source package **MEMOIR** using **SQL**, **C++**, and **Python**. Improved the accuracy and memory management by 30% over state-of-the art approaches.
- 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

- Developed strong analytical, communication, and quantitative problem-solving skills by teaching graduate-level classes on Scientific Computing, HPC, and Optimization to classes of 200+ students (UW).
- 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 and successfully met tight deadlines. 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.
- Introduced Early Scholars Program to the department leadership. Secured \$20k of financial commitment to the program as a result of tense negotiations.
- Organized and led educational seminars on importance of diversity and inclusion in academia.

SELECTED PUBLICATIONS

- **“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)*.