Polina Kirichenko

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Google Scholar, Semantic Scholar 🎓

Education

Ph.D. student in Data Science, New York University — New York, USA
Center for Data Science; supervisor: Professor Andrew Gordon Wilson — 2019 – current
Research interests: out-of-distribution generalization, robustness, uncertainty estimation

Ph.D. student in Operations Research, Cornell University — Ithaca, USA
Operations Research and Information Engineering department; transferred to NYU — 2018 – 2019

B.Sc. in Computer Science, Higher School of Economics — Moscow, Russia
Computer Science department; supervisor: Professor Dmitry Vetrov — 2014 – 2018
Cumulative GPA: 9.1 (10.0 scale), class rank: top 3%

Work Experience

Meta AI, FAIR — New York, USA
Visiting Researcher (FAIR-NYU AI Mentorship program); supervisor: Rama Vedantam — Oct 2022 – Oct 2023
Research topic: out-of-distribution generalization

Meta AI — Menlo Park, USA
Research Intern at AI Integrity team; supervisors: Hamed Firooz, Randall Balestriero, David Lopez-Paz — June 2022 – Sep 2022
Research topic: biases of data augmentation and regularization in deep networks

Cold Spring Harbor Laboratory — Cold Spring Harbor, USA
Research Intern; supervisor: Prof. Anthony Zador — June 2021 – Aug 2021
Research topics: meta-learning with compressed neural networks

DeepMind — (remotely) Mountain View, USA
Research Scientist Intern; supervisors: Mehrdad Farajtabar, Razvan Pascanu, Balaji Lakshminarayanan — June 2020 – Oct 2020
Research topic: continual learning with deep generative models

École Polytechnique Fédérale de Lausanne (EPFL) — mlo.epfl.ch, Lausanne, Switzerland
Machine Learning and Optimization Lab — June 2018 – Aug 2018
Research Intern; supervisors: Prof. Martin Jaggi, Prof. Dan Alistarh
Research topic: evolution strategies for low precision training of neural networks

Bayesian Methods Research Group — bayesgroup.ru, Moscow, Russia
Research Assistant; supervisor: Prof. Dmitry Vetrov — Sep 2016 – Aug 2018
Research topic: structured sparsification of Bayesian neural networks

Google — Seattle, USA
Software Engineering Intern, Google Cloud Platform Team — July 2017 – Sep 2017

Google — Munich, Germany
STEP Software Engineering Intern, Piper Team (Google's version control system) — July 2016 – Sep 2016

Publications

* Equal Contribution

On Feature Learning in the Presence of Spurious Correlations [arXiv]
Pavel Izmailov*, **Polina Kirichenko***, Nate Gruver*, Andrew Gordon Wilson
First presented at *ICML Workshop on Principles of Distribution Shift 2022*
Neural Information Processing Systems (NeurIPS) 2022

Chroma-VAE: Mitigating Shortcut Learning with Generative Classifiers

Wanqian Yang, **Polina Kirichenko**, Micah Goldblum, Andrew Gordon Wilson
Neural Information Processing Systems (NeurIPS) 2022

Last Layer Re-Training is Sufficient for Robustness to Spurious Correlations [arXiv, code]

Polina Kirichenko*, Pavel Izmailov*, Andrew Gordon Wilson
ICML Workshop on Spurious Correlations, Invariance, and Stability 2022 **(oral presentation)**
Under Review

Does Knowledge Distillation Really Work? [arXiv, code]

Samuel Stanton, Pavel Izmailov, **Polina Kirichenko**, Alexander A. Alemi, Andrew G. Wilson
Neural Information Processing Systems (NeurIPS) 2021

Task-agnostic Continual Learning with Hybrid Probabilistic Models [arXiv, poster]

Polina Kirichenko, Mehrdad Farajtabar, Dushyant Rao, Balaji Lakshminarayanan, Nir Levine,
Ang Li, Huiyi Hu, Andrew Gordon Wilson, Razvan Pascanu
ICML Workshop on Invertible Neural Networks and Normalizing Flows 2021 **(spotlight talk)**

Why Normalizing Flows Fail to Detect Out-of-Distribution Data [arXiv, code]

Polina Kirichenko*, Pavel Izmailov*, Andrew G. Wilson
First presented at *Workshop on Invertible Neural Networks and Normalizing Flows at ICML 2020*
Neural Information Processing Systems (NeurIPS) 2020

Semi-Supervised Learning with Normalizing Flows [arXiv, poster, code]

Pavel Izmailov*, **Polina Kirichenko***, Marc Finzi*, Andrew G. Wilson
First presented at *Workshop on Invertible Neural Networks and Normalizing Flows at ICML 2019*
International Conference on Machine Learning (ICML) 2020

Subspace Inference for Bayesian Deep Learning [arXiv, poster, slides, code]

Pavel Izmailov*, Wesley Maddox*, **Polina Kirichenko***, Timur Garipov*, Dmitry Vetrov, Andrew G. Wilson
First presented at *Workshop on Uncertainty & Robustness in Deep Learning at ICML 2019* **(contributed talk)**
Uncertainty in Artificial Intelligence (UAI) 2019

SWALP: Stochastic Weight Averaging in Low Precision Training [PMLR, code]

Guandao Yang, Tianyi Zhang, **Polina Kirichenko**, Junwen Bai, Andrew G. Wilson, Christopher De Sa
International Conference on Machine Learning (ICML) 2019

Workshop Papers

Effective Surrogate Models for Protein Design with Bayesian Optimization [pdf]

Nate Gruver, Samuel Stanton, **Polina Kirichenko**, Marc Finzi, Phillip Maffettone, Vivek Myers, Emily Delaney,
Peyton Greenside, Andrew Gordon Wilson
ICML Workshop on Computational Biology 2021

Invertible Convolutional Networks [pdf, poster]

Marc Finzi*, Pavel Izmailov*, Wesley Maddox*, **Polina Kirichenko***, Andrew G. Wilson
Workshop on Invertible Neural Nets and Normalizing Flows at ICML 2019 **(spotlight talk)**

Awards

DeepMind Fellowship	2019
New York University Center for Data Science Graduate Fellowship	2019
Golden HSE Award (Alumni Success category)	[link], 2019
HSE Alumni Academic Fellowship	[link], 2019
NeurIPS Travel Award	2019
ICML Travel Award	2019
Cornell Operations Research and Information Engineering Graduate Fellowhship	2018
Travel Grant for Women in Data Science Conference	[link], 2018, 2019
Ilya Segalovich Scholarship (Yandex)	[link], 2016, 2017
Google Anita Borg Memorial Scholarship (Women Techmakers Scholarship)	2015
Google Travel Grant for the Grace Hopper Celebration of Women in Computing	2015

Reviewing

Conferences: NeurIPS 2019 (top 400 highest-scoring reviewers), ICLR 2020, ICML 2020 (top 33% reviewer), UAI 2020, NeurIPS 2020, AISTATS 2021, AISTATS 2022, NeurIPS 2022

Workshops: NeurIPS 2019 WiML, NeurIPS 2019 BDL, ICML 2020 UDL, NeurIPS 2020 HAMLETS, ICML 2021 INNF+, ICML 2021 UDL, NeurIPS 2021 BDL, NeurIPS 2022 DistShift

Talks

"Last Layer Re-Training is Sufficient for Robustness to Spurious Correlations"
- Oral Presentation at the ICML Workshop on Spurious Correlations, Invariance, and Stability   [link], 2022
- Genentech, AI seminar   2022

"Robustness of Deep Learning Models to Distribution Shift", WiML Un-Workshop at ICML   2022

"Why Normalizing Flows Fail to Detect Out-of-Distribution Data"
- ML Collective, Deep Learning: Classics and Trends (with Robin T. Schirrmeister)   [slides], 2021
- Facebook AI Research, Uncertainty team   2021
- CogSys Talks, Technical University of Denmark   [video], 2020
- Capital One, Machine Learning seminar   2020
- NeurIPS 2020   [video], 2020
- INNF+: Invertible Neural Networks and Normalizing Flows workshop at ICML   [video], 2020

"Applications of normalizing flows: semi-supervised learning, anomaly detection, and continual learning"
- **Keynote talk at ICML Workshop on Representation Learning for Finance Applications** [video], 2021

"Does your model know what it doesn't know?", WiML Un-Workshop at ICML   2021

"Task-agnostic Continual Learning with Hybrid Probabilistic Models", ICML INNF+ 2021   [video], 2021

"Continual Learning in Neural Networks" [in Russian], Bayesian Methods Research Group seminar   [video], 2021

"Anomaly detection via Generative Models"
- ODS DafaFest 2020, Uncertainty Estimation in ML Workshop   [video], 2020

"Uncertainty Estimation in Bayesian Deep Learning", WiML Un-Workshop at ICML   2020

"Subspace Inference for Bayesian Deep Learning"
- University of Paris-Saclay, UQSay seminar   [link], 2021
- Uncertainty and Robustness in Deep Learning workshop at ICML   [video], 2019
- Higher School of Economics (with Pavel Izmailov)   [video], 2019

"How do we build neural networks we can trust?", Broad Institute of MIT and Harvard   [video], 2019

Technical Skills

Programming languages: Python, C++
Deep learning frameworks: PyTorch, TensorFlow, Keras

Teaching

Cornell University   Ithaca, USA
Teaching Assistant for "Data Science for All" course   Jan 2019 – May 2019

Bayesian Methods for Machine Learning on Cousera   [course link], Moscow, Russia
Teaching Assistant; helped prepare assignments and quizzes   Sep 2017 – Aug 2018
The specialization of the course received Coursera Outstanding Educator Award

National Research University Higher School of Economics   Moscow, Russia
Teaching Assistant for "Probability Theory and Statistics" (Sep 2016 – June 2017),
"Introduction to Data Analysis" (Jan 2016 – June 2016), "Introduction to Programming" (Sep 2015 – Dec 2015)