

Arsenii Ashukha

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I'm a Research Scientist at Samsung AI Center Moscow. I (almost) received a PhD in Machine Learning under supervision of [Dmitry Vetrov](#). The results of my PhD were published at ICLR / ICML / NeurIPS and contributed to sparsification, uncertainty estimation, ensembling, computer vision, and fundamentals of Bayesian deep learning. Prior to that, I was a part of Yandex Research in collaboration with University of Amsterdam, where I worked on Bayesian deep learning with Dmitry Vetrov and Max Welling. I did ML engineering internships at Yandex (deep learning for music), Rambler (recommendation systems), and worked on NLP at Research Computing Center MSU with Natalia Loukachevitch.

PUBLICATIONS

Google Scholar: scholar.google.com/citations?user=IU-kuP8AAAAJ

* denotes joint first co-authorship

- Resolution-robust Large Mask Inpainting with Fourier Convolutions**, WACV 2022 [arXiv](#) / [code](#)
Roman Suvorov, Elizaveta Logacheva, Anton Mashikhin, Anastasia Remizova, **Arsenii Ashukha**, Aleksei Silvestrov, Naejin Kong, Harshith Goka, Kiwoong Park, Victor Lempitsky
- Pitfalls of In-Domain Uncertainty Estimation and Ensembling in Deep Learning**, ICLR 2020 [arXiv](#) / [code](#)
Arsenii Ashukha*, Alexander Lyzhov*, Dmitry Molchanov*, Dmitry Vetrov
- Greedy Policy Search: A Simple Baseline for Learnable Test-Time Augmentation**, UAI 2020 [arXiv](#) / [code](#)
Arsenii Ashukha*, Dmitry Molchanov*, Alexander Lyzhov*, Yuliya Molchanova*, Dmitry Vetrov
- The Deep Weight Prior**, ICLR 2019 [arXiv](#) / [code](#)
Arsenii Ashukha*, Andrei Atanov*, Kirill Struminsky, Dmitry Vetrov, Max Welling
- Variance Networks: When Expectation Does Not Meet Your Expectations**, ICLR 2019 [arXiv](#) / [code](#)
Arsenii Ashukha*, Kirill Neklyudov*, Dmitry Molchanov*, Dmitry Vetrov
- Structured Bayesian Pruning via Log-Normal Multiplicative Noise**, NeurIPS 2017 [arXiv](#) / [code](#)
Kirill Neklyudov, Dmitry Molchanov, **Arsenii Ashukha**, Dmitry Vetrov
- Variational Dropout Sparsifies Deep Neural Networks**, ICML 2017 [arXiv](#) / [code](#)
Arsenii Ashukha*, Dmitry Molchanov*, Dmitry Vetrov

PROFESSIONAL EXPERIENCE

- 2018 April - Now **Research Scientist, Samsung AI Center Moscow**
I'm working on the development of deep learning algorithms. Specifically, my work is focused on uncertainty estimation, robustness, and fundamentals of Bayesian deep learning. I also contributed to computer vision research e.g., image inpainting.
- 2016 Feb - 2018 April **Research Scientist, HSE & Yandex & University of Amsterdam**
Created *sparse variational dropout*, a method for sparsification of DNNs that, for the first time, allowed to achieve over 250x compression ratio (results published at ICML'17). The modified version of SparseVD with neuron-level sparsity allowed to accelerate inference of a CNN by 2-5 times and was involved in the feature extraction for real image retrieval system (published at NeurIPS).

- 2016 May - 2016 Sep **Machine Learning Engineer Intern, Yandex**
I worked on feature extraction techniques for music data with convolutional neural networks. I also developed an evaluation of learned representations. The representations were used in the content-based recommendation system for Yandex music.
- 2015 May - 2015 Oct **Machine Learning Engineer Intern**
Worked on recommendation systems. My responsibility included improving the quality and performance of automatic feature extraction algorithms, and recommendation algorithms.

EDUCATION

- 2017 - 2022 **PhD in Machine Learning, National Research University Higher School of Economics**
Thesis title: Prior Knowledge for Deep Learning Advisor: [Dmitry Vetrov](#)
- 2015 - 2017 **MSc in Computer Science, Moscow Institute of Physics and Technology** (worked on sparse DNNs) with Distinction (GPA 4.87/5.0)
- 2011 - 2015 **BSc in Computer Science, Bauman Moscow State Technical University** (worked on language models)

TECHNICAL SKILLS

- **Deep Learning, Deep Neural Networks, Machine Learning, Modeling;**
- I'm fluent in **Python** and I used to code in C/C++, Go, language is not a problem after all.
- I'm also fluent with common data science tools such as **NumPy, matplotlib, scikit-learn, pandas**.
- I'm comfortable with the common data science environment e.g., **bash, git, Linux**.
- My primary deep learning framework is **PyTorch**. Prior to that, I had an experience with Theano+Lasagne and TensorFlow.
- Comfortable with **GPU clusters and distributed training**.
- I have experience with **MapReduce**, Hadoop, Hive, and Spark.

THESIS CO-SUPERVISON

- [Alexander Lyzhov](#) (moved to NYU)
 - Deep Neural Network Ensembles: Analysis and Approaches to Diversification (MSc, 2020)
- [Andrei Atanov](#) (moved to EPFL)
 - Effective Learning of Deep Neural Networks Ensembles (BSc, 2018)
 - Learning Deep Models with Small Data (MSc, 2020)
- [Evgenii Nikishin](#) (moved to Mila)
 - Stability Improvement and Knowledge Transfer in Deep Reinforcement Learning (MSc, 2019)

CODE

- **Simple MVP implementations of ML algorithms:**
 - [Real NVP normalizing flows](#)
 - [Quantile Regression DQN \(Distributional RL\)](#)
 - [Equivariant GNN](#)
- **Research-ready implementations:**
 - [Multi-GPU SimCLRv1](#) closely reproduced results on both CIFAR-10 and ImageNet
 - [Ensembles](#) (Deep ensembles, Snapshot ensembles, cSGLD, FGE, etc.)

PROGRAM COMMITTEE

- Neural Information Processing Systems, NeurIPS:
 - 2019: top-50% highest-scored reviewers
 - **2021: outstanding reviewer award (top-8%)**
- International Conference on Machine Learning, ICML (2019, 2020)
 - 2020: top-33% highest-scored reviewers
- International Conference on Learning Representations, ICLR (2020, 2021)
- ICML Workshop on Invertible Neural Networks (2019, 2021, invertibleworkshop.github.io)
- Bayesian Deep Learning Workshop (since 2017, bayesiandeeplearning.org)

TEACHING

- Supervisor of reading clubs on machine learning at HSE and Yandex school of data analysis (since 2017)
- A lecture with a practical session on Normalizing Flows at DeepBayes Summer School (since 2017)
- Lecturer, Moscow Institute of Physics and Technology: I was a lecturer and manager of the deep learning brunch of a faculty-wide machine learning course ~60 students (ml-mipt.github.io). Also, I taught deep learning and practical sessions on cutting-edge ML algorithms on a facultative course "Data Mining in Action" ~ 200 students (bit.ly/3eRLGYp). The goal of this course is to make ML education available for everyone for free.