

Arsenii Ashukha

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I am a Research Scientist at [Isomorphic Labs](#) @ London (UK), where I work on AI-first drug design and understanding of human biology 🧠+🧬=💊. I did a PhD in AI/ML at [BayesGroup](#), so I can make big overcomplicated DNNs work. The results of my PhD contributed to sparsification, uncertainty estimation, ensembling, and fundamentals of Bayesian deep learning. I was a part of Samsung AI, Yandex Research, and University of Amsterdam. During my undergrad and master's, I did some ML engineering internships in deep learning for music, recommendation systems, and user modeling.

PROFESSIONAL EXPERIENCE

- 2022 Oct - now **Research Scientist, [Isomorphic Labs](#)** (Alphabet Inc.)
I work on AI-first drug design and understanding of human biology 🧠+🧬=💊.
- 2018 April - 2022 May **Research Scientist, Samsung AI Center**
I worked 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)

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

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.

CODE

- **Research-ready implementations:**
 - [LaMa Image Inpainting](#) (★2.9k)
 - [Multi-GPU SimCLRv1](#) closely reproduced results on both CIFAR-10 and ImageNet
 - [Ensembles](#) (Deep ensembles, Snapshot ensembles, cSGLD, FGE, etc.)
- **Simple MVP implementations of ML algorithms:**
 - [Real NVP normalizing flows](#)
 - [Quantile Regression DQN](#) (Distributional RL)
 - [Equivariant GNN](#)

THESIS CO-SUPERVISION

- [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)

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 (2019, links: [1](#), [2](#))
- Lecturer, Moscow Institute of Physics and Technology:
 - A lecturer and a manager of a deep learning part of ML course (ml-mipt.github.io).
 - A lecturer of DL part and an instructor of practical sessions of the *Data Mining in Action* course ([link](#)).