

To whom it may concern,

My name is Ivan Nazarov. I am 36 years old and have working experience since 2009. I have been studying and working in machine learning since 2014. During this time I have tackled industrial and applied projects, and contributed to theoretical studies, e.g. time series forecasting, data-driven optimization in operations research, radio frequency signal processing, decentralized optimization for anomaly detection, sparse matrix decompositions, variational Bayes and sparsification methods for deep learning.

In 2016 I graduated from the MSc programme on computer science at the National Research University Higher School of Economics and in 2020 I successfully completed my PhD studies on applied mathematics, computer science and engineering at Skoltech. The thesis is on the topic of model sparsification: sparse-regularized matrix decompositions, variational dropout, and parameter pruning methods based on second-order loss approximation. I have a paper about variational Dropout for complex-valued deep networks at ICML2020¹ and co-authored several other publications in other venues.²

I have advanced knowledge of python³ and, when the problem demands, develop extensions for it in C/Cython. I know how to prepare numerical experiments, incorporate them in broader scientific research, plan and carry out ablation studies, and clearly communicate the findings. I have no problem with engaging with complex concepts in probability and mathematical statistics, optimization and numerical methods, functional analysis, differential geometry and linear algebra. When doing studying and doing research I prefer to take a broad integral look at the methods, their interactions, influences and relations to adjacent machine learning subfields. I feel secure in my ability to distill and combine key ideas from diverse research fields, and I enjoy communicating ideas to others through papers, presentations and teaching.

In the last two years I have been consumed by the exciting and challenging field of Reinforcement Learning and Optimal Control, specifically hierarchical policies, planning, MCTS and adaptive computations, and our team took first place in the recent NeurIPS Nethack Challenge for our neural-algorithmic hybrid policy (Team RAPH). More recently I was captivated by the prospect of marrying classic search algorithms with the latest advances in machine and deep learning and the problem of generalizing from small problems to large ones. In particular, improving the runtime speed by practical methods to learn heuristics for Branch and Bound solvers from a collection of small Mixed Integer Program

¹<https://proceedings.mlr.press/v119/nazarov20a.html>

²<https://scholar.google.ru/citations?user=1F5HI3QAAAAJ>

³<https://github.com/ivannz>

instances with further fine-tuning on a handful of practically relevant problems within the same class.

I intend to continue pursuing research in Machine Learning and RL and I am confident that my software engineering skills, understanding of modern DEVops practices, and diligent and broad approach to research, coupled with excitement with AI in general, would allow me to make meaningful contributions both the field itself and its applications.

Thank you for your consideration,

Ivan Nazarov