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. machine learning approaches in combinatorial optimization, hierarchical reinforcement learning, time series forecasting, radio frequency signal processing, decentralized optimization for anomaly detection, sparse sparse matrix decompositions, generating steganographic containers with GANs, variational Bayes and sparsification methods for deep networks.

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. My thesis research was focused on 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 ICML2020[1] and co-authored several other publications in other venues.[2]

I have advanced knowledge of python[3] and have hands-on experience with developing extensions in C/Cython. I recognize the value of carefully prepared numerical experiments in evaluating research hypotheses, and the merit of place the results within a bigger picture. I know how to plan and carry out ablation studies, and clearly communicate and visualize the findings. When studying and doing research I prefer to take a broad integral look at the methods, track their interactions, figure out influences and relations to adjacent machine learning subfields. I have no problem with engaging with complex concepts in probability and statistics, optimization and numerical methods, differential geometry and linear algebra. I feel secure in my ability to distill and combine key ideas from diverse research fields, and enjoy communicating findings through papers, presentations and teaching materials.

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

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[1] https://proceedings.mlr.press/v119/nazarov20a.html

[2] https://scholar.google.ru/citations?user=lF5HI3QAAAAJ

[3] https://github.com/ivannz

particular, improving the runtime speed by practical methods to learn heuristics for Branch and Bound solvers from a collection of small Mixed Integer Program instances with further fine-tuning on a handful of practically relevant problems within the same class.

I intend to continue pursing 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