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## Scaling of Normalizing Flows for Lattice Gauge Theories: Automated Hyperparameter Optimization and Transfer Learning

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In this study, we present an analysis of the weak and strong scaling behaviours of normalizing flow methods applied to SU(2) and SU(3) gauge theories. We investigate the performance of these normalizing flows across varying lattice volumes and spacings, providing insights into their scalability and computational demands. Additionally, we perform an automated hyper-parameter optimization process, which facilitates efficient transfer learning of models with different lattice parameters. Our results demonstrate the potential of automated hyper-parameter optimization to enhance the robustness and adaptability of Flow-based methods

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