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Path gradient estimators for CNFs in Lattice Gauge Theory

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In recent work, we have developed continuous normalizing flows (CNFs) for lattice gauge theories. CNFs are well suited to address symmetrical problems due to the ease of implementing equivariances. We have demonstrated that CNFs can achieve state-of-the-art performance with few, but physically meaningful parameters. In this talk, I will present our results for 4d Yang-Mills theory. Our architecture can substantially outperform any other proposed model on this task but is still insufficient to scale to physically relevant coupling values and lattice sizes. Particular emphasis will be put on low variance path gradient estimators to CNF. These gradient estimators are a powerful technique for doubly stochastic variational inference. They are low variance estimators which we demonstrate to improve the performance also in the case of the CNFs applied to gauge theory.

Primary authors: VAITL, Lorenz (TU Berlin); Dr KESSEL, Pan (Prescient Design); Dr BACCHIO, Simone (CyI); Dr SCHAEFER, Stefan (DESY)

Presenter: VAITL, Lorenz (TU Berlin)