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Training Topological Samplers for Lattice Gauge Theories

Thursday, September 30, 2021 3:50 PM (50 minutes)

The ability to efficiently draw independent configurations from a general density function is a major computational challenge that has been studied extensively across a variety of scientific disciplines. In particular, for High Energy Physics, the effort required to generate independent gauge field configurations is known to scale exponentially as we approach physical lattice volumes.

We discuss ongoing developments towards developing a generalized version of the Hamiltonian Monte Carlo (HMC) algorithm that efficiently leverages invertible neural network architectures to help combat this effect, and demonstrate its success on a two-dimensional U(1) lattice gauge theory.

Our implementation is publicly available at https://www.github.com/saforem2/l2hmc-qcd

Presenter: FOREMAN, Sam (Argonne National Laboratory)

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