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On the application of gauge equivariant neural networks to the generation of field configurations

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A strategy that has been increasingly and successfully employed over the last few years in the design of neural network architectures is the implementation of layers that inherently respect a specific symmetry. In the context of lattice gauge theories, local symmetries are a crucial element. Lattice gauge equivariant neural networks (L-CNNs) [1] are designed to preserve such symmetries and have proven to be outperforming traditional convolutional neural networks in the prediction of physical observables. Here, we report our recent developments in the application of L-CNNs to the generation of gauge field configurations. Specifically, we use the framework of neural ordinary differential equations in combination with L-CNNs to modify configurations in a gauge equivariant way.

[1] M. Favoni, A. Ipp, D. I. Müller, D. Schuh, Phys.Rev.Lett. 128 (2022), 032003, [arXiv:2012.12901]

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