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Visualizing the inner workings of L-CNNs

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Lattice Gauge Equivariant Convolutional Neural Networks (L-CNNs) leverage convolutions with proper parallel transport and bilinear layers to combine basic plaquettes into arbitrarily shaped Wilson loops of growing length and area [1]. These networks provide a powerful framework for addressing challenging problems in lattice field theory.

In this talk, we explore the inner workings of L-CNNs, aiming to gain insight into the contributions of the different layers. Through visualization techniques, we analyze the patterns and structures of the Wilson loops that emerge, studying to what degree L-CNN architectures exhibit redundancy in the parameters. With our findings we aim to provide a deeper understanding of L-CNN behavior and improve its interpretability.

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

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