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Sampling lattice gauge theory in four dimensions with normalizing flows

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Flow-based models were previously successfully applied for the generation of configurations in lattice (gauge) field theories in two dimensions. In this work, we discuss further development of this approach for lattice gauge theories in four dimensions. We show several implementations and apply improvements to the approach. We study different masking patterns and choices of frozen loops, as well as improvements to the flow transformations. Also, we investigate different machine learning methods such as different architectures of neural networks and training protocols.

Authors: Dr HACKETT, Daniel (MIT); REZENDE, Danilo Jimenez (DeepMind); BOYDA, Denis (ANL, MIT); KAN-WAR, Gurtej (MIT); CRANMER, Kyle Stuart (New York University (US)); ALBERGO, Michael (New York University); Prof. SHANAHAN, Phiala (Massachusetts Institute of Technology); RACANIÈRE, Sébastien (DeepMind)

Presenter: BOYDA, Denis (ANL, MIT)

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