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Adaptive Tensor Tree Method with Annealing of Mini-batch Samples for Generative Modeling on Quantum Devices

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We proposed the Adaptive Tensor Tree (ATT) method, which uses the tensor tree network within the Born machine framework to construct a generative model. This method expresses the target distribution function as the squared amplitude of a quantum wave function represented by a tensor tree. The core concept of the ATT method involves dynamically optimizing the tree structure to minimize the bond mutual information. In this presentation, we introduce a new technique that utilizes an annealing process on mini-batch samples to enhance the performance of the ATT method. We will demonstrate the effectiveness of this new ATT approach using various datasets.

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