Think Global, Measure Local

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September 17, 2024

We prove that using global observables to train the matrix product state ansatz results in the vanishing of all partial derivatives, also known as barren plateaus, while using local observables avoids this. This ansatz is widely used in quantum machine learning for learning weakly entangled state approximations. Additionally, we empirically demonstrate that the objective function is an inner product of almost sparse operators in many cases, highlighting the potential for classically simulating such a learning problem with few quantum resources.