Towards a measureable pathway for learning quantum annealing
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work, we have proposed and developed an algorithm for quantum annealing ma-
chines, to expand their repertoire using systematic quantum control via machine
learning. Current technologies limit measurement of the states of these machines to
determination of the average spin at each site. We therefore construct a "broken
pathway" between the initial and the desired states, at each step of which the av-
erage spins are nonzero, and show successful learning of that pathway. Using this
technique we show we can direct annealing to multiqubit GHZ states and W states.
The procedure is robust to noise and decoherence.

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