

Hybrid classical-quantum linear solver running on NISQ machines

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We propose a realistic hybrid classical-quantum linear solver to solve systems of linear equations of a specific type, and demonstrate its feasibility with Qiskit on IBM Q systems. This algorithm makes use of quantum random walk that runs in $O(N \log(N))$ time on a quantum circuit made of $O(\log(N))$ qubits. The input and output are classical data, and so can be easily accessed. It is robust against noise, and ready for implementation in applications such as machine learning.