Optimization of quantum algorithms for near-term quantum computers

Bonet Monroig, X.

Stellingen

behorende bij het proefschrift

Optimization of quantum algorithms for near-term quantum computers

1. Symmetry verification provides the minimum amount of error mitigation at the lowest computational cost possible.

   Chapter 2, 3

2. A binary partition strategy allows one to sample all k-local qubit operators in an N-qubit system in poly-log(N) time.

   Chapter 4

3. Surrogate models can improve the sampling noise floor in variational quantum algorithms.

   Chapter 5

4. Cloud-based quantum computers might be successful under the edge computing paradigm.

   Chapter 6

5. The claim in Phys. Rev. Research **3**, 023092 (2021) that a symmetry-breaking ansatz in a variational quantum algorithm provides a faster convergence is not true in general.

6. The accuracy required for quantum chemistry calculations can not be achieved with variational quantum algorithms.

   D. Wecker, M. B. Hastings, and M. Troyer,
   Phys. Rev. A **2**, 042303 (2015).

7. There exist a heuristic separation between classical and quantum cost functions.

8. Quantum computing is already providing a practical computational speed-up by motivating the discovery of better classical algorithms.

9. Academic ability is just one of many forms of intelligence, yet it is not the most important one.

Xavier Bonet-Monroig

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