

The 1st International Workshop on

QUANTUM RESOURCE ESTIMATION QRE2019

22 June, Phoenix, Arizona

co-located with International Symposium on Computer Architecture (ISCA) 2019

CALL FOR PAPERS

Quantum computation has a growing number of promising application areas such as quantum chemistry, quantum optimisation and finance. However, the first industrially relevant and scalable quantum computer seems to be at least a decade away. Therefore, one of the most pressing questions is "**How many physical qubits and how much time is necessary to execute a quantum algorithm on a selected hardware platform where the algorithmic output is more important than the fact a quantum computer was used to calculate it?**"

The workshop will bring together researchers to discuss new methods and directions needed to develop, as soon as possible, the tools to:

- accurately analyze and benchmark complex quantum algorithms
- adapt error-correction techniques
- refine classical control and hardware microarchitectures
- enable scientifically and commercially relevant quantum applications

Research papers, tutorials, software and other demonstrations, and work-in-progress reports are within the scope of the workshop. Invited talks by leading international experts will complete the program. Contributions on all areas of quantum performance analytics are welcome:

- High level quantum circuit analytics.
- Fault-tolerant quantum circuit analytics.
- Clifford+T optimisation strategies.
- Resource efficient surface code implementations.
- Surface code decoders.
- Practical quantitative analysis of surface code alternatives.
- Noisy Intermediate Scale Quantum (NISQ) evaluation.

Upon acceptance of an extended abstract (approx. 2 pages), researchers are invited to submit full research papers (maximum 12 pages), as well as work-in-progress or tool demonstration papers (maximum 6 pages). Accepted full papers will be published in a new journal - IEEE Transactions on Quantum Engineering.

Extended Abstract Submission: 21 April 2019

Notification Extended Abstract: 12 May 2019

Workshop Date: 22 June 2019

Full Paper Submission: 1 August 2019

Notification of Full Paper: (tentative) 1 November 2019

Publication of Full Paper: (tentative) 1 January 2020

Invited Speakers (more to be announced):

Naomi Nickerson - PsiQ

Joseph Fitzsimons - Horizon Quantum

Michael Bremner - University of Technology, Sydney

Craig Gidney - Google

