THE UNIVERSITY OF CHICAGO | **DEPARTMENT OF STATISTICS**

MASTER'S THESIS PRESENTATION

PEDRO HENRIQUE VIERIA DE LIMA VELOSO

Department of Statistics
The University of Chicago

Distributed Quantum Computation via Multi-objective Optimization

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ABSTRACT

Quantum Computing is a technology that will have a substantial impact in many different fields. One of the challenges in the current stage of its technical maturity is the short duration of time through which we can run applications confidently. In addition, the probabilistic nature of Quantum Mechanics implies the need to employ our best effort to maximize the probability of getting a correct answer to each algorithm run on a Quantum Computer. We propose a data-driven distributed approach that derives a set of optimal weights for different machine runs based on a multi-dimensional optimization problem to achieve that. Our results show a consistent gain of expected performance across all the dimensions in 4 distinct classes of Quantum Algorithms.