

ASU Quantum Information Processing Seminar Series Fall 2021

Trapped Ion Quantum Computing and Quantum Approximate Optimization Algorithm for MaxCut Problem

Wednesday, October 27, 2021, 10:00 AM (AZ time)

Via Zoom: <https://asu.zoom.us/j/85469430501?pwd=SWZjVzNCbIZaQXdoaWNXSWpvSDErdz09>

Password: 94025

Abstract

Quantum information processing (QIP) is moving into a new era where quantum computers are starting to approach the limits of classical computing. Quantum supremacy, quantum error correction, and several applications of Variational Quantum Eigensolver (VQE) have been demonstrated in different platforms. Here I will introduce the trapped ion system, one of the leading platforms for quantum computing. I will talk about the fundamental and technical challenges in the system and what we can expect from the trapped ion system in the near future. The second part will introduce our recent progress on the quantum approximate optimization algorithm (QAOA) for solving the MaxCut problem. We extend the previous work (arXiv:1812.04170 (2018)) to show the parameter transferability between random weighted graphs. We show that QAOA could outperform the Goemans-Williamson algorithm for a 24-vertex random weighted graph using the parameters transferred from a 10-vertex graph within hundreds of shots on a quantum computer.

Bio

Dr. Ye Wang is a research scientist working at Duke Quantum Center (DQC). He got his bachelor's degree in computer science at Tsinghua University, advised by Andrew C.C. Yao. After that, he decided to spend his Ph.D. time building a quantum computing prototype at Tsinghua University and then came to the DQC three years ago.

Dr. Ye's research focuses on understanding the noise of quantum devices and pushing devices to their performance limits. During his Ph.D. studies, he led the experiment extending the coherence time of a single qubit from tens of seconds to 10 minutes. At DQC, he demonstrated the highest quality entangling gates in a qubit chain. He is currently leading the team to implement these high-quality gates to a larger system. As an experimental physicist, Ye is committed to making the best quantum computer based on the trapped atomic ion system and using quantum computers to solve problems that have practical implications.



Dr. Ye Wang

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