Quantum Science & Engineering Center

Quantum Computing Seminar Series

GEORGE MASON UNIVERSITY

Dr. Ying Mao

Assistant Professor, Fordham University

Deep Learning Models with Quantum State Fidelity and Beyond

Monday, October 17, 2022 | 12:30–1:30pm | Zoom

Abstract

Remarkable progress has been achieved in deep learning related systems and applications. In the post Moore's Law era, however, the limit of semiconductor fabrication technology and the increasing data size have slowed down the development of learning algorithms. In parallel, the rapid development of quantum computing has pushed classical system designs into a new era. We propose novel architectures with quantum-state-fidelity-based evaluation functions to train deep learning models. The new designs encode the data with a reduced number of qubits and generate the quantum circuit, pushing it to the quantum machines for the best states iteratively. We conduct intensive experiments on both quantum simulators and the IBM-Q quantum platform.

Additionally, we compare IBM-Q results with IonQ as they are the two leading qubit implementations for quantum information processing at scale and have complementary characteristics. Finally, we will discuss the challenges and opportunities to develop quantum-based systems and applications further.

Meeting Information: https://go.gmu.edu/qcseminar

About the Seminar Series

The Quantum Computing Seminar Series are a series of working seminars organized and hosted by QSEC's quantum computing subgroup on Mondays. These events are free and open to the public. More information is available on QSEC's Computing Events and Mathematical Sciences Department's Quantum Computing Seminars. For any questions, contact qsec@gmu.edu.