



# Milad Marvian

University of New Mexico

Center for Quantum Information and Control

## Quantum Earth Mover's Distance: A New Approach to Learning Quantum Data

**Monday, March 28, 2022 | 11–12pm | Zoom**

### Abstract

Quantum computers can be more powerful than classical computers in certain computational tasks. Given the fundamentally different nature of quantum systems compared to classical systems, developing suitable mathematical tools can help us to understand the capabilities and limitations of quantum computers. In this talk, I will introduce a generalization of the earth mover's distance to the set of quantum states. The proposed distance recovers the Hamming distance for the vectors of the canonical basis, and more generally the classical earth mover's distance for quantum states diagonal in the canonical basis. I will show how the desirable properties of this distance make it suitable for learning quantum data using quantum generative adversarial networks.

### Meeting Information

<https://gmu.zoom.us/j/93426209769?pwd=TjNmYWpvMIYxRzZGUkNzeHdPV2g3QT09>

### 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](mailto:qsec@gmu.edu).