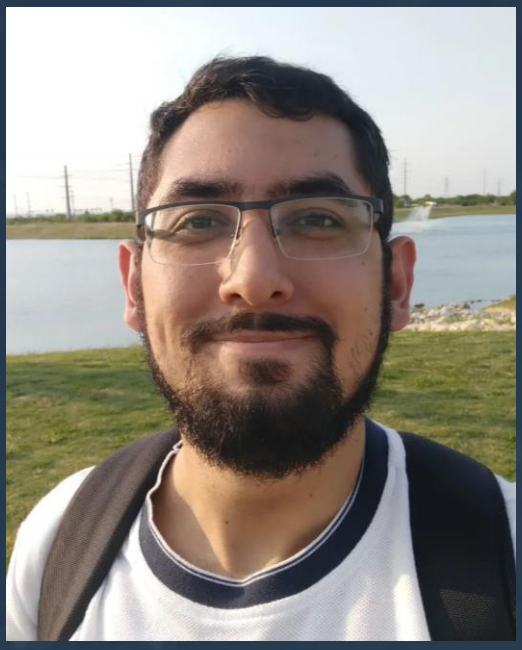
RICE QUANTUM GROUP MEETING SEMINAR SERIES

Non-convex optimization in Quantum Process Tomography



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David Quiroga is a PhD student in Computer Science at Rice University researching quantum process tomography and variational quantum algorithms using non-convex optimization. He received his B.Eng. in Computer Science Engineering at Universidad de Antioquia in Colombia and has been a research intern at Oak Ridge National Laboratory and Georgia Tech Research Institute, working on clustering using quantum computers and variational linear solvers.

October 20th, 2024
12 – 1:30 PM
SST 300

ABSTRACT

We propose a non-convex optimization algorithm based on the Burer-Monteiro (BM) factorization for quantum process tomography on near-unitary quantum gates. Our algorithm uses a reduced set of initial states and measurement operators for both a complete measurement setting and an underdetermined setting. Our findings show that our algorithm converges faster and achieves higher fidelities than state of the art, both in terms of measurement settings, as well as in terms of noise tolerance, in the cases of depolarizing and Gaussian noise models.

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