Computer Science
Seminar

On the Analysis of Entanglement Distribution in a Quantum Network

Gayane Vardoyan

Abstract: Entanglement is an essential component of quantum computation, information, and communication. Its applications range from quantum key distribution and secret sharing to quantum sensing. These applications drive the increasing need for a quantum switching network that can supply end-to-end entangled states to groups of endpoints that request them. To this end, I study a quantum switch that distributes entanglement to users in a star topology. I will present models for variants of this system and derive expressions for switch capacity and the expected number of qubits stored in memory at the switch. Much of this work focuses on bipartite entanglement switching. For this case, I will discuss how performance metrics are affected by decoherence and link heterogeneity. In this talk, I will also discuss a work wherein we explore a set of switching policies for a switch that can serve both bipartite and tripartite entangled states. I will conclude the talk with a discussion of future research directions and a long-term vision of leveraging tools from performance evaluation to analyze and help guide the design of future quantum networks.

Wednesday, March 25, 2020, 11:30 am
https://emory.zoom.us/j/702927079

Computer Science
Emory University