

Title:

Quantum walk assisted combinatorial optimization

Abstract:

Combinatorial optimization problems are known to be notoriously difficult to solve, even approximately. In this talk, we will present a general framework for performing continuous-time quantum walks over feasible solutions to a wide range of combinatorial optimization problems, which works by 'steering' the quantum amplitude into high-quality solutions. Prior work in this area has involved painstakingly designing a unique 'mixer' separately for each combinatorial problem under consideration. In contrast, we will describe a novel way to find a highly efficient quantum circuit that performs continuous-time quantum walks for a wide class of optimization problems.