

Solving Hard optimization problem with Quantum computer

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This talk presents an example of using Quantum computer to perform a standard optimization task. Traveling Salesman Problem is a widely used problem that represents hard problem for optimization. To use Quantum computer for this task, we devise quantum circuits using it in hybrid with traditional computer.

We propose a quantum-assisted compact genetic algorithm that uses a quantum amplitude amplification technique in the selection process. We apply the algorithm to the traveling salesman problem on IBM Qiskit simulator to show how one would construct the quantum circuit and how to encode the optimization problem into quantum states. We also pointed out the limitation of the current technology.