

Quantum Annealing: comparison on different platforms

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I. INTRODUCTION

Quantum computing is an up and coming technology which has gained a lot of potential and advancement in recent times. With companies like IBM, D-Wave, Google etc. allowing public access to quantum computing resources and limitation on different approaches, there are numerous different algorithms and use cases that can be implemented and quantum supremacy over classical computing be achieved. I accessed different platforms and approaches of quantum computing. Since gate based quantum computing has limited number of quantum bits or qubits, I was particularly interested in quantum annealing approach.

Through out the paper, I talk about the general concept of quantum annealing, how is it implemented and sample problems on D-Wave's quantum computer and other universal quantum quantum computers that allow quantum annealing. Due to the difference in nature of quantum bits in different approach and technology used by different companies, there are different number of qubits for different systems.

Section 1 describes what are different approaches to quantum computing. Section 2 and 3 shows how quantum annealing works and how it can be used for different use case. Section 4 shows application example on D-Wave systems and possible implementation on other computers that are in development and were infeasible during the time. Section 5 compares the outcome and future implementations are suggested.

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