

Why Quantum Machine Learning Matters

DL-2 Red

Design Document

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Design Methodology Description

The methodology of this research project aims to study and implement a quantum computing approach to solve an NP-hard problem. Our architecture begins by identifying potential NP-hard problems where its classical approaches for the chosen NP-hard problem can be improved upon by existing or novel quantum algorithms. To achieve this, we aim to develop a foundation of understanding of the problem set and the necessary quantum computing fundamentals needed to devise an improved quantum algorithm. Next would be the algorithm development stage. In this phase we aim to create and optimize a quantum algorithm tailored to the specific NP-hard problem. Simulation and testing will then be conducted to define the algorithm's performance and ensure its correctness. Further observations can be concluded from these tests to deduce any improvements the quantum algorithm gives compared to previous classical computing approaches such as differences in execution time, accuracy, resource utilization, etc. Lastly, our research will be documented and reported to detail any findings gained throughout researching quantum computing algorithms.

Design Methodology Flow Diagram

