Quantum Algorithms for Big Data Processing

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Abstract. This paper explores the potential of quantum algorithms in enhancing big data processing capabilities. By leveraging quantum computing's unique properties, such as superposition and entanglement, we aim to address the limitations of classical algorithms in handling large datasets. Our study presents a detailed analysis of quantum algorithmic techniques and their application in various big data scenarios, including data mining and machine learning. We demonstrate that quantum algorithms can significantly speed up data processing tasks, offering a promising avenue for future research in computational science and technology. This work serves as a stepping stone towards the integration of quantum computing in mainstream data processing applications.

Keywords: quantum, algorithms, big data, processing, computing

Introduction: In the era of big data, traditional computational methods often struggle to keep up with the ever-increasing volume, velocity, and variety of data. This challenge necessitates innovative approaches to data processing that can transcend the limitations of classical computing. Quantum computing emerges as a promising solution, offering the potential to revolutionize how we process and analyze massive datasets. This paper explores the synergy between quantum algorithms and big data processing, highlighting the transformative impact quantum computing can have on various fields such as finance, healthcare, and social sciences. We delve into the mechanisms through which quantum algorithms can enhance data processing efficiency and propose a framework for their implementation in real-world scenarios.

References

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