Quantum Computing in Modern Computational Systems

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Abstract. This paper examines the role of quantum computing in modern computational systems, focusing on its potential to solve complex problems more efficiently than classical computing. The study explores current advancements in quantum technologies and their applications in various fields, highlighting both the opportunities and challenges presented by this emerging technology.

Keywords: quantum computing, quantum algorithms, qubits, cryptography, optimization

Introduction

Quantum computing represents a paradigm shift in computational systems, offering new possibilities for solving complex problems that are intractable for classical computers. This paper explores the principles of quantum computing and its integration into modern computational systems. We discuss recent advancements in quantum technologies, including qubit development, quantum algorithms, and error correction. The potential applications of quantum computing in fields such as cryptography, optimization, and material science are examined. Additionally, the paper addresses the challenges associated with quantum computing, such as hardware limitations and algorithmic complexities. By providing a comprehensive overview of quantum computing, this study aims to inform future research and development in this area.

References

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