Introduction

This thesis explores the effects of quantum computing on modern cryptography. The implications are significant for future security systems.

Background

Quantum mechanics provides the foundation for quantum computing[1].

- Superposition allows qubits to exist in multiple states
- Entanglement enables correlated quantum states
- Quantum interference enables computational speedups

$$E = mc^2 \tag{1}$$

The famous equation Equation 1 demonstrates mass-energy equivalence.

Algorithm	Classical	Quantum
Factoring	O(exp)	O(poly)
Search	O(N)	O(√N)

Table 1: Comparison of algorithmic complexity

As shown in Table 1, quantum algorithms provide significant speedups.

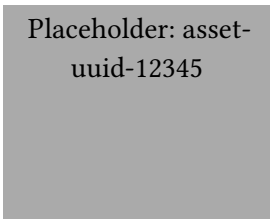

Figure 1: Quantum Circuit Diagram

Figure 1 illustrates the basic quantum circuit structure.

Conclusions

This chapter has introduced the fundamental concepts of quantum computing. The following chapters will explore practical applications.

[1] See Appendix A for mathematical foundations.