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(57) Abstract :
QUANTUM-ENHANCED AUTONOMOUS THREAT DETECTION AND RESPONSE SYSTEM LEVERAGING FEDERATED DEEP LEARNING AND MULTI-LAYER BEHAVIORAL ANALYTICS ABSTRACT The present invention discloses a quantum-enhanced autonomous threat detection and response system (100) designed to improve the speed and accuracy of identifying and mitigating security threats in distributed networks. The system comprises a federated deep learning module (102) that aggregates and trains machine learning models across decentralized datasets without sharing raw data, and a quantum processing unit (QPU) (104) to enhance computational performance. A multi-layer behavioral analytics engine (106) analyzes user, system, and network behavior to detect anomalies. The threat detection module (108) identifies security threats by comparing behavioral data and federated model outputs. A response engine (110) autonomously generates real-time mitigation strategies, including alert generation, network segmentation, and automated countermeasures. The system also includes a communication interface (112) for transmitting updates across the federated nodes. This approach leverages federated deep learning, quantum computing, and multi-layer analytics to enhance the detection and prevention of emerging threats in real-time.

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