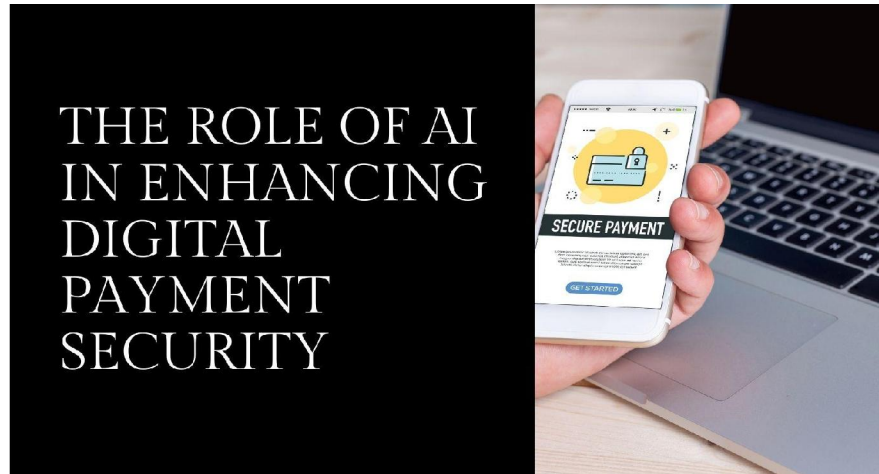# The Role of AI in Enhancing Digital Payment Security

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Abstract: *This article explores how Artificial Intelligence enhances payment system security through adaptive defense mechanisms. Beginning with an overview of digital payment evolution from basic transfers to complex ecosystems including mobile wallets, peer-to-peer applications, cryptocurrencies, and embedded financial services, it identifies heightened security challenges in this expanded landscape. The core focus explores AI-driven security solutions including machine learning for fraud detection, behavioral biometrics for continuous authentication, natural language processing for transaction monitoring, and computer vision for document verification. The discussion extends to predictive analytics that enable threat forecasting through temporal pattern analysis, network effect modeling, and dark web intelligence gathering. The article also addresses real-time threat mitigation through adaptive authentication, nuanced transaction intervention strategies, and adversarial defense mechanisms while acknowledging challenges in data quality, model explainability, and regulatory compliance. Future directions highlight emerging technologies such as federated learning, quantum-resistant cryptography, AI-powered digital identity frameworks, and neuromorphic computing applications that promise to reshape payment security.*

Keywords: Artificial Intelligence, Authentication, Biometrics, Cryptography, Fraud Detection