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Gen AI in Financial Cybersecurity: A Comprehensive Review of Architectures, Algorithms, and Regulatory Challenges

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ABSTRACT

This paper provides a comprehensive review of the intersection of cybersecurity, generative AI, and risk within the financial sector. We explore how AI is being leveraged for both defensive and offensive purposes, the emerging threats posed by GenAI, and the critical need for robust risk management frameworks and regulatory guidance. This paper reviews the intersection of cybersecurity, generative artificial intelligence (AI), and risk management in the financial sector. We examine the dual role of AI as both a tool for enhancing cybersecurity defenses and a vector for sophisticated cyber threats. The paper analyzes regulatory responses, emerging best practices, and the evolving threat landscape, with particular attention to generative AI's impact on financial

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