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EVALUATING THE EFFICACY OF ASYMMETRIC IMAGE ENCRYPTION TECHNIQUES

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ABSTRACT

In an era where digital imagery is ubiquitously utilized across multiple domains, securing image data has become paramount. Asymmetric image encryption techniques, utilizing public and private key mechanisms, present a sophisticated approach to safeguarding image confidentiality and authenticity. This study explores various asymmetric encryption methodologies, focusing on their implementation in image security. Key algorithms such as RSA and Elliptic Curve Cryptography (ECC) are examined for their effectiveness in encrypting and decrypting image data. The paper delves into the technical intricacies, comparative performance analysis, and the resilience of these techniques against diverse cryptographic attacks. Empirical evaluations highlight the trade-offs between encryption strength and computational efficiency. Additionally, the practical implications and potential integration of these techniques in real-world applications, such as secure image transmission in telemedicine and encrypted storage in cloud environments, are discussed. This comprehensive review aims to elucidate the advantages and limitations of asymmetric image encryption, providing a roadmap for future research and development in this critical area of cybersecurity.