

# Text and Image Encryption using ECC

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**Abstract:** This project combines Elliptic Curve Cryptography (ECC) with Random Matrix Cryptography (RMC) for image encryption and ECC with the Lorenz algorithm to provide a comprehensive solution to data security. Chaotic equation for text encryption. While ECC-Lorenz uses chaotic dynamics for text encryption, ECC-RMC uses matrix operations to strengthen image encryption. The efficacy of both strategies in safeguarding the confidentiality and integrity of transmitted data is demonstrated through experimental validation, which therefore improves network communication security. A multi-layered encryption architecture is established by the integration of ECC-RMC and ECC-Lorenz, providing a strong defense against cyber attacks and unlawful access. This new encryption paradigm promises improved resilience in digital information transfer, marking a significant leap in data security measures. The suggested method gives a flexible way to combine computational complexity and mathematical rigor.

**Keywords:** Elliptical curve cryptography(ECC),Random matrix cryptography(RMC),ECC-Lorenz Algorithm, Chaotic equations