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AI/ML-Assisted Cryptanalysis: A Deep Learning Approach to Cipher Pattern Detection

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Abstract: *This study investigates the use of deep learning models Fully Connected Neural Networks (FCNN), Convolutional Neural Networks (CNN), and Recurrent Neural Networks (RNN)to detect patterns in encrypted data. Through 11 trials, we demonstrate that ML can identify plaintext types and weak ciphers (e.g., SHIFT, XOR) but fails against robust ciphers like AES, DES, and One-Time Pad (OTP) when properly keyed. The findings underscore MLs potential to augment cryptanalysis and the need for AI-aware encryption designs to counter evolving threats.*

Keywords: Cryptanalysis, Machine Learning, Neural Networks, AES, DES, SHIFT, XOR, OTP

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