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Data Encryption Approach Using Hybrid Cryptography and Steganography with Combination of Block Ciphers

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Abstract

Information security has been one of the prominent fields due to the concerns regarding it, for the past few decades. Any loopholes in these may lead to dire consequences depending upon the importance of the message being transmitted. Thus there have emerged many techniques for this purpose, one such is crypto steganography which has been implemented in this paper, our algorithm uses a combination of Advanced Encryption Standard (AES) and columnar block ciphers to encrypt message and embedding it into the image using 1-Least Significant Bit (1-LSB) method and the reverse is done to get the data back at the other end. Hence this algorithm adds another layer of security with strong encryption techniques while maintaining the structure of the image. There is low distortion in the image with Mean Squared Error (MSE) as 0.028, Peak Signal-to-Noise Ratio (PSNR) as 63.719 and Structural Similarity Index (SSIM) values as 0.999 for png image and 0.044, 61.728, 0.999 respectively for bmp image. © 2022, The Author(s), under exclusive license to Springer Nature Switzerland AG.

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