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Articles

Sparse Compression-Based Image Encryption using Data Encryption Standards RC5

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Abstract

In this work, we have used the standard symmetric key block cipher data encryption algorithm RC5(32,16,8) for the encryption of digital greyscale images. For this, we have only considered the nonzero elements of the sparse matrix of the images which have been generated using the sparse representation technique. The security strength of the proposed technique is verified through different quality parameters, *e.g.* information entropy, correlation coefficients, NPCR, UACI, and NIST test. Our proposed algorithm achieved the maximum information entropy value of 7.9977 for the cameraman image and nearly zero correlation coefficient values establish the robustness of the cryptosystem. The highest NPCR and UACI values obtained in our work are 99.6916 and 33.9605, which are closer to the maximum theoretical values. The proposed technique is also compared with some of the contemporary works to validate the credibility of our proposed algorithm.

KEYWORDS: Sparse representation Data compression Dictionary learning RC5 encryption Symmetric block Cipher

Disclosure statement

No potential conflict of interest was reported by the author(s).

Additional information

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