Abstract

This paper presents a new implementation of a hybrid ciphering system of images in Fourier domain based on two chaotic maps. The first map is the Bakermap, which is used to scramble the image pixels in three modes of operation (CBC, CFB and OFB). The second map is the logistic map, whose secret key depends on the plain text. In the key generation step of the logistic map, the chaotic stream is generated with plain text and hence the relation between the key and the plain text is established. We use Fractional Fourier Transform (FrFT) before the encryption to achieve a large degree of randomization. We examine the proposed algorithm and compare the results with the RC6 algorithm. The performance and security analysis prove that this hybrid ciphering system is efficient, reliable, and can effectively resist different attacks.

References

Hybrid Ciphering System of Images based on Fractional Fourier Transform and Two Chaotic Maps

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Index Terms
Keywords

Baker map  Fourier transform  Logistic map  Modes of operation  and Security analysis.