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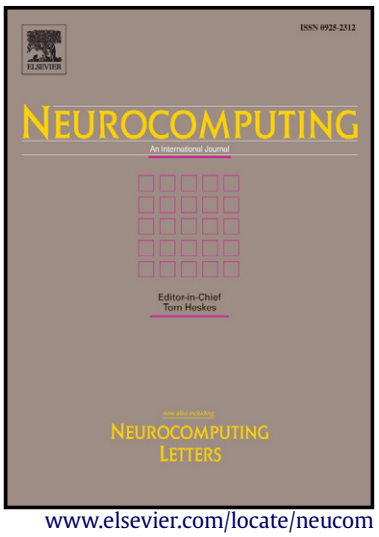

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ACCEPTED MANUSCRIPT

A novel image encryption algorithm based on chaos and Line map

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Abstract

In the age of big data, border of data security has become increasingly blurred. Our privacy security is facing a new round of test. The multimedia big data especially images often carry many secrets or privacy information. How to ensure safety and ensure the authorization of accessing to confidential data authorization, becomes a hot problem of urgent in image information processing and transmission. In this paper, we propose a novel symmetrical image encryption algorithm based on skew tent map. Utilizing a new chaos based Line map, the proposed algorithm is suitable for encryption of any size of image. In order to disrupt the correlations between the R, G, B components of the true color image, these three components are encrypted at bit level and operated at the same time. The proposed algorithm realizes fast encryption and decryption of both gray-scale image and color image. In addition, the algorithm can be implemented parallel because there is no complex sub-block processing operation. Results of various analyses and numerical simulations show that the new algorithm has high security and is suitable for practical image encryption.

Keywords: Image encryption, Skew tent map, Line map

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