Abstract

Advanced image encryption schemes for secure transmission and storage are increasingly needed for a number of applications like medical, military, satellite etc. In this paper, a novel image encryption algorithm based on Logistic and Tinkerbell map is proposed. The proposed method uses two 1-D Logistic maps with different keys and one 2-D Tinkerbell map. The chaotic sequence generated is mixed sequence from the X and Y sequences of Tinkerbell map depending on the chaotic sequences of two logistic maps. The main advantage of such a scheme is complex chaotic behavior of the generated chaotic sequences. The security and performance of the proposed method is analyzed thoroughly by using key-sensitivity, key-space, statistical, entropy, differential and performance analysis. The proposed approach achieves the required level of security with only one round of encryption operation. Hence the proposed method is computationally efficient.

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Index Terms

Computer Science  Security

Keywords

Image encryption  Logistic map  Mixed maps  Tinkerbell map