Image encryption using 2D Logistic-adjusted-Sine map

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Abstract With complex properties of ergodicity, unpredictability and sensitivity to initial states, chaotic systems are widely used in cryptography. This paper proposes a two-dimensional Logistic-adjusted-Sine map (2D-LASM). Performance evaluations show that it has better ergodicity and unpredictability, and a wider chaotic range than many existing chaotic maps. Using the proposed map, this paper further designs a 2D-LASM-based image encryption scheme (LAS-IES). The principle of diffusion and confusion are strictly fulfilled, and a mechanism of adding random values to plain-image is designed to enhance the security level of cipher-image. Simulation results and security analysis show that LAS-IES can efficiently encrypt different kinds of images into random-like ones that have strong ability of resisting various security attacks. (C) Elsevier Inc. All rights reserved.

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