A new 1D chaotic system for image encryption

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Abstract

This paper introduces a simple and effective chaotic system using a combination of two existing one-dimension (1D) chaotic maps (seed maps). Simulations and performance evaluations show that the proposed system is able to produce many 1D chaotic maps with larger chaotic ranges and better chaotic behaviors compared with their seed maps. To investigate its applications in multimedia security, a novel image encryption algorithm is proposed. Using a same set of security keys, this algorithm is able to generate a completely different encrypted image each time when it is applied to the same original image. Experiments and security analysis demonstrate the algorithm's excellent performance in image encryption and various attacks. (C) 2013 Elsevier B.V. All rights reserved.

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