A new 1D chaotic system for image encryption

By Zhou, YC (Zhou, Yicong) [1]; Bao, L (Bao, Long) [1]; Chen, CLP (Chen, C. L. Philip) [1]

Source SIGNAL PROCESSING
Volume: 97 Page: 172-182
DOI: 10.1016/j.sigpro.2013.10.034

Published APR 2014
Indexed 2014-04-01

Document Type Article

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.

Keywords Author Keywords: Chaotic system; Image encryption; Security analysis; Chosen-plaintext attack
Keywords Plus: ALGORITHM; SCHEME; SYNCHRONIZATION; CRYPTANALYSIS

Author Information Corresponding Address: Zhou, Yicong (corresponding author)
Addresses:
1 Univ Macau, Dept Comp & Informat Sci, Macau 999078, Peoples R China
2 E-mail Addresses: yicongzhou@umac.mo

Categories/Classification Research Areas: Engineering
Citation 4 Electrical Engineering, Electronics & Computer Science

Web of Science Categories Engineering, Electrical & Electronic

Funding

[Notes: The text is from a web page with some interactive elements, such as buttons for full text at publisher, export, and add to marked list.]