

A User Interface for Easiest Way Image Encryption with Chaos

Authors : D. López-Mancilla, J. M. Roblero-Villa

Abstract : Since 1990, the research on chaotic dynamics has received considerable attention, particularly in light of potential applications of this phenomenon in secure communications. Data encryption using chaotic systems was reported in the 90's as a new approach for signal encoding that differs from the conventional methods that use numerical algorithms as the encryption key. The algorithms for image encryption have received a lot of attention because of the need to find security on image transmission in real time over the internet and wireless networks. Known algorithms for image encryption, like the standard of data encryption (DES), have the drawback of low level of efficiency when the image is large. The encrypting based on chaos proposes a new and efficient way to get a fast and highly secure image encryption. In this work, a user interface for image encryption and a novel and easiest way to encrypt images using chaos are presented. The main idea is to reshape any image into a n-dimensional vector and combine it with vector extracted from a chaotic system, in such a way that the vector image can be hidden within the chaotic vector. Once this is done, an array is formed with the original dimensions of the image and turns again. An analysis of the security of encryption from the images using statistical analysis is made and is used a stage of optimization for image encryption security and, at the same time, the image can be accurately recovered. The user interface uses the algorithms designed for the encryption of images, allowing you to read an image from the hard drive or another external device. The user interface, encrypt the image allowing three modes of encryption. These modes are given by three different chaotic systems that the user can choose. Once encrypted image, is possible to observe the safety analysis and save it on the hard disk. The main results of this study show that this simple method of encryption, using the optimization stage, allows an encryption security, competitive with complicated encryption methods used in other works. In addition, the user interface allows encrypting image with chaos, and to submit it through any public communication channel, including internet.

Keywords : image encryption, chaos, secure communications, user interface

Conference Title : ICCSP 2015 : International Conference on Communications and Signal Processing

Conference Location : Paris, France

Conference Dates : April 27-28, 2015