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Enhanced Blowfish Algorithm for Image Encryption Based on Chaotic Map

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- I. Introduction
- II. Quadratic Mapping
- III. Blowfish Algorithm
- IV. The Proposed Method
- V. Experimental Results

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Abstract: Image security is essential, topic through the increase of the image usage in most of communications besides assures information security which is hidden in these images such as military and medical images. Blowfish is outstanding symmetric cryptography, which has the benefits of strong ability to resist attackers. Thus it is widely used in data encryption, but it is not suitable for image encryption because of the huge data, higher redundancy and toughly correlation of image pixels. The proposed enhanced method has been employed Blowfish based image encryption technique. Firstly the digital image is decomposed into several key-based blocks randomly to decorrelated the relationship between original and processed image then each block is passed through the Blowfish algorithm. The proposed system is designed to take advantage of the powerful ability, which is supported by a chaotic map resulting in a much-improved security/performance trade-off. As a result, the proposed system offers good performance for image encryption. To ensure improved Blowfish encryption algorithm, the implementation of

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both techniques has been carried out for experimental purposes which are showed that the original image has a flat histogram after encrypted, a decreasing correlation between adjacent pixels in all colour components and increasing entropy for the cases studied. A comparative study with previous Blowfish algorithm shows the superiority of the modified algorithm.

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Contents

I. Introduction

Computer networks have changed how people communicate at present. For example, people can now easily transfer various multimedia files through networks. Among information vectors in multimedia communication, the digital image is one of the greatest significance. Image communication plays a crucial role in information transmission. Accordingly, image encryption has been drawing increasing attention. Conventional algorithms of encryption, such as Twofish, RC6, AES, Blowfish and other symmetric ciphers that were developed for textual information are unsuitable for image encryption because of the certain inherent characteristic of images, such as high pixel correlation and redundancy. Consequently, novel image encryption algorithms are urgently required [1] [3].

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