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An Efficient System for Encrypted Image by Using Hybrid DWT-DCT Compression Algorithm

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Abstract— There has been lot of development in the field of multimedia and network technologies. With the development of multimedia and network technologies, the security of multimedia system becomes most important part in the internet when the data is transmitted over the network. If encryption is not performed then there may be possibility of stealing the information. Image compression is also essential where images need to be stored, transmitted or viewed quickly and efficiently. Therefore, there is need of system where encryption is done prior to the image compression. This paper proposed an image encryption method that is operated with Arnold transform method and image compression algorithm using Daubechies wavelet transforms and discrete cosine transform that can be used efficiently to compress the encrypted image.

Keywords— Encryption, Compression, Daubechies, Permutation, DWT, DCT

I. INTRODUCTION

In recent years, compression of encrypted data has attracted considerable research interest. The traditional way of securely and efficiently transmitting redundant data is to first compress the data to reduce the redundancy, and then to encrypt the compressed data to mask its meaning. At the receiver side, the decompression and decryption operations are orderly performed to recover the original data [1]. However, in some application scenarios, a sender needs to transmit some data to a receiver and hopes to keep the information confidential to a network operator who provides the channel resource for the transmission. That means the sender should encrypt the original data and the network provider may tend to compress the encrypted data without any knowledge of the cryptographic key and the original data. At receiver side, a decoder integrating decompression and decryption functions will be used to reconstruct the original data. Hence, image security/protection from unauthorized access becomes very important [2, 3]. Image Encryption refers to converting an image to such a format, so that it becomes unreadable to unauthorized access and can be transmitted securely over the internet. Image Decryption means to convert the unreadable format of an image to an original image. An image compression system consists of processes leading to compact representation of an image, so as to reduce total storage/transmission requirements [4].

This paper is a step forward in this regards. The rest of this paper is organized as follows: section 2 contains comprehensive clarification of the proposed system; the results for the proposed system and the conclusions, is given in sections 3 and 4, respectively.

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