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# A REVIEW PAPER ON SECURE IMAGE TRANSMISSION THROUGH DATA HIDING METHOD

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***Abstract***

*This paper introduces a new framework that combines the regulation of quality access and the monitoring of the unlawful sharing of digital images on a single platform. The objective is accomplished by (1) modulating some of the useful compressed data coefficients of the Discrete Cosine Transform (DCT) followed by (2) adding a binary watermark (fingerprint) as tracking information using Quantization Index Modulation (QIM). The method of data modulation serves the function of access control in order to prevent an unauthorized user from enjoying the correct visual quality. The embedded watermark, on the other hand, monitors illegal distribution. The modulated coefficients are selected pseudo-randomly using a hidden key (K). The watermark is encoded prior to embedding by applying convolution coding that recognizes colluder(s) involved in time-varying (intelligent) collusion activity reliably. The results of the simulation showed that the above statements were correct without affecting compatibility with the standard JPEG coding scheme.*

***Keywords:*** *Discrete Cosine Transform (DCT), Encryption, Image, Image Transmission, Quantization index.*

## I. INTRODUCTION

Wide use of computer networks enables gross distribution of digital media such as text, image, audio and video signals via World Wide Web (WWW) in a cost-efficient manner. The sale of high value products and services through the Internet is also on the rise. However, lack of security in the communication network may discourage vendors to distribute digital data through this open system [1]. The reason is quite simple, as digital media can be accessed illegally, tampered and redistributed violating commercial rules [2].

**Figure 1: Illustrates the Real Images and Encrypted Image**

## II. SECURE IMAGE TRANSMISSION THROUGH DATA HIDING METHOD

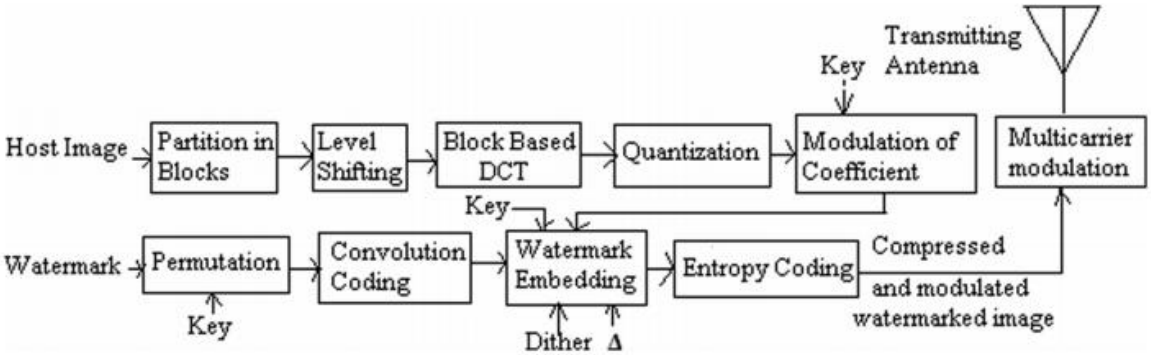


**Figure 2: Illustrates the block diagram of data hiding procedure: Encoder** [3]

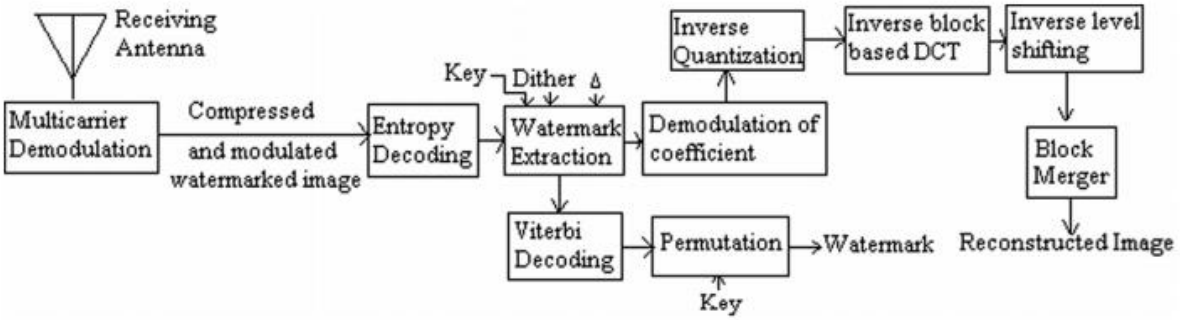


**Figure 3: Illustrates the block diagram of data hiding procedure: Decoder** [4]

$$E(x) = \frac{1}{N}\sum_{i=1}^{N} x_i$$

$$D(x) = \frac{1}{N}\sum_{i=1}^{N} (x_i - E(x))^2$$

$$cov\ (x,y) = \frac{1}{N}\sum_{i=1}^{N} (x_i - E(x))\ (y_i - E(y))$$

$$r_{xy} = \frac{cov\ (x,y)}{\sqrt{D(x)}\sqrt{D(y)}}$$

$$\sqrt{D(x)} \neq 0, \sqrt{D(y)} \neq 0$$

$$NPCR = \frac{1}{M \times N} \sum_{i=1}^{M} \sum_{j=1}^{N} D(i,j) \times 100\ \%$$

$$UACI = \left[ \sum_{i=1}^{M} \sum_{j=1}^{N} \frac{|C1(i,j) - C2(i,j)|}{255} \right] \times \frac{100\%}{M \times N}$$

$$D(y) = \frac{1}{K} \sum_{i=1}^{K} (y_i - E(y))^2$$

The correlation coefficient is another essential constraint to ensure that how much efficient is the encryption algorithm[5]. Figure 1: Illustrates the Real Images and Encrypted Image. Figure 2: Illustrates the block diagram of data hiding procedure: Encoder. Figure 3: Illustrates the block diagram of data hiding procedure: Decoder.

$$r_{x,y} = \frac{C(x,y)}{\sqrt{D(x)}.\sqrt{D(y)}}$$

Where $C(x,y), D(x)$ and $D(y)$ can be evaluated by using the following equations [6].

$$C(x,y) = \frac{\sum_{i=1}^{K} (x_i - E(x))(y_i - E(y))}{K}$$

$$D(x) = \frac{1}{K} \sum_{i=1}^{K} (x_i - E(x))^2$$

$$D(y) = \frac{1}{K} \sum_{i=1}^{K} (y_i - E(y))^2$$

## III. LITERATURE REVIEW

Nodehi et al. proposed a symmetric image encryption scheme based on 3D chaotic cat maps. Due to some inherent characteristics of images, such as bulk storage capacity and high redundancy, image encryption differs from that of documents, which are usually difficult to manage using conventional methods. Thanks to the extremely desirable properties of mixing and sensitivity to initial conditions and parameters of chaotic maps, Chaos-based encryption has proposed a new and efficient way to deal with the intractable problem of simple and highly protected image encryption. In this paper, for designing a real-time protected symmetric encryption scheme, the two-dimensional chaotic cat map is generalized to 3D.

## IV. DISCUSSION AND CONCLUSION

This paper proposes a quality access control and monitoring scheme for the unlawful distribution of digital images by means of mutual data modulation and data hiding in a compressed domain. Experimental findings show that the use of Forward Error Correction (FEC) code increases robustness (in BER terms) in noisy channel transmission, resulting in efficient tracking efficiency against time-varying collusion operations. Experimental findings also show that the tracking data (as a watermark) is embedded without affecting the standard JPEG coding scheme's usability (in terms of bit rate and compression ratio) and is resilient against a wide range of signal processing activities. The framework is straightforward and easy to implement. It is also very safe since only one can decrypt the data for quality access

control with the correct key. Future work can be based on improving the proposed system's output using anti-collusion code in a broad collusion setting.

## V. REFERENCES

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