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Image Encryption – An Intelligent Approach of Color Visual Cryptography

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ABSTRACT

Visual cryptography is a secret sharing method that uses human eyes to decrypt the secret. It has computation-free decoding process to decrypt the images. Generally visual cryptographic methods utilize the technique of secret sharing in which secret image is divided into shares and when k shares out of n stack together the secret image will reveal. In this paper we proposed a method of visual cryptography for colored images. We are using RGB color model for color images. First of all, image is divided into monochromatic channels then converts each individual image to binary image. After this we can apply basic VCS scheme. The secret image can be recovered by stacking share images. We are using Matlab7.4 for implementing our scheme.

Keywords

Visual Cryptography, Secret Sharing, RGB, Image processing.

1. INTRODUCTION

The traveling salesman problem (TSP) is to find a tour of a given number of cities (visiting each city exactly once) where the length of this tour is minimized. The TSP is defined as a task of finding of the shortest Hamiltonian cycle or path in complete graph of N nodes. It is a classic example of an NP-hard problem. So, the methods of finding an optimal solution involve searching in a solution space that grows exponentially with number of city [1].

Visual Cryptography, Secret Sharing, RGB Cryptography is the enciphering and deciphering of data and information with secret code. Visual cryptography uses the same concept except that it is applied to images. Visual cryptography is a cryptographic technique which applies on such information like pictures, text, etc to be encrypted in such a way that the decryption can be performed by the human visual system without the aid of computers.

Visual cryptography can also be somewhat deceiving to the inexperienced eye, in such a way that, if an image share were to fall into the wrong hands, it would look like an image of random noise or bad art. Visual Cryptography Scheme (VCS) proposed by the Naor and Shamir serves as a basic model and has been applied to many applications. Naor and Shamir proposed [2] the (t, n) threshold scheme or t out of n threshold scheme, a secret binary image (SI) is cryptographically encoded into n shares of random binary patterns. The shares are Xeroxed onto n transparencies, respectively, and distributed amongst participants, one for each participant. No participant knows the share given to another participant. Any t or more participants can visually reveal the secret image by superimposing any t transparencies together. The secret cannot be decoded by any t-1 or fewer participants, even if infinite

Computational power is available to them. After this basic concept many researcher find out different schemes for the visual cryptography [1]. This improvement goes to gray scale image to color images and different ways and techniques were developed with amazing ideas.

Verbeul and Van Tilborg [3] proposed the scheme that extends the basic visual cryptography scheme from binary image to color

image. In this scheme each pixel is expanded into m sub pixels. Each sub pixel may take one of the colors from the set of colors.

In 2000 C.N. Yang [8] proposed new VCS scheme for the color images. This scheme is implemented on the basis of a black and white VCS scheme and gets much better block length than the Verbeul-Van Tilborg scheme.

2. RELATED WORKS

Naor and Shamir [2] provided their constructions of visual cryptographic solutions for the general t out of n secret sharing problem. One can assume that every secret message is just a collection of black and white pixels i.e. a binary image. To illustrate the principles of VC, consider the simplest (2, 2) visual threshold scheme where each pixel p of the SI is encoded into a pair of sub pixels in each of the two shares as shown in the Fig. 1. The first two pairs of sub pixels in the selected column are assigned to share 1 and share 2, respectively. Since, in each share, p is encoded into a black- white or white-black pair of sub pixels, independent of whether p is black or white, an individual share gives no clue as to the value of p. Now consider the superposition of the two shares as shown in the last row of Fig. 1. If a pixel p is white, the superposition of the two shares always outputs one black and one white sub pixel, no matter which column of sub pixel pairs is chosen during encoding. If p is black, it yields two black sub pixels.

There is a contrast loss in the reconstruction; however, the decoded pixel is readily visible Black and white pixels using this basic VCS Scheme we cannot completely recover the white Secret pixel which causes loss in contrast. In XOR based VCS scheme where the share images are superimposed using XOR operation which results in perfect reconstruction of both. Fig. 2 shows an example of (2, 2) VCS scheme where the share images are larger than the original secret image and decrypted images using XOR operation in superimposition produces the less distorted image.

Pixel	White	Black
Share1		
Share2		
Stack Share 1 & 2		

Fig. 1. Construction of a two-out-of-two VC scheme: a secret pixel can be encoded into two sub pixels in each of the two shares.

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ABSTRACT
We discuss the problem of preserving the privacy of digital face images in a networked environment. In the proposed scheme, a given face image is divided into two face image parts such that it can be stored and transmitted over a network without revealing any information about the original image. The proposed scheme is based on the principle of visual cryptography. The proposed scheme is based on the principle of visual cryptography. The proposed scheme is based on the principle of visual cryptography. The proposed scheme is based on the principle of visual cryptography.

1. INTRODUCTION
Privacy is defined as the extent of controlling the identity of an individual based on personal information in the organization, the right and access. A networked environment is characterized by connectivity and sharing of information. The networked environment is characterized by connectivity and sharing of information. The networked environment is characterized by connectivity and sharing of information. The networked environment is characterized by connectivity and sharing of information.

Chapter 21 Security and Cryptographic Engineering in Embedded Systems

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ABSTRACT

Strong security is a necessity in the modern IT world and is broadly provided through Hardware Security Modules (HSM) capable of realizing a wide variety of security algorithms and protocols. Such modules are no longer only found in expensive computer systems like servers, corporate PC, or laptops but also in every device where security is required, including embedded systems like smart cards or smart grid, smart environment, automobile, game station, and aviation processors. The chapter provides to the reader the necessary information on how strong security is structured in a hardware embedded system environment from cryptographic engineering point of view. The focus is efficient design on symmetric, asymmetric cryptography and hash function systems, and design approaches that can be used in order to provide strong security to the embedded system user.

INTRODUCTION

The immense growth of portable and mobile systems (smart phones, tablets, netbooks) and the increasing integration of computational logic into any devices through initiatives like future Internet and Internet of things have led to a flourish in embedded system technology stemming the creativity of the IT market to new levels. Wireless, mobile and portable devices are gradually replacing many traditional computer systems due to the increasing user need for mobility in high-end technology

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