CHAPTER I. INTRODUCTION

1.1.   Overview

Along with the advancement of technology, exchange of information through digital media are increasingly being carried. Advantages to viewing online video content include: A wide variety of content creators; access to content on-demand and multiple times, which creates a more interactive and personalized experience; more targeted, fewer, or no advertisements; access to non-professionally produced content; and the ease of sharing content through online channels [1].

People are increasingly viewing, providing, and recommending video content through the Internet. Applying the uses and gratifications framework, along with contextual age and generational theory, this study identifies and compares motivations for, and their influence on, traditional TV viewing and online user-shared video use among a U.S. sample of adult Internet users [1].

This video sharing media can be used to covert secret message among individuals called Steganography. These secret messages are put inside honest carriers. Carriers can be digital images, audio files, video files and so on. The limitation in sending concealed longer messages has been overcoming by the inclusion of video files as carriers [2].

Least significant bit (LSB) insertion is a common and simple approach to embed information in an image file. In this method the LSB of a byte is replaced with an M‴s bit. This technique works good for image steganography. To the human eye the stego image will look identical to the carrier image. For hiding information inside the images, the LSB (Least Significant Byte) method is usually used [3]. Enhanced LSB algorithm works in the spatial domain. It improves performance of LSB by hiding information in only one of the three colors that is blue color of the carrier image [3].

To accommodate a secret message, the original image, also called the *cover image*, is slightly modified by the embedding algorithm to obtain the *stego image*. The embedding process may depend on a secret *stego key KS*. The stego key is used to control the embedding process, such as the selection of pixels or coefficients carrying the message, etc [4].

This research proposed a stego key utilize a human detection method on cover video to initiate the place where are secret message will be embedded. The first need is a robust feature set that allows the human form to be discriminated cleanly, even in cluttered backgrounds under diffcult illumination. We study the issue of feature sets for human detection, showing that locally normalized Histogram of Oriented Gradient (HOG) descriptors provide excellent performance relative to other existing feature sets including wavelets [5] [6].

In the image insertion process, done by specifying the frame contained in the detection of people, which is the reference point at the beginning of a secret message insertion into video frames. The performance of the system was tested by calculation of the Mean Square Error (MSE), Peak Signal to Noise Ratio (PSNR), Bit Error Rate (BER) and Steganography Capacity.

1.2. Problems

Based on research purposes, can be formulated matters discussed in this research, including the following:

1. Insert a secret message in the video frame with Least Significant Bit method.
2. Detection of human image in video frames
3. The effect of the messages length and video frame size to cover the time needed for the process of insertion and extraction of the secret message.
4. The effect of message insertion to video frames in term of BER, MSE and PSNR.

1.3. Problems Limitations

The scope of the use of this research include :

1. The system is designed in the form of the simulation process of insertion and extraction of confidential messages without going through the transmission medium.
2. Cover video used to have *.avi format which containt full image of peoples in stand up pose.
3. Inserted secret message must be in a RGB image format * .bmp.
4. Insertion of messages carried out after a detection of people on particular frame.
5. Method used is the Least Significant Bit as a method of insertion and extraction of confidential messages.
6. Method used in people detection is Histogram of Oriented Gradients(HOG) with Support Vector Machine as classifier.
7. The performance parameters analyzed include: MSE, PSNR, BER, and Steganagraphy Capacity.

1.4. Objective

This research carried out to accomplish of these objectives :

1. Inserting a secret message in the video frame using the Least Significant Bit.
2. Detection of people on frame with HOG method with any confidence value.
3. Analyzing the capacity of video cover to accommodate the insertion and extraction of messages based on the influence of the length of the message.
4. Analyzing the performance of steganography using parameters such as: Mean Square Error (MSE), Peak Signal to Noise Ratio (PSNR), Bit Error Rate (BER), and capacity ratio of the cover video.

1.5. Hypothesis

Find new method of stego key generator with the capability of people detection using HOG method in the simplest steganography, Enhanced Least Significant Bit message embedding.