Human Visual System Model for Data Spatial temporal adaption of Data Hiding methods

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Abstract: In network applications communication is the main aspect in present days. Data transformation is the process of sending data from one person to another person. In this contrast present security is the main issue in network communication. Steganography is the one of the data hiding technique that can be used in secret data sharing applications. Traditionally Forbidden Zone Data Hiding was developed in data security mechanism. By using framework present in the forbidden zone data hiding we developed different data hiding processes for video Steganography. Secured erasure cryptography techniques were developed in data sharing between every movement for text extraction. But in this technique customer interaction is less for network communication and data hiding process with security. So, in this paper we propose to extend Forbidden Zone Data Hiding technique with Human Visual System. Human Visual System is used by video processing expert to deal with biological and psychological processes that are not fully understood. Our experimental results show efficient data security based on Human Visual System based on spatial temporally adaption of data hiding methods.

Keywords: Data hiding, selective embedding, forbidden zone data hiding, error concealment, synchronization.

I. INTRODUCTION

Data hiding has been used in various applications like copyright protection, fingerprinting, broadcast monitoring, and authentication, so on. Privacy is protected by narrowing images of individuals from the video and the original data is preserved by hiding it in the compressed bit stream of the modified video. The widespread of the Internet and World Wide Web has changed the way digital data is handled.

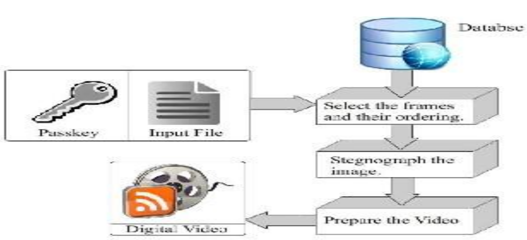

Figure 1: Data Hiding Techniques Using Steganography.

Data Hiding is the process of embedding information into a host medium. Data hiding deals with the ability of embedding data into a digital cover with a minimum amount of perceivable degradation. Data hiding consists of two sets of data:

- The cover medium
- The embedding data

Visual and arual media are preferred due to their wide presence and the tolerance of human perceptual systems involved. Data hiding in video sequences is performed in two major ways:

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- Bit stream-level:

The redundancies within the current compression standards are exploited. Encoders have various options during encoding and this freedom of selection is suitable for manipulation with the aim of data hiding. This type of data hiding methods is generally proposed for fragile applications like authentication.

Data-level: Data level methods are more robust to attacks. They are suitable for a broader range of applications.

Most of the video data hiding methods utilize uncompressed video data. A high volume transform domain data hiding in MPEG-2 videos is proposed in [2]. They applied quantization index modulation (QIM) to low frequency DCT coefficients and adapted the quantization parameter based on MPEG parameters. They varied the embedding rate depending on the type of the frame. Insertions and erasures occur at the decoder that causes de-synchronization. They utilized repeat accumulate (RA) codes in order to withstand erasures. RA codes are already applied in image data hiding. Adaptive block selection results in de-synchronization and they utilized RA codes to handle erasures.

By using this requirement specification of the existing approach we are proving an efficient data hiding technique to improve the current state-of the Art coding algorithm by better exploiting properties of the receiver based instruction.

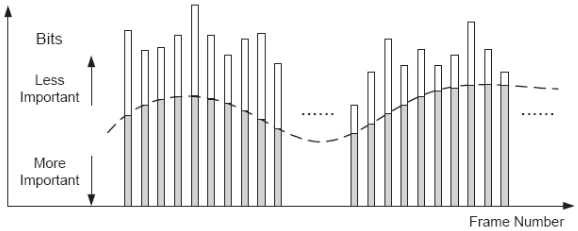

Figure 2: Bit stream scaling in rate scalable video communications.

Our work standards the intersection of the promising research trends for data transferring. As shown in the above figure the proposed model is converted video into image pixels notations. Our research has been focused on combining the foveation model with embedded bit plane coding techniques, which are rate scalable and have achieved great success for uniform resolution image/video coding.

II. RELATED WORK

DATA HIDING SCHEME:

The main blocks of the H.264 video encoder are depicted in Fig. 3.

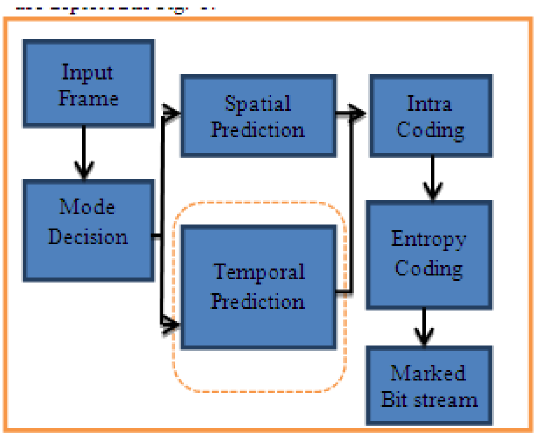

Figure 3: H.264 Video Encoder.

The Temporal Prediction block is responsible for the *inter prediction* of each inter frame. The most important part of inter prediction is the motion estimation process that aims at finding the "closest" macro block (best match) in the previously coded frame for every macro block of the current input frame. The current frame with in the each block is compensated and the residual macro block is added. The H.264 standard has adopted seven different block types and the motion estimation is applied on each of these types as discussed in [4]

.FORBIDDEN ZONE DATA HIDING:

Forbidden zone data hiding (FZDH) is introduced in [5]. The method depends on the forbidden zone (FZ) concept that is defined as the host signal range where no alteration is allowed during data hiding process. Forbidden zone (FZ) methods are defined as that no change is permissible at the time of data hiding process for a host signal range. It has been used by FZDH to regulate the strongness-invisibility tradeoff.

Consider *a* (bold denoting a vector) be the host signal in R^N and *n*C {0, 1} be the data to be hidden. The marked signal ***x*** is obtained as given in

$$X=\begin{cases} a, & a \in FZ_n \\ M_m(a), & a \in AZ_n \end{cases}$$

Where FZ_m *means* forbidden Zone and allowed zone (AZ_m) pair defines the host signal zones where alteration is allowed or not and M_m (.) is a mapping from R^N to a suitable partition of R^N. The key point of FZDH is the determination of the zones and the partitions. A practical design can be performed by using quantizers. A simple parametric form is derived that the mapping function is defined as

$$M_m\,(a)= \{a+e_m(1-\frac{r}{||e_m||})$$

q_m (.) is a quantizer indexed by m and e is defined as the difference vector between the host signal and its quantized version:

$$e_m \triangleq Q_m(a)-a$$

The mapping function states that the host signal is modified by adding an additional term that is a scaled version of the quantization difference. The reconstruction points of the quantizers that are indexed by different m should be non-overlapping in order to full fill the requirement of mutual exclusion, which can be achieved by using a base quantizer and shifting its reconstruction points depending on m. As shown in the fig.3 a typical embedding function that uses a uniform quantizer.

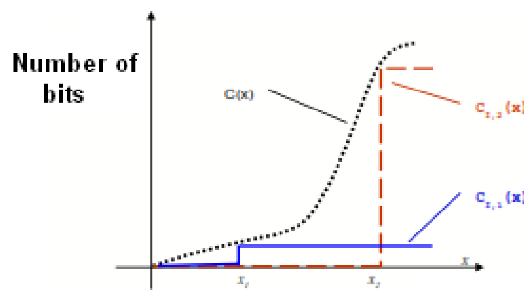

Figure 4: A sample embedding function of FZDH in 1D. Ci is a reconstruction point of the quantizer.

The generic minimum distance decoder is utilized to decode the hidden data

$$\hat{m} = arg_m^{\min d\,(y, y_m)}$$

y = The received signal

y_m= Equal to its FZDH embedding operation

III. EXISTING SYSTEM

Traditionally, we propose a block based adaptive video data hiding method that incorporates FZDH that is shown to be superior to QIM and competitive with DC-QIM[6] and erasure handling through RA Codes. We employ block selection (Entropy Selection Scheme) and coefficient selection (Selectively Embedding in Coefficients Scheme)

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together. De-synchronization due to block selection is handled via RA Codes. The coefficient selection is handled by using multi-dimensional form of FZDH in varying dimensions leads to de-synchronization. It contains following parts to this application, they are Framework, Selective Embedding, Block Partitioning and Erasure Handling. Using these concepts present in the existing approach they are providing accurate results for accessing commercial data transfer with security is the main assurance.

IV. PROPOSED APPROACH

In this paper we propose to extend our existing approach for providing synchronization process in each pixel process, i.e. Our visual system is well adapt enable comparison video with dissimilar image sizes, viewing environments, frame rates, video quality classes.

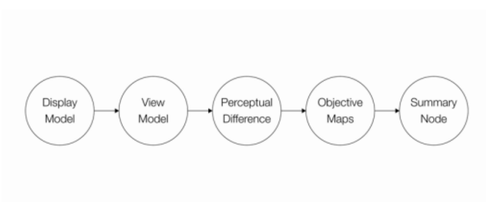

Figure 5: Simulation system Diagram.

Human vision contrast threshold response has been tested as a function of spatial frequency luminance with temporal frequency regions. Our proposed human visual system processes temporal frequency results of the proposed process. In this way we are performing secrete data sharing applications regarding contrast based security mechanism developed for providing more and efficient security.

V. EXPERIMENTAL ANALYSIS

We perform experiments in three stages. First and foremost we compareQIM and FZDH by means of their raw decoding error performanceswithout any error correction. Next, we observe the performance of the proposed framework against various common video processing attacks. Finally, we compare theproposed video data hiding framework against JAWS and the method by using MPEG-2 compression attack.

Video Quality Radio Protection System: The display model simulates the digital video signal to light conversion processes.

The Human Visual Model: It takes into account behavior including adaption with response data sets.

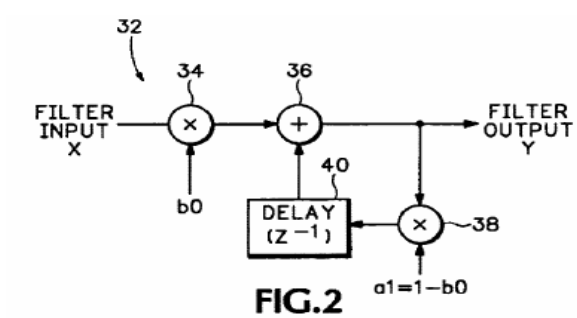

Figure 6: Adaptive Integrator process.

As shown in the above figure the process of filtering and integrated data directions automatically. Using some integrated aspects present in the video data sharing applications.

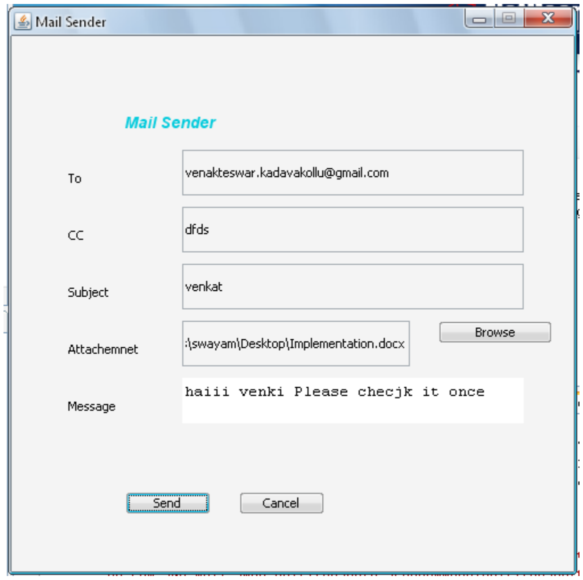

Figure 7: Client server process with sending file from one to another.

Consider the discussion present in the adaptive data filtering process we present data transferring between User send mails to another person who want their literal details of the sending information present in the sender information process.

VI. CONCLUSION

By using framework present in the forbidden zone data hiding, we develop different data hiding processes for video data hiding. Secured erasure cryptography techniques were developed in data sharing between every movement for text extraction. But in this technique customer interaction is less in network communication. In this paper we propose to extend Forbidden Zone Data Hiding technique with Human Visual System. Human Visual System is used by video processing expert to deal with biological and psychological processes that are not fully understood. Our experimental results show efficient data security based on Human Visual System. Our proposed human visual system processes temporal frequency results of the data hiding methods. In this way we are performing secrete data sharing applications regarding contrast based security mechanism developed for providing more and efficient security.

Future enhancement of our proposed secret data Sharing using human visual systems, can be applicable to different secure hash algorithms for unique identity secret sharing.

VII.REFERENCES

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