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Reversible and Tunable Data Hiding with Advanced Video Coding

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Abstract— ***Due to broad usage of digital broadcasting application, information can be hackneyed and duplicated. Hence, multimedia security & copy right protection is becoming crucial. Steganography is an outstanding apparatus in providing protection as well as security to multimedia information by hiding digital content. H.264/Advanced Video Coding (AVC), a recent international standardized video coding technique which is under expansion, has presented a major revolution in video compression efficiency. The encoding efficiency of AVC is sophisticated than previous ethics such as H.263. In this paper, a complexity video embedding on H.264 is employed. So as to hide the secret image, chaos image encryption technique has been used where shuffling positions and altering grey values of image pixels are done. The secret image is embedded into video sequences by varying coefficients of I and P Frames. In decoding process, embedded information can be extracted without loss of compressed video content. Applications of proposed method include medicine, military where loss of carrier data is not permitted. Proposed model affords an overview of technical features and relative characteristics of H.264 standard that gives good PSNR and embedding capacity.***

Index Terms— ***Advanced Video Coding, Chaos Encryption, Decoding, Tunable Data Hiding and Embedding Capacity.***

I. INTRODUCTION

This Video coding (compression and decompression) is active to manipulate video signals to moderate bandwidth and memory required devoid of compromising on quality of input video. It has a broad range of applications in area of video streaming services like internet video downloading and uploading, live streaming channels, video conferencing applications and terrestrial transmission systems, mobile networks, video, camcorders, security applications. Almost all video standards currently are dispersed and dumped in a compacted format such as video conference, video surveillance, Internet Protocol Television and video-on-demand that request a higher compaction rate to encounter bandwidth standards and quality of video as promising.

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Conversely, for real time presentation there is more demand for a low complexity technique to implant secret image in a video. On other side, innovative challenge for transmission of video is needed to justify that original content has not been duplicated purposefully and that it is transmitted only to certified users. The foremost necessities of video coding with steganography include robustness imperceptibility, and capacity.

In the initial stage, secret data hiding is done before compression process; here insertion will be done in spatial domain by adding mask straight to video frame. Else, secret data hiding is accomplished in frequency domain where signature has to be embedded into frequency coefficients of an input video. Some of renovations are conceivable such as discrete cosine transforms [1], discrete Fourier transforms [15] and discrete wavelet transforms [14].

The H.264/AVC standard turns to be most extensively organized video codec method for majority of application due to which several watermarking techniques are designed. Ke Niu [1] proposed a histogram shifting based reversible data hiding technique. But the watermarking scheme is only applied to plain text. Wang R et.al [3] developed a 2D RDH error concealment algorithm using H.264.However more embedding distortion is a major problem of this method. In [7], extensive selective encryption with video streams was presented. The advantage is it preserves the better video bit rate, but this approach has a drawback of not providing a detailed exploration of CABAC regular mode cipherable syntax elements in this paper. H.264/MPEG-4/AVC standardized in 2003. This video coding standard showed significant improvement in several crucial applications from 2003–2009. H.264/AVC is an empowering video encoding & decoding advanced technique for digital video broadcasting in all possible domains that H.262/MPEG-2 and H.263/MPEG-3 could not conquer [10].However main drawback is computational time.

In proposed system, an effectual method to embed secret image is suggested for video broadcasting using H.264/AVC. Designed model supports double encoding and comprises reliable embedding capability to H.264/AVC standard devoid of harmfully disturbing overall Peak Signal-To-Noise Ratio (PSNR) to video bit-stream. Following sections are systematized as follows: section 2 defines literature survey and section 3 is about the methodology of proposed scheme. In section 4 experimental results and section 5 performance analysis are discussed. Lastly, section 6 draws conclusions of this paper.

II. LITERATURE SURVEY

The literature survey of my proposed work which is based on research carried out by many researches related to various approaches for video watermarking with H.264 is discussed as follows.

Ke Niu et.al [1] has proposed a RDH model using H.264. Histogram Shifting (HS) of the motion vector components are utilized effectively in data hiding to keep secret information.

By describing an explicit decoded reference frame, and distortion accumulation effects are due to change of motion vectors has been overcome. All decoded data may be re occupied without losing of original data. The experimental outcomes show that this model is simple, has higher limit and imperceptibility and can regulate relationship between limitation and invisibility depends on embedded load.

Guan Z H et.al [2] has suggested a novel image encryption scheme. Here inter changing positions and altering image pixels grey values are concatenated to complicate the association between original data and encrypted image. Originally, Arnold-cat-map is utilized to scramble pixel positions in spatial-domain. Soon after Chen's chaotic discrete output signal of system is managed to be suitable for encryption of image, and scrambled image is encrypted by signal pre-processed pixel to pixel. The tentative output gives key space is much enough to resist brute force attack and circulation of grey values of scrambled image has an unsystematic behavior.

Xu D et.al [3] has presented a fresh 2D RDH, which scheme for intra-frame error suppression. The aim is to enhancing video quality while video bit-stream incurs transmission faults. This model comprises of embedding motion-vector (MV) of macro-block (MB) into MB inside same intra-frame, and removing embedded MV from obtained video frame for restoration of corrupted MB. Based on histogram shifting characteristic and flow of motion vector data an explicit 2D RDH appliance is suggested.

Yao Y et.al [4] has suggested an operative model for encrypted H.264/ AVC video bit streams data hiding. In encryption stage, partial residual coefficients, intra-prediction mode code words and motion vector differences are scrambled without increment of video bit rate for protecting video content privacy. In data embedding stage, they firstly present a theoretical analysis of frame distortion initiated by subsequent inter-frame distortion drift and data embedding. Based on analysis, they evaluate hiding misrepresentations affected by altering various residual parameters and hide in formation in residual coefficients with diverse primacies for reduced inter-frame distortion drift.

Xu D et.al [5] proposed an upgraded model for data embedding for moderately encrypted H.264/AVC videos. It is done through employing CABAC bin-string replacements. The Luma prediction modes encryption is deliberated including motion vector and residual encryption to considerably expand structural corrosion. Both abs level and abs MVD bin-strings are demoralized the data embedding to provide higher elasticity for the users to choose trade-off among video quality and hiding capacity. Since data inserting has done in encrypted domain, proposed model conserves privacy of video content. By the help of an encrypted video having secret data, receiver can achieve directly data extraction in encrypted domain by using only data-hiding key.

Safwan El Assad et.al [6] has presented an oval robust chaos encryption scheme and they evaluate its efficiency. Cryptosystem utilizes diffusion subsequently bit-permutation layer, to shamble image pixel positions. Furthermore, permutation layers are accomplished by a new suggested formulation of 2-D map, which permits an effective implementation, calculated by time complexity, in terms of logical and arithmetic operations. Hence, it gives an effectual diffusion process for banquet influence of single bit over others. The novel cryptosystem comprises a uniform chaotic pseudo-random generator to alter control parameters in every round of encryption/decryption processes.

Benoit Boyadjis et.al [7] has given a Selective-Encryption (SE) technique for HEVC streams and H.264/AVC (CABAC) both. Explicitly, this task describes key security issue which SE is facing: data protection, associated to information leakage amount via a secured video. Our involvement is visual distortion enhancement prompted by these SE methods. They propose encryption of most extensively employed form of CABAC: default mode. It permits to encode major data for video reconstruction. Troubling their measurements may cause bit-rate overhead, which is trade-off enhancing content security level.

Shiphing Zhu et.al [8] has presented a fractal theory and H.264 based inters prediction video coding technique. This yields similar tactic to do intra-predictions as H.264 and learning implementation of fractal theory can do inter-predictions. Several enhancements can depict here. Firstly, chrominance, luminance components coded individually and barriers are not available for longer accompanying as in H.264. Second, for chrominance components partition mode is altered and block size now divided from 16*16 to 4*4, i.e similar to luminance components. Lastly, it gives us adaptive quantization parameter off-set, altering offset for each frame in quantization process can get enhanced form of reconstructed frame.

Adamu Muhammad Buhariaet.al [9] has presented a water marking technique based on human visual system by H.264/SVC standard for spatial scalable coding. Proposed technique mines features from higher energy quantized coefficient with 4x4 luma intra-predicted blocks of all slices, and inserts logo into exceedingly texture blocks that at least has a single coefficient in 6 chosen locations. Here similar inserting procedure is conducted for each layer of video to enhance strength against common attacks. Tentative results were proved by inserting up to 8192 watermark bits into a 4-layer spatial scalable coded video.

Wallace Kai-Hong Hoet.al [10] suggested a concurrent content-based accessible video coding. Presented algorithm is conducted on real-time video surveillance usages for road traffic monitoring. For given system, moving objects, i.e. cars, are initially segmented from steady background. Their activities are then differentiated as slow or fast by evaluating uniformity of their motion.

The info is then passed to a modifiedH.263 coder to decrease spatial and temporal redundancies in a video. Compared to conservative H.263 encoder utilizing same purpose, constructed model has 20% increment in the compression rate with the negligible visual distortion.

III. METHODOLOGY

Proposed block diagram of proposed work is described in this section. Efficiency of coding is nothing but its capability to encode video at lower possible bit rate despite of preserving quality of video. Hence, at present there are 2 typical means to analyze coding efficiency of video coding standard, that are to use an objective metric, use subjective valuation quality of video. Subjective assessments are recognized to be most effectual mode to calculate video coding standard.

In order to assurance visual softness, secret data has to be insert into more redundant textured blocks since, eyes of human are less delicate to noise in detail regions and edge instead of smooth areas. If there are more non-zero quantized coefficients, the residual block becomes more textured region. Hence, Number of non-zero quantized coefficients can be taken to evaluate residual textures. Precisely, non-zero quantized coefficient denotes higher prospects of spatial details of equivalent block. To sinking decrement of video quality, chaos encrypted secret image has to be encoded into residuals that has a higher number of nonzero coefficients.

Here, P-frames are taken as host frames. Secret image bits are encoded into P frames of video sequence, by altering non-zero coefficients in a 4×4 block. Firstly, it executed additions, and then shifts in 16-bit arithmetic. Another, for intensity of floating-point arithmetic, there will no difficult of disparity both on an encoder and decoder side for an arithmetic of integers. Our role is to suggest a strong watermarking model with low complexity of encoding and decoding routines. The model best suits for a present encoder system, (IPTV), video conference, video surveillance system. Details of chaos method, encoding and decoding procedure are described as follows.

A. Chaos Encryption

The logistic map equation is the one dimensional chaotic system with Y output and input with the two initial conditions with x and u as follows in the equation (1),

$$y_{n+1} = ux_n(1 - x_n) \qquad (1)$$

u < [1, 4] and x < [0, 1] in which the chaotic behavior is achieved when u = 3.9999 and x = 0.4000. Here our model used logistic map equation to alter pixel mapping tables (PMT) and to shift pixel values [2].
Encryption model is separated into 2 sub procedure for pixel substitution method and pixel scrambling method. In pixel replacement it changes pixel values and in pixel scrambling it changes pixel position. In our model, pixel replacement approach is used with 2 pixel mapping table created by using logistic map. A PMT table is defined that contains pixel value ranges from 0 to 255 in the shuffled order. Our technique used two PMTs, one is replacement of pixel values using PMT1 so the current pixel is not same after the replacement and second is to increase uncertainty of cipher image row replacement and column replacement is used.

B. H.264 Encoding

The advanced video encoding scheme of the proposed method has been illustrated here. As declared earlier, a technique of an effective and strong watermark has to take into considerations 2 crucial criteria: data invisibility, and enclosure capacity to forcibly quantity of data is to be embedded within a video. The detailed workflow H.264 encoding is depicted in Fig 1.

In depicted model, chaos encrypted images are embedded in P-frames by altering non-zero quantized coefficients of 4*4 blocks. An input frame is separated into 16*16 Intra-Macro Blocks (IMBs), each having16, 4*4 blocks [9]. Every block has converted by DCT and which can be quantified by utilizing explicit quantization matrix of H264/AVC standard. This model consists of bits into 4x4 blocks; encoded data are implanted into quantized luminance DCT coefficient. [1].

Chaos image encryption in 4x4 blocks encounter require of Human Visual System (HVS), in which human eyes are less delicate to noises in detail regions or edges other than the plane areas.

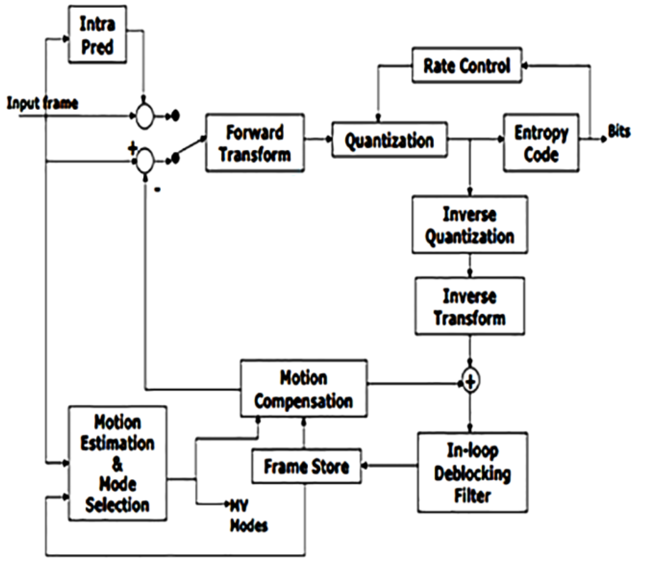


Fig 1: H.264 Encoding

The embedding is performed straight on compressed stream by picking non-zero DCT frequency coefficients in 4*4 blocks. Subsequently, quantification is easy, which is required to embed secret image, after quantization which avoid obliterating watermark. Embedding of image in transformation of coefficients before quantization can be partially or completely smashed them after quantization assaults. An old water marking techniques are consistent alongside H.264/AVC compression. Our presented model proceeds with advantages of H.264/AVC codec to insert hidden data. In addition, entropy encoding and decoding are 2 best actions letting data insertion and identification. Additional, data embedding in these coefficients advances expressively robustness of water marking technique and enhances energy of data, invisible corrosion of processed signal.

A block picking improves security of suggested technique. The data is transferred over numerous frequencies so that altered coefficients are lesser.
For encoding process, 4×4 block in which value of quantity of non-zero coefficients is not lesser than threshold K are selected. After quantization, these coefficients in this block are calculated.
The contribution is to accomplish low complexity in encoding and decoding practices. This model is appropriate for Real-Time (RT) system of encoding for instance, video streaming of dynamically finger-printed authentication. At that time, model evades a Bit-Rate Increase (BIR), and advances embedding capacity and runtime-efficiency without losing quality factor. So as to assure visual imperceptibility, secret information has to be inserted into more textured blocks. As a result, non-zero quantized coefficients maybe recognized for estimation of texture of residuals.

It's obligatory to pick coefficient values which don't affect bit-rate and video quality for the quantized coefficients 0 and 1, so that acts as a major role in entropy coding stage. An alteration of zero coefficients enhances significantly to bit-rate and alteration of bits 1 & 0 effects considerably video quality. For that, only non-zero coefficient in block is altered to insert secret image. So, it can be utilized to avoid watermark insertion into all blocks with all 0 coefficients, and accordingly change of bit-rate by watermark embedding may be assured to be minor. The zero- valued quantized coefficients are also not utilized for insertion. Moreover, nonzero coefficient can't be altered to zero and vice-versa, that's why altering none zero coefficients degrades considerably the visual quality which enhances video bit-rate.

C. H.264 Decoding

During the decoding procedure, the proposed model uses exactly the reverse process of encoding. The decoding practices are performed among entropy decoding and inverse quantization. An explanation of decoding procedures is explained as shown in Fig 2.

Firstly, decoder has to be conversant about secret data that can find 4x4 embedding block k conferring to secret image. Next, decoder picks non-zero co-efficient of P 4*4 blocks. If it is odd no., watermark bit should be {1}, else {0}. If a H.264/AVC stream-receiver suspect, that video stream is interfered with or intentionally modified for any reason, after that watermark verification and extraction technique can be applied to approve integrity and credibility. [8].

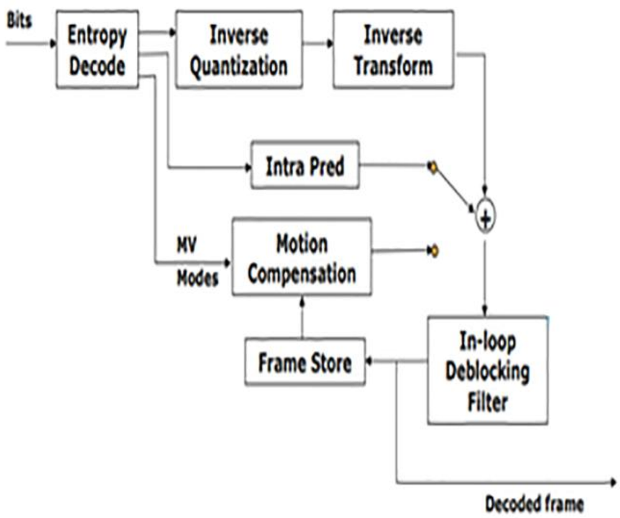


Fig 2: H.264 Decoding

If AVC stream-receiver doubts that video stream is damaged with intentionally modified for any reason, watermark verification and extraction technique can be applied to confirm integrity and authenticity. Obviously, extraction processes are fast and simple, since hidden authentication data can be identified exclusively from non-zero residuals and effectively accessible intra/inters prediction modes.
Algorithm for data embedding and extraction for proposed method is defined below.

D. Data/Image Embedding Process

Step 1:- Select and read the input video
Step 2:- Convert the video into frames
Step 3:- Initialize the H.264 parameters
Step 4:- Select and read the input secret data/image
Step5:-Encrypt the secret data/image using chaos encryption Method
Step 6:- Apply the H.264 encoder process.
Step 7:- Encrypted data hiding in H.264 encoder frame macro blocks
Step 8:- H.264 data stream→Data embedding process is completed
Step 9:- Robustness calculation for embedded video like MSE, PSNR, Entropy, SSIM, Embedding capacity

E. Data/Image Extraction Process

Step 1:- Apply the H.264 decoder process
Step 2:- Extracting the data from H.264 decoder frames
Step 3:- Data extraction process is completed
Step 4:- Apply the chaos decryption process
Step 5:- Reconstructed the output video

IV. EXPERIMENTAL RESULTS

Experiments were performed using MATLAB H.264 codec. Initially video is selected and converted into frames. One frame is taken as input and secret image is embedded into it. Next encoding process is carried out by initializing H.264 parameters. Chaos encryption scheme is employed for encrypting the secret image.

In the proposed method, four different input video sequences are taken: foreman video, railway track video, human body animation video, engineering video as shown in Fig.3, 4, 5, 6 respectively. Properties of all input video sequences are listed out in Table-I. Properties of secret image, chaos encrypted image and chaos decrypted image are defined in Table-II. The first frame is I-frame, rest all are P-frames and QP=27.

Foreman video and secret image are taken as input as shown in Fig 3a) and 3b) respectively. After that encoding operation is performed on both inputs which is a video and an image. Let k (m, n) be the gray-level of the pixels at row m, column n, then P(E) can be obtained by equation (2)

$$P(E) = \Sigma_{((m,n)\varepsilon block(E)} k(m,n) \qquad (2)$$

Let S be transformation result of each pixel given by equation (3)

$$S = round\,(A*\sin(2\pi d/\lambda)) \qquad (3),$$

where, $A = 128*(XOR\,(P\,(E) + 1)$, $\lambda = (XOR\,(P\,(E))/2) + 1$

For encryption, Pixel (out) =mod [(Pixel (original) +s), 255]

For decryption, Pixel (out) =mod [(Pixel (original) - s), 255]

The required results obtained after performing above operations are shown in Fig. 3c) encoding image and 3d) chaos scrambled image respectively. After that, decoding operation is performed on encoded image and chaos scrambled image to obtain chaos de-scrambled image and compressed video, as shown in Fig. 3e) and 3f) respectively. Same operations are carried out for various videos and images and results are shown in Fig.4, Fig.5 and Fig.6.

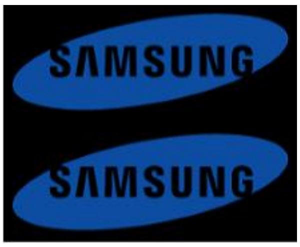
Table-I: Properties of input video sequences

Video sequence	Format	Length	Size	Frame Width	Frame Height	Frame rate (per sec)	Data rate	Total bitrate
Foreman	AVI	12 secs	3.6 Mb	352	288	25	4000	4000
Railway Track	MPG	8 secs	1.44 Mb	352	288	25	1150	1374
Human body Animation	AVI	1.02 min	6.15 Mb	640	360	23	200	328
Engineering	AVI	4 min 17 secs	54.5 Mb	640	360	23	200	328

Table-II: Properties of secret image, chaos encrypted image and chaos decrypted image

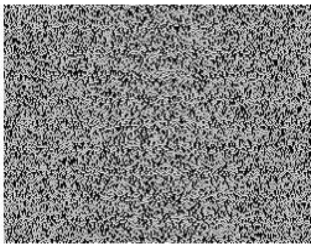
Secret Image	Input Image			Chaos encrypted image			Chaos decrypted image		
	Format	Size	Dimension	Format	Size	Dimension	Format	Size	Dimension
Samsung	PNG	7.10 KB	256*198	PNG	65.1 KB	258*199	PNG	1.08 KB	258*200
Apple	JPG	2.77KB	263*192	PNG	64.9KB	255*201	PNG	1.06KB	256*199
Lena	TIFF	786 KB	512*512	PNG	65.1KB	256*201	PNG	10.6KB	258*198
Penguin	PNG	759 KB	1024*768	PNG	65.2 KB	251*190	PNG	11.9KB	249*199

a) Foreman video



b) Secret image

c) Encoding secret image



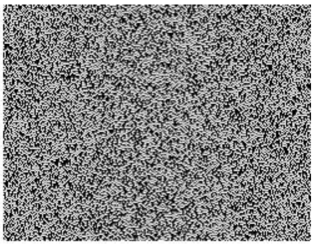
d) Chaos scrambled image

e) Chaos de-scrambled image

f) Compressed video

Fig.3. Original and reconstructed video frames for video1.(a) Foreman video, (b)Samsung secret image, (c) Encoding secret image , (d) Chaos scrambled Image, (e) Chaos de-scrambled Image , (f) Compressed video

a) Railway track video **b) Secret image**

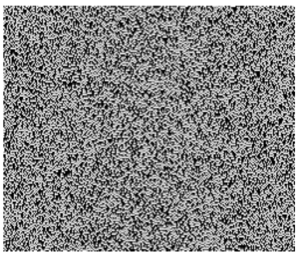


c) Encoding secret image **d) Chaos scrambled image**

e) Chaos de-scrambled image **f) Compressed video**

Fig.4. Original and reconstructed video frames for video2.(a) Railway track video, (b)Apple Secret image, (c) Encoding secret image , (d) Chaos scrambled image, (e) Chaos de-scrambled image , (f) Compressed video

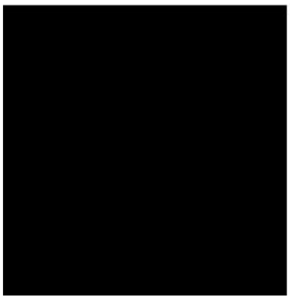
a) Human body animation video **b)Secret image**



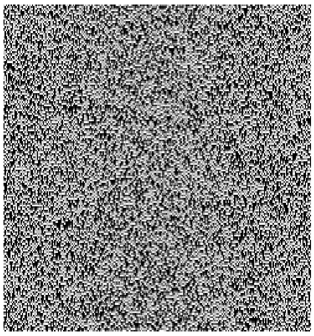
c) Encoding secret image **d) Chaos scrambled image**

e) Chaos de-scrambled image **f) Compressed video**

Fig.5. Original and reconstructed video frames for video3.(a) Human body animation video, (b) Lena secret image, (c) Encoding secret image , (d) Chaos scrambled image, (e) Chaos de-scrambled image , (f) Compressed video



a) Engineering video **b) Secret image**



c) Encoding secret image **d) Chaos scrambled image**

e) Chaos de-scrambled Image **f) Compressed video**

Fig.6. Original and reconstructed video frames for video4.(a)Engineering video, (b) Penguin secret image, (c) Encoding secret image , (d) Chaos scrambled image, (e) Chaos de-scrambled image , (f) Compressed video

V. PERFORMANCE ANALYSIS

Performance analysis for all four videos for different quality matrices are discussed as follows:

A.**Mean Square Error (MSE)**

MSE is a measure of quality of an estimator—it is always positive, and values closer to zero are better. i.e. defined in the equation (4).

$$MSE = \frac{1}{mn}\sum_{i=0}^{m-2}\sum_{j=0}^{m-2}[I(i,j)-k(i,j)]^{z} \qquad (4)$$

Fig 7 shows the simulated MSE values for H.264 codec and H.263 Codec .Obtained results show that H.264 codec gives better result in comparison to H.263.

Fig.7: MSE Graph of H.263 and H.264

A. Peak Signal-to-Noise Ratio

It is a ratio of maximum conceivable power of signal to power of disturbing noise that alters fidelity of illustration. Since some signals have very extensive dynamic range, PSNR usually depicts in terms of logarithmic dB scale. PSNR (in dB) is represented as in the equation. (5).

$$PSNR = 20.\log_{10}(MAX1) - 10.\log_{10}(MSE) \qquad (5)$$

Here $(MAX1)$ is maximum pixel value of an image.

Fig.8 shows PSNR values are 98.5692 dB and 98.1783 dB respectively using simulated using H.264 codec.

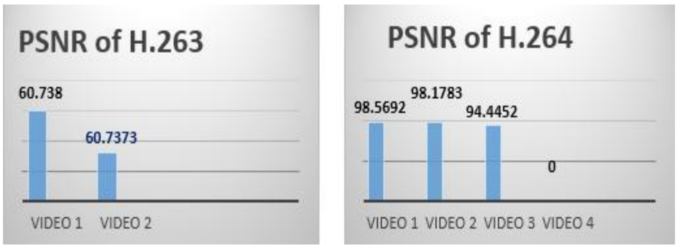


Fig.8: PSNR Graph of H.263 and H.264

B. Entropy

Entropy of a sequence can be identified from histogram of an image. Histogram depicts numerous grey level probabilities in image. Entropy is defined in the equation (6)

$$Entropy = Sum(p * \log_2 p) \qquad (6)$$

Here p is the histogram counts.

Fig.9: Entropy Graph of H.263 and H.264

C. Embedding Capacity (EC)

An embedding capacity is cardinality of group of points in concurrence matrix inside constraint area. Let A be total no. of pairs, and let E be total pairs with inserted information. Besides, payload, LSB of initial pixel of other A − E pairs is to be stored, that is only 2E − A bits are final space for watermark to be inserted. The final EC for image is depicted as given in the equation. (7)

$$C = \frac{2E - A}{2A} b_{pp} \qquad (7)$$

Fig.10 shows the embedding capacity values for H.264 codec and H.263 Codec .Obtained results show that H.264 codec has high embedding capacity in comparison to H.263

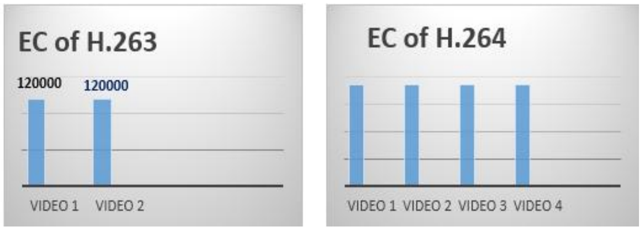


Fig.10: Embedding capacity graph of H.263 and H.264

E. Structural Similarity Index (SSIM)

SSIM is utilized for measuring similarities between 2 images. This is a full reference metric; SSIM is deliberated to advances on conventional methods such as peak signal-to-noise ratio (PSNR) and mean squared error (MSE).The SSIM index is calculated on numerous windows of images. The measure among 2 windows x and y of common size N×N is, illustrated in Eq. (6).

$$SSIM(x,y) = \frac{(2\mu_{zx}\mu_y + C_z)(2\sigma_{xy} + C_z)}{(\mu_z^{\,z} + \mu_y^z + C_z)(\sigma_x^z + \sigma_y^z + C_z)} \qquad (8)$$

Fig.11 shows the simulated SSIM values for H.264 codec and H.263 Codec .Obtained results show that H.264 codec gives better result in comparison to H.263.

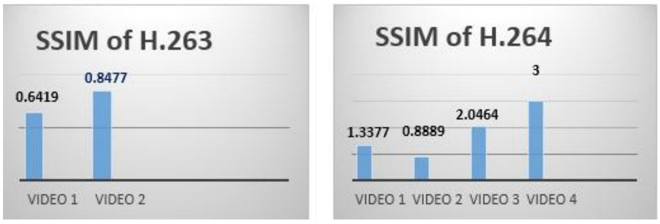


Fig.11: SSIM Graph of H.263 and H.264

Table -III: Resultant Parameters

Methods	Input	MSE	PSNR	Entropy	SSIM	EC
Existing H.263	Video1	0.5871	60.7380	0.0081	0.6419	120000
	Video2	0.5872	60.7373	0.2400	0.8477	120000
Proposed H.264	Video1	0.5878	98.5692	5.9260	1.3377	185625
	Video2	0.6432	98.1783	6.5367	0.8889	185625
	Video3	1.5193	94.4452	5.1815	2.0464	185625
	Video4	0	0	0	3.0000	185625

Table-III: Depicts the comparison between proposed and existing technique with various parameters like mean square error (MSE), peak signal-to-noise ratio (PSNR), entropy, and structural similarity index (SSIM) and embedding capacity.

VI. CONCLUSION

H.264/Advanced video coding is the recent trend in the video coding technology. Inevitable transmission of compressed video content over any medium is a challenging task. In this paper , RDH based scrambling technique is proposed for increasing embedding capacity and bit error rate using H.264 coder/AVC. At the encoding end, input video I-frame and P-frame are compressed using QP=27and chaos encryption technique is employed for embedding secret data. At decoding end, embedded information is extracted to recover compressed video frame. The encoding efficiency, peak signal to noise ratio and embedding capacity of H.264 is much higher than that of the previous encoding techniques such as H.263/MPEG3. Main objective of video coding is compression and decompression that is mainly used to manipulate video signals to reduce bandwidth and the memory required without compromising on the video quality. The experimental results shows that the proposed model is very efficient in embedding information into video frames and can supports multiple videos because of larger prediction units, costly motion estimation and improved flexibility. However proposed method still needs improvement in order to control increase in bitrate which will be future enhancement.

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