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Secure Video Monitoring System Using Haze Removal

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ABSTRACT: A solid technique for dehazing picture and video was proposed. The objective is to accomplish great dehazed pictures and recordings with appropriate security at the recipient side. The picture was dehazed by dull channel former. The framework taking into account quick single picture dehazing and here the codes utilized are joint photographic master gathering. At that point the packed picture is stretched out to compacted video, by utilizing codecs H.264. At that point by considering the dehazing impacts before or after pressure, the coding antiques and movement estimation were explored. Before pressure deliver better dehazing execution with less antiques and preferable coding proficiency over after pressure. By utilizing these techniques, the thickness of cloudiness and dimness free pictures and recordings can be evaluated specifically. At that point a watermark is included for advanced right administration and the watermarked picture and recordings is encoded with a quick and dependable light weight calculation. This picture and video is transmitted to the recipient side. At the beneficiary side, the utilization with right key can decode the picture and the picture will be watermarked with watermark image, the watermarked picture can be utilized to follow illicit conveyance. Consequently this framework creates a dehazed picture and video with high secure and quick transmission.

KEYWORDS: Dehazing Watermarking, Rate-distortion, and Key-management.

I. INTRODUCTION

Haze is traditionally an atmospheric phenomenon where dust, smoke and other dry particles obscure the clarity of the sky. This paper presents a combination of special methods for pre and post processing of still images and videos, aimed at compression ratio enhancement and quality improvement of images and video. The preprocessing is based on the image and video restored before compression and the post processing restored after compression. Secure transmission of digital video has long been a top priority for Military application, and is an increasingly important issue for commercial TV Broadcast and network- based multimedia applications. Such as HDTV (High Definition Television),VOD (Video on Demand), PPV (Pay per View), DVD (Digital Video Disk), online video games and so on. Inspection II, will give an overview of haze removal of secure remote surveillance system, which is used to protect the dehazed image and videos. In section III, to investigate what happens the images and videos, when it is applied pre and post compression. In section IV, secure remote surveillance system produces based on key code water marking, which is used totrceillegal distribution. Then follow with section V, discussed the result for subjective and objective analysis. Then conclude this paper in section VI.

II. OVERVIEW OF THE SYSTEM

The inter-frame motion for dehazed images developed the technique based on dividing a frame into smaller rectangular blocks and finding the direction of minimum distortion (DMD) for each block [1]. To reduce the blocking artifacts, the human visual system (HVS) method will be used [2].The most commonly used methods for image compression are closed-form expressions for compressed medical images. It require large amount of memory space [3].Gary level grouping (GLG) is a general and powerful technique and it used to apply to a broad variety of low contrast images [4].The extension of basic GLG algorithm used to break the gray scale into two or more segments and each segment perform the basic concept when to treat the X-ray images [5]. To enhance the contrast DCT domain, the

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simple, adaptive and easy to implement with great potential for enhancing the quality of medical images are used [6]. The selective encryption algorithm is used to secure the MPEG transmissions [7].The problems of the MPEG video encryption algorithm are discussed by using random permutation list instead of zigzag order within the MPEG compression [8].The two way selective encryption algorithm for the video is developed to compromise the security and speed in the process of encryption [9].To keep continuous security, key management is also an essential part of the system, that needs three kinds of keys [10]. A dark channel prior is used to remove the haze from single input image [11].The overview of H.264/AVC is used to achieve a significant improvement in rate distortion theory [12].The new motion compensation technique is used to overcome the large calculation of time complicated motion vector prediction algorithm [13].The adaptive fuzzy filter improves both visual quality and PSNR of compressed images and videos[14].The formation of a haze is contributed by direct attenuation and absorbed other directions[15].The scrambling key is used to conjunction and protecting the digital video streams from unauthorized viewing [16].

III. HAZE REMOVAL ON IMAGE AND VIDEO CODING

In fig 1 represented the block diagram for haze removal of image and video coding. Here the input of image/video is in the form of haze. Then the dehazing applied two different methods. First approach is pre compression; it means the dehazing technique applied after compression. Dehazing techniques are dark channel prior and median dark channel prior. Then the result applied to compression standards for image in JPEG and video for H.264. The post compression is first input image/video applied to dehazing techniques before compression. The ringing and blocking artifacts can be reduced by choosing a lower level of compression. They May be eliminated by saving an image using a lossless file format. So, the pre compression is gives better performance and fewer artifacts than the post compression.

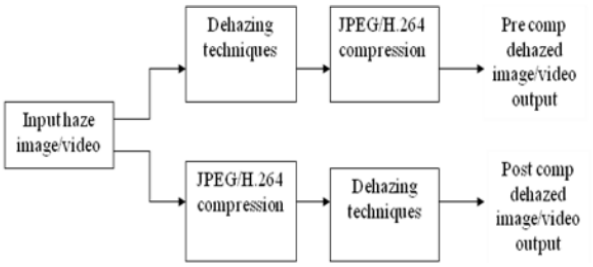

Fig.1: Haze removal on Image and video coding

A. Dehazing Techniques

In image, the fast single image dehazing techniques are used. Here the dark channel prior is simple but effective image prior. The concept of dark channel is an arbitrary image channel is J^{dark} is given by,

$$J^{dark}_{y \in \Omega(x)}(\min_{c \in \{r,g,b\}} J^c(Y)) \qquad (1)$$

Where, J^c is the color channel of J and is a local patch centred at x. the intensity of J"s dark channel is low and tends to be zero: This is called by dark channel prior. The DCP is constructed

$$\Theta_D(m,n) = \min_{k,l \in \Omega(m,n)} \left(\min_{c \in \{r,g,b\}} \frac{\hat{x}(k,l,c)}{a(c)} \right) \quad (2)$$

asBut the DCP has the limitation of halo effects for not refining. So, the initial atmosphere scattering light through median filtering is included, to refine the transmission. Compared with DCP dehazing methods, the MDCP method could get a better dehazing effect at distance scene and places. The proposed MDCP constructed as,

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$$\Theta_M(m,n)=\underset{k,l\in\Omega(m,n)}{\text{med}}\left(\min_{c\in\{r,g,b\}}\frac{\hat{x}(k,l,c)}{a(c)}\right) \quad (3)$$

In video dehazing, the compressed image was extended to compressed video. The video sequences are plays an important role in commonly used codecs e.g., MPEG-4 and H.264. A block matching algorithm is the popular choice of reducing temporal redundancy between frames in video compression. Then by apply the MDCP method on a video sequence before and after compression. Here using codecs are H.264 with varying bitrates.

B. Compression Standards

In this haze removal of image and videos technique, joint photographic expert group (JPEG) and H.264compression standards are used. Compression technique is used to reduce the block size of image and videos. The JPEG compression is used in a number of image file formats. It is most common format for storing and transmitting photographic images on the World Wide Web.H.264 is currently one of the most commonly used formats for the recording, compression and distribution of high definition video. It is a block- oriented motion compensated-basedCodecstandarditisalsowidelyusedbystreaminginternetsourcessuchasvideos.

C.PSNR Performance

Two common measures of image quality are the mean square error and peak signal-to-noise ratio. The PSNR is an engineering term for the ratio between the maximum possible power of a signal and the power of corrupting noise that affects the fidelity of its representation. It is most commonly used as a measure of quality of reconstruction of loss compression code. The signal in this case the original data and the noise is the error introduced by compression. The PSNR is most easily defined via the mean squared error (MSE), which for two mxn monochrome images I and K where one of the image is considered a noisy approximation of the other is defined as,

$$MSE=\frac{1}{mn}\sum\sum[I(i,f)-K(i,f)]^2 \quad (4)$$

The PSNR is defined as,

$$PSNR=10.\log_{10}\left(\frac{MAX_I^2}{MSE}\right) \quad (5)$$

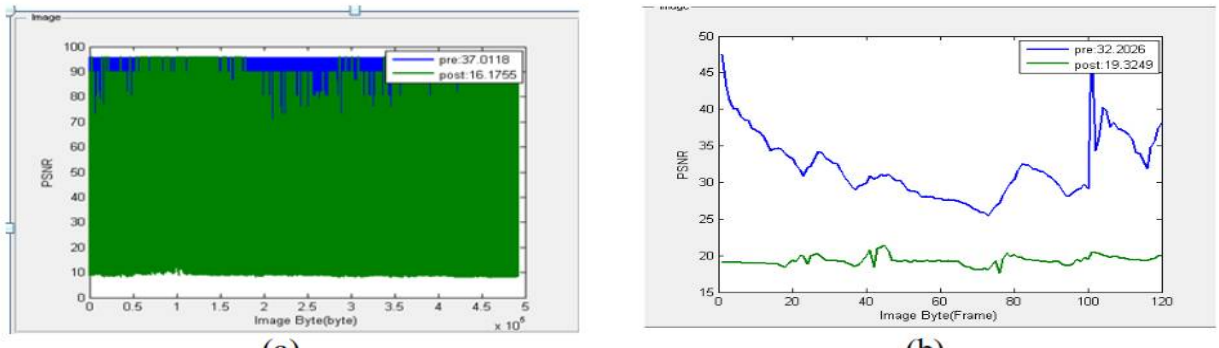
$$=20.\log_{10}\left(\frac{MAX_I}{\sqrt{MSE}}\right) \quad (6)$$

$$=20.\log_{10}(MAX_I)-10.\log_{10}MSE \quad (7)$$

Here, is the maximum possible pixel value of the image. The PSNR is usually expressed in terms of the Logarithmic decibel scale.

IV. OBJECTIVE ANALYSIS

In this section the objective measures was performed and the PSNR for the image and video was calculated and Represented in graphical form.



(a) (b)

Fig.2: Objective analysis, (a) PSNR of Dehazed Image, (b) PSNR of Dehazed Video

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V. CONCLUSION

The dehazing performance for image and video coding system was discussed to decide Pre or Post method for enhancing and compressing video for a surveillance application where fog and haze are prevalent in the atmosphere. Then the proposed dehazing method produced very few artifacts, fast and better performance for image when JPEG compression and video coding method when H.264 video sequences is used. Then the simulated results confirmed the analysis. In next phase, the concept of watermark and encryption were added to this dehazed image and video for digital right management, by using a fast and reliable light weight algorithm. Finally the image and video can be used to trace illegal distribution. Thus the resulting system produces a dehazed image and video with high security and fast transmission.

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