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DATA MANAGEMENT SYSTEM FOR HOSPITALS BY INSERTING DATA IN A LIVE VIDEO USING WATERMARK

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Abstract: In the advanced growth of Internet, sharing a medical data securely to the required network has never been easier task. The proposed Data Management system, aimed at preventing the modification of data in Hospitals. With the rapid growth of Internet and networks technique, multimedia data transforming and sharing is common to many people. Multimedia data is easily copied and modified. This paper proposed a blind watermarking algorithm for embedding and transferring a medical data securely over the required network. This work insisted with a "Text Watermarking" embedded into YC_BC_R (Y- luma component, C_B –blue difference, C_R- red difference) color channels of each medical video frame using Discrete Wavelet Transform and Principle Component Analysis. This paper also details the way in which the watermark includes the electronic records of the patient arrived into the hospital with three different sizes and around 146 characters will be embedded into medical video frame. It is in general that high capacity watermarking scheme mostly preferred in telemedicine application. In this project work, privacy and security problem is attended and the problem can be rectified by the way of embedding a data into a specific video. The proposed scheme is imperceptibility, robust, secure and it has good performance compared with previous data management systems.

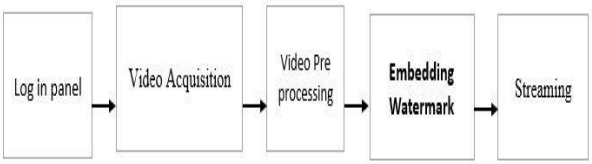
Keywords: Medical data sharing, Data communication, Blind watermarking, Text watermarking, Discrete wavelet transform, Principle Component Analysis

I. INTRODUCTION

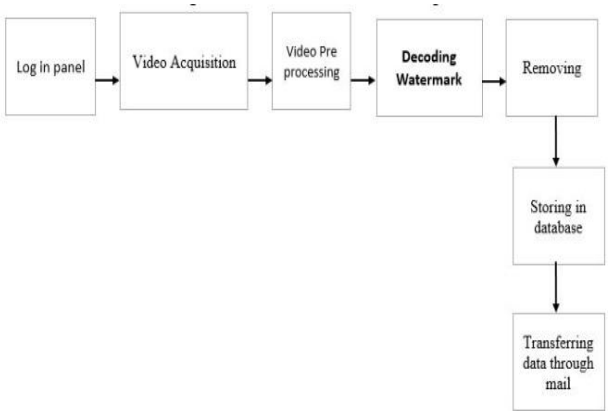
The process of Digital Watermarking involves the modification of the original multimedia data to embed a watermark containing key information such as authentication or Copyright codes. The embedding method must leave the original data perceptually un-changed, yet should impose modifications which can be detected by using an appropriate extraction algorithm. The main purpose of the watermark is to identify who the owner of the digital data is, but it can also identify the intended recipient. The aim of paper is Unauthorized accesses of a medical data in hospitals are a human tragedy. They involve high human suffering. To overcome this problem, the medical data embed in a video are important information in the emergent situation. Digital watermark is a digital signal inserted into digital content. The digital content could be a still image, audio clip, a video clip, a text document or some form of digital data that the creator or owner would like to protect. With the technology advancing on one side, so has the rate of threat to hack, tamper or steal the data that is being transmitted over the public also increased in leaps and bounds. Multimedia data is easily copied and modified, so necessity for Copyright protection is increasing. Digital Watermarking has been proposed as technique for Copyright protection of multimedia data. DWT (Discrete Wavelet Transform) in conjunction with PCA (Principle Component Analysis) transform are used in the embedding process to get the best location for hiding the Watermark. Hiding data in a video using watermarking technique is becoming one of the most rapidly advancing techniques in the field of research especially with increase in technological advancements of Internet and multimedia technology. This project is imperceptibility, robust, secure and it has good performance.

II. PROPOSED SYSTEM

If the data embedded in a video is visible to others, then the attackers can easily hack the data by using the decoding technique. To solve this problem the medical data can be "Hiding from View in a Video". Then the patient information can be send to other doctors through email.



a) Flow Process for embedding the watermark Templates



b) Flow Process for Removing and transfer the watermark Templates

III. METHODOLOGY

The theme of the project is preventing unauthorized persons to access the medical data in hospitals and to secure the life of patients. Most of the unapproved data accesses in hospitals are due to privacy and security problems. Those problems are prevented by embedding the medical data directly in a live video through web camera. Immediate action of storing a medical data securely in a video will save many patients life.

IV. LITERATURE SURVEY

[1] A Simplified Nonlinear Regression Method For Human Height Estimation In Video

Authors: Shengzhe Li[1], Van Huan Nguyen[2], Mingjie Ma[2], Cheng-Bin Jin[1], Trung Dung Do[1] and Hakil Kim[1]

Year: 2015

Advantage:

- This paper presents a simple camera calibration method for estimating human height in video surveillance.
- It is possible to retain only three calibration parameters in the original camera model, namely the focal length, the tilting angle and the camera height.
- These parameters can be directly estimated using a nonlinear regression model from the observed head and foot points of a walking human.
- With only three unknown parameters, the nonlinear regression model can fit data efficiently.
- The experimental results show that the proposed method can predict the human height with a mean absolute error of only about 1.39 cm from ground truth data.

Disadvantage:

- Several camera calibration methods based on walking humans have been proposed.
- Most such methods rely on estimating vanishing points from walking human.
- However, as Micuisik et al. reported, estimating the vanishing points is usually the bottleneck of these methods because it is extremely sensitive to noise.
- Vanishing points are difficult to compute

[2] A Fast Compressive Sensing Based Digital Image Encryption Technique Using Structurally Random Matrices and Arnold Transform

Authors: NitinRawat, Pavel Ni, Rajesh Kumar

Year: 2013.

Advantage:

- Considering the natural images to be compressed in any domain, the fast compressed sensing based approach saves,
  - Computational time
  - Increases the quality of the image
  - Reduces the dimension of the digital image by choosing even 25 % of the measurements.
- Experimental results including peak-to-peak signal-to-noise ratio between the original and reconstructed image are shown,
  - To analyze the validity of the digital image encryption technique.
  - It demonstrates about the proposed method to be fast, complex and robust.

Disadvantage:

- Privacy problems
- Low capacity
- Security problems

V. EXISTING SYSTEM

The existing work proposes a blind watermarking algorithm for transferring medical data securely over the public network. A text watermark is embedded into (YCbCr) colour channels of each medical video frame using Discrete Wavelet Transform and Principle Component analysis. The maximum PSNR achieved by the proposed technique is 61 db while the least is 45 db. The maximum number of characters embedded in the medical video frame is 146 characters.

Advantages of Existing System:

Embedding Process: Embedding process includes the following modules for appropriate embedding of watermark into the electronic patient record.

Framing: Framing is a process by which the video is segmented into frames, wherein each frame is embedded with watermark. The video are divided into frames (2n x 2n), and then convert RGB frames into YCbCr frames.

Discrete Wavelet Transform: If maps of a function of a continuous variable are expanded in a sequence of number the resulting coefficients are called discrete wavelet transform. Choose the luminance component Y of each frame apply DWT on it .this result in four multi- resolutions sub-bands (N X N): LL1, HL1, LH1 and HH1. For each band apply DWT again to get 16 sub –bands (N/2 X N/2). For each band in the 16 sub-bands, apply one more DWT to get 64 sub-bands each is (N/4 X N/4).

Principle Component Analysis: Principle Component Analysis is the process by which the exact location for embedding the watermark is found. More specifically we use the concept of block based PCA, where each frame is divided into blocks and then PCA is applied so that finding the exact location becomes and easier process.

Watermark Preperation: The medical information is inserted into a text file .This text file is then converted into binary form, according to text file generate a watermark image and then convert the binary image into vector of zeros and ones.

Data Extraction Process: Initially convert the watermarked video into YCbCr frame. For each Y, Cb, Cr component apply DWT to decompose the channel into 64 multi-resolution sub-bands. Divide each sub-band into n x n non-overlapping blocks. Using second secret key extract the watermark. The extracted watermark is compared with the original watermark by computing the similarity between them.

Disadvantages Of Existing System:

- Difficult to embed a large amount of medical data into a specific video. Specifically, if one wants to hide a secret data into a video, the secret medical data must be highly compressed in advance.
- If the data embedded in a video is visible to others, then the attackers can easily hack the data by using the decoding technique.
- Only a certain amount of characters can be embedded in a video. It will cause some of the important medical data cannot be stored in a specific video.
- Privacy and Security problems, Blendness can be occurred due to the unauthorized access of medical data in hospitals.

VI. PROPOSED SYSTEM

The proposed Data Management system, aimed at preventing the modification of data in Hospitals. With the rapid growth of Internet and networks technique, multimedia data transforming and sharing is common to many people. Multimedia data is easily copied and modified. This project work proposed a blind watermarking algorithm for hiding and transferring a medical data securely over the required network used by the doctors of Government hospitals. This work insisted with a "Text Watermarking" embedded into YCBCR (Y- luma component, C_B –blue difference, C_R- red difference) color channels of each medical video frame using Discrete Wavelet Transform and Principle Component Analysis. This paper also details the way in which the watermark includes the electronic records of the patient arrived into the hospital with three different sizes and around 146 characters will be embedded into medical video frame. The proposed technique can achieve maximum PSNR of 61 dB (decibel) but in normal the least is found to be 45 dB(decibel).It is in general that high capacity watermarking scheme mostly preferred in telemedicine application. In this project work, privacy and security problem is attended and the problem can be rectified by the way of hiding a data into a specific video. The proposed scheme is imperceptibility, robust, secure and it has good performance compared with previous data management systems followed for this purpose. This project also supports both government and private sector to detect the obstacle and prevent unauthorized people from accessing the medical data.

Advantages Of Proposed System

- High capacity
- Invisible
- Imperceptible
- Low error probability
- Provide the original data embedded in a specific video
- Robust Video Watermarking (frame averaging, frame dropping, frame swapping…)
- Recoverable from a document
- Data can be removable only by the authorized users.

SOCIAL RELEVANCE AND USEFULNESS OF THE PROJECT:

Most of the unofficial data accesses in hospitals are due to privacy and security problems. Those problems are prevented by "Embedding and Hiding the Medical Data" directly in a video through web camera. This project is mainly concentrating to develop the procedure and prevent any unauthorized accesses in Government hospitals and to transfer the medical data securely to the required network.

VII. CONCLUSION

This paper offered a high soaring capacity watermarking scheme which can be used in telemedicine applications. The algorithm depends on embedding a patient record into medical videos. DWT in conjunction with PCA transform are used in the embedding process to get the best location for hiding the watermark. Different radiological video frames were used for evaluation. The proposed scheme is imperceptible and robust against several attacks and has a good performance compared with previous medical schemes. We believe our scheme will be very useful in many other practical applications, especially to those require user privacy, security and authentication.

VIII. REFERENCES

[1]Shengzhe Li[1], Van Huan Nguyen[2], Mingjie Ma[2], Cheng-Bin Jin[1], Trung Dung Do1 and Hakil Kim[1].A simplified nonlinear regression method for human height estimation in video surveillance. EURASIP Journal on Image and Video Processing (2015)

[2]Zhu Yuefeng 1, 2 , Lin Li 2 ,Hefei University of Technology, Hefei,Kaifeng University, Kaifeng, He Nan, China. Digital Image Watermarking Algorithms Based On Dual Transform Domain And Recovery. International Journal on Smart Sensing And Intelligent Systems Volume 8, No.1, March 2015.

[3]Federica Battisti*, Marco Carli and Alessandro Neri. No reference quality assessment for MPEG video delivery over IP. EURASIP Journal on Image and Video Processing 2014.

[4]Yanmin LUO, Peizhong LIU and Minghong LIAO, An artificial immune network clustering algorithm for mangroves remote sensing, International Journal on Smart Sensing and Intelligent Systems, VOL. 7, NO. 1, pp. 116 – 134, 2014.

[5]Nisreen I. Yassin Nancy M. Salem Mohamed I. El AdawyMedical Video Watermarking Scheme for Electronic Patient Records. International Journal of Computer Applications (0975 – 8887) Volume 76– No.1, August 2013

[6]Pure, A.A. ; Gupta, N. ; Shrivastava, M., Wavelet and fast discrete curvelet transform for medical application,2013 Fourth International Conference on Computing, Communications and Networking Technologies (ICCCNT), pp.1-5, 2013.

[7]Rathi, S. C. and Inamdar, V. S. 2012. Medical images authentication through watermarking preserving ROI.Health Informatics, International Journal (HIIJ), vol. 1,no. 1.

[8]Hajjaji, M. A., Mtibaa, A. and Bourennane, E. B. 2011. A watermarking of medical image: method based "LSB". Journal of Emerging Trends in Computing and Information Sciences, vol. 2, no. 12.

[9]Kumar, B., Anand, A., Singh, S. P., and Mohan, A. 2011.High capacity spread-spectrum watermarking for telemedicine applications. World Academy of Science, Engineering and Technology, vol. 79.

[10]Franc¸ois-Olivier Devaux and Christophe De Vleeschouwer. Research Article-
Parity Bit Replenishment for JPEG 2000-Based Video Streaming. EURASIP Journal on Image and Video Processing
Volume 2009.

[11]Vincent Charvillat, [1] Anna Tonazzini (EURASIPMember), [2] Luc Van Gool, [3], [4]
and Nikos Nikolaidis (EURASIPMember)[5]. Image and Video Processing for Cultural Heritage. EURASIP Journal on Image and Video Processing-Volume 2009

[12]Navas, K. A., Thampy, S. A., and Sasikumar, M. 2008. ERP hiding in medical images for telemedicine.

[13]Chemak, C. , Lapayre, J. C., and Bouhlel, M. S. 2007.New Watermarking Scheme for Security and Transmission of Medical Images for Pocket Neuro Project. Radio Engineering, vol. 16, no. 4.

[14]Gonzalez, R. C., Woods, R. E., and Eddins, S. L. 2004 Digital image processing Using Matlab. Pearson Prentice Hall, New Jersey.

[15]Starck J L, Candès E J, Donoho D L. The curvelet transform for image denoising, IEEE Trans. On Image Proc,vol. 6, no. 11, pp. 131-141, 2002.

[16]Chao, H.M., Hsc, C.M.,and Miaou, S.G.2002.A data hiding technique with authendication, integration, and confidentiality for electronic patient records.IEEE Transactions on Information Technology in Biomedicine,vol. 6,no. 1,46-53

[17]Wakatani, A. 2002. Digital watermarking for ROI medical images by using compressed signature image.International Conference on System Sciences.