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A Water Marking Technique for Secure Sharing Medical Data

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Abstract: In the current open society and with the growth of human rights, users are more worried about the privacy of their own information. This paper focuses on the secure sharing of patient's health data record from home to respective hospital using WBAN .while sharing this information security must be provided to the health records. Alteration in the readings may lead to incorrect medical treatment .so one has to provide secure communication; it is achieved by applying digital watermarking technique. Robustness and confidentiality can be achieved by using this technique. The bio-signals such of semantic fidelity of the data is not affected the watermark cannot be corrupted easily.

Keywords: Wireless body area network, health data record (Medical data), water marking, secure data sharing;

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I.   INTRODUCTION

A linear programming based technique for watermark bio-signal data obtained from BASN'S for the securing and safe sharing of data. Necessarily watermarking technique provides robust watermarks by this data is corrupted easily, erased or spoofed by malicious data consumers. This technique is very strong concept by adding lot of challenges in detecting such hidden and encrypted data. The main challenge is high hiding capacity and imperceptibility.

1.1   Need for watermarking.

Today providing confidentiality to the data is more important and the demand for providing security is in high. Water marking technique one among the security providing technique, which is used in secure transmission of images, video and data. This technique is implemented in transfer of medical information of the patients to the hospital for necessary treatment, which makes patients free from medical surveillances and hospital will be receiving update information of the patients without any malicious data.

II.   LITERATURE SURVEY

2.1 Wireless Body Area Network

Wireless body area network monitors the personal health issues using sensor nodes which are easy wearable and portable to certain distance using base station [1] .It is reliable.it adopts RF Technology that operates in industry medical and research scientific centers. WBAN are battery driven sensor device .it increases speed, accuracy, consumes less energy and provides reliable communication .in terms of medical field patients will not be under any surveillance, they can be in normal environment no need to be conscious about the diseases .Sensors are deployed on the patient's

body, they monitor and record the vital signs of patients in health care monitoring system
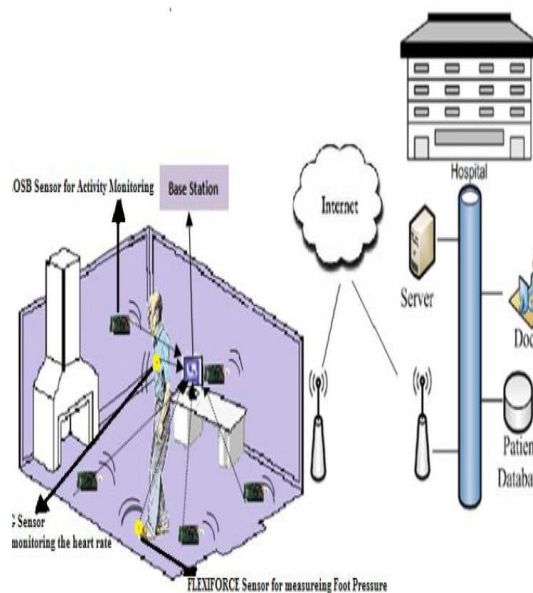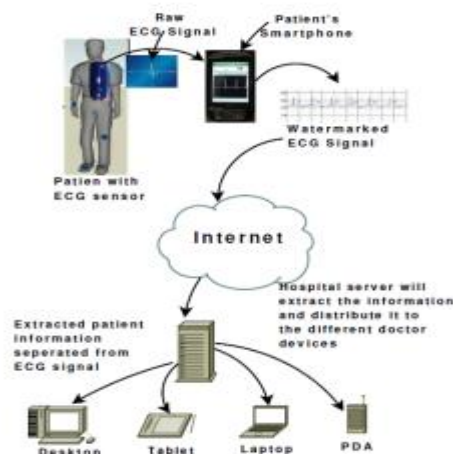

Fig 2.1 Wireless body Area network.

2.2 Digital Watermarking Technology

Covering the patient's information in the cover image is one of the applications of water marking technique [2].this provides data ownership, copyright assertions and securely sending   data.

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Water marking technology comes under the domain of steganography which provides robustness as priority.

Fig 2.2 Watermarking ECGs in Body Sensors Enabled Mobile Health Care Systems

2.3 Content Authentication

Content Authentication provides the trueness of the data [3]. By evaluating the identity of the person .Content Authentication can be achieved using many algorithms Water Marking is the most popular algorithm used in this. Other algorithms that can be used for content authentication are

i. Content based zero watermarking algorithms.
ii. A new feature based image content authentication algorithm
iii. A secure perceptual hash algorithm for image content authentication

2.4 ECG Signal preprocessing

Collect the ECG signal from patient's body and send that signal through wireless sensor networks and converting them to binary values [4]. Apply discrete wavelet based water marking technique for obtained ECG signal four sub bands are involved LL,LH,HL,HH and values are reconstructed into binary values .IDWT technique is applied to get back the original ECG signal.

2.5 Discrete Wavelet Transmission

This is being immersive use for image coding .it decompose the signals into different levels of sub bands[5] .the decomposition of the image is done by 2-level DWT .In first step compute the DWT output along with the rows and in second step compute DWT with column achieving first level decomposition.
Inverse discrete wavelet transmission is applied to reconstruct the original image by applying inverse technique.

2.6 Singular Value Decomposition

In this technique signal processing is done mainly. It is robust and imperceptible to form single value matrix we apply this technique.

The properties of SVD in digital watermarking are
1. Small or minor variation does not affect the original quality of the image.
2. High stability can be attained
 A digital image can be presented in matrix format with its entries giving the intensity value of each pixel in the image.
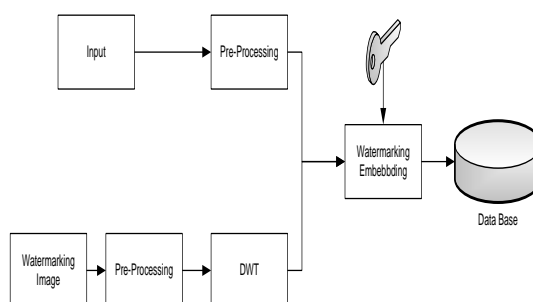
III. PROPOSED SOLUTION

This paper proposes Water marking technique which is generally used to hide original data; this technique is used for medical data sharing in a secure way by implementing cover image and water mark image. The algorithm used for secure transmission of data is encoding algorithm, this encoding algorithm used in watermarking. ECG signals as LSB encoding technique. This compress header fields where the values do not alter during communication between packets.

Initially the values will be in decimal format it is converted into binary and then to string value comparison. The comparison is done between watermark image and bio signal (ECG SIGNAL)

ENCODING ALGORITHM
- Browse the cover image from the dataset, read the image.
- Apply 2d- DWT technique which in turn separate red, green and blue planes.
- Apply singular value decomposition for all planes
- Fetch the watermarked image and again apply 2d-dwt technique
- Find watermarking image for this 3 planes by applying threshold values
    $V3=v1+0.10*v2$
     $V4=v2+0.10*v3$ $V5=v3+0.10*v1$
- Combine these planes SVD values and apply inverse 2D DWT Technique
- Return watermark image to server
- Apply IDWT technique for extraction of original image from server.

Architecture

Fig: 3.1 Privacy sharing architecture

A secure transmission is carried out by using this watermarking technique; one can achieve data ownership, privacy of data and secure sharing.

IV. CONCLUSION

This technique provides controlling in packet loss and packet reordering using least significant bits encoding.it increases the performance of the system during encoding and also decoding of the image. Impairments are considered on both sides of embedding and extraction.ECG signal from the water mark signal can be obtained without any distribution or fault tolerance in the ECG signal. High level of security can be attained and storage space can be minimized. High confidentiality by hiding the patient's original data. Small alteration in ECG signal will not affect the utility of ECG signal.

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