Secure Data Transmission Using Wireless Data Transmission and Face Detection

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Abstract—Mainly focus on the need of a flexible and low cost biometric security system. The natural choice for data transmission of the wireless sensor network is its flexibility. Swarm intelligence (SI) is used to optimize routing in distributed time varying network. In this paper, while consuming minimal energy SI maintains the required bit error rate (BER) for varied channel conditions. A specific biometric, the face recognition system, is discussed as an example. Simulation shows that the wireless sensor network is efficient in energy consumption and the wireless face recognition system is competitive to the traditional wired face recognition system in classification accuracy.

Keywords- *Radio Frequency Identification; Face Detection; Wireless Communication;*

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I. INTRODUCTION

The security of data while transmission is very essential. There is Two Way Security System which is being proposed, which consist of wireless data transmission and detection of face, to improve the security of the system. The legitimate access increases risks that are associated with wireless data transmission. This security system can be used at places where the data is highly confidential. This paper relates to the security of data communication in wireless system and particularly to a system where encryption key is used by a transmitter and receiver to provide a secure system .Data transmission is done using the technology called as RFID.RFID is used for identification of the automated objects and other creatures by using the short range radio technology for the communication of digital data in between a non-movable location and a movable creature. Keeping in mind the security of data and to provide secure transmission, Two Way Security System is being proposed, which comprises of wireless data transmission and face detection, thus enhancing the security of the system. Since the security risks are always associated with the wireless transmission which may occur due to any unauthorized access. This security system can be used at places where the information is highly confidential. Data transmission is done using RFID technology. RFID is used for automated identification of objects and other creatures by using short range radio technology for the communication of digital data in between a non movable location and a movable creature. RFID has come up with various applications along with numerous risks. Now a day RFID systems are seen almost everywhere for example product tracking, inventory control, access control etc. A wireless network is vulnerable to all exploits targeted at wired networks with a weakness of their own that makes them to susceptible to many more attack [2].

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II. LITERATURE SURVEY

The 802.11 standard for wireless networks includes a Wired Equivalent Privacy protocol, basically used to provide protection to link-layer communications from eavesdropping and other different types of attacks. We have discovered several serious security flaws which are present in the protocol. The flaws in result allows to a number of attacks that demonstrate that WEP fails to achieve its security goals. In recent years, the increase usage of laptop computers and PDA'S caused an increase in the range of places people perform computing by using these devices. At times, network connectivity is becoming an increasingly important part of computing atmosphere. Therefore, wireless networks of various kinds have gained much recognition. But with the added ease of wireless access raises new problems, not the least of which are delicate security concerns. When transmissions are put on air over radio waves, interception and masquerading becomes insignificant to anyone with a radio, and so there is a requirement to make use of additional mechanisms to protect the communications.

III. PROPOSED SYSTEM

Encryption and decryption are done using a variable called key. A key is long sequence of bits used in cryptography algorithms. During encryption the algorithm changes the original data based on the key's bits to create a new encrypted message and when the data reaches to its destination, the same sym-metric or asymmetric key is used to decode the encrypted message turn into its original form. With the help of RF technology wireless communication is added with 12 bit password protected data transmission. The data is reached to the receiver whose address is matched by the transmitter address.

In case the user wants to display the same message on both receivers then the same address can be set for each receiver.
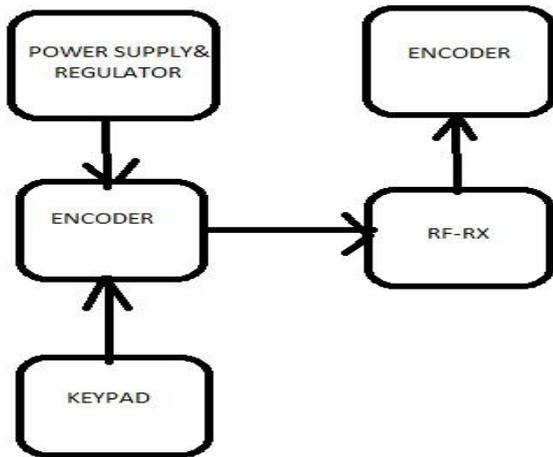
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Fig: Schematic diagram of Transmitter

Thus the system provides full security and along with this now the face detection technique is being merged which ensures that the data is not received until and unless the face detection is done effectively. At the receiver side the data is not retrieved even if the password is matched until the face detection is done. If the image is matched with the previously defined data base the detection is valid & justified which further allows displaying the information.
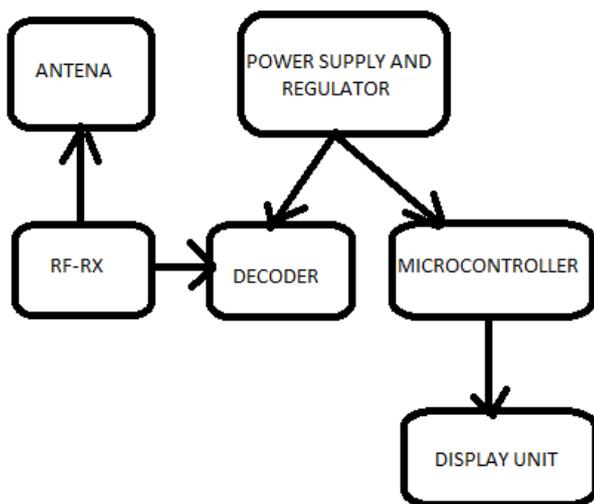

Fig: Schematic diagram of Receiver

At the receiver end the data is not retrieved even if the password is matched till the face detection is done.
If the image is matched with the previously defined data base the detection is done successfully which further allows displaying the information. For the face detection purpose MATLAB algorithms are used. There are various steps implicated in face detection; it detects the facial features from the image of the face. The algorithms which are used now a days are 10 times more accurate and efficient than those that were used earlier. Thus it ensures better security with

improved performance [3]. Thus Face Recognition has always been the basis of several security systems

IV.   WIRELESS DATA TRANSMISSION

This paper relates to the security of data communication in wireless system and particularly to a system where encryption key used by a transmitter and receiver may be reprogrammed manually in order to provide a secure system [4]. Data is transmitted through wireless technology which ensures improved efficiency and convenience which leads to enormous growth in the segment of communication industry. Here the data is 12 bit password protected. RFID technology is being used for data transmission which involves RF Transmitter and RF Receiver. RFID has a more limited range as compared to a centrally located transreceiver, and therefore it is less prone to hacking from any suspicious source [5].
The transmitter sends the encoded signals and the receiver receives the encoded signals. In the transmitter a unique code is created that is used to identify the RF signal. This paper gives information about the security of data communication in a wireless system and particularly to a system where encryption key used by a transmitter and receiver may be reprogrammed explicitly in order to provide a secured and a full proof system. Data is transmitted through wireless technology which ensures exact and improved efficiency which leads to large growth in the segment of communication industry. RFID technology is being used for data transmission which involves Radio Frequency Transmitter and Radio Frequency Receiver. RFID does not have more range as compared to a centrally located transreceiver, and therefore it is less prone to hacking from any illegal source.

Fig3- Wireless Transmission

The transmitter sends the encoded signals and the receiver receives the signal which has been encoded. In the transmitter a unique code is created that is used to detect the RF signal. The identification code is the 12 bit password. In order to convert the data into an encrypted data that is to be transmitted over RF channels, encoder is being used. Encoder thus translates the data that is entered from the keypad. This encrypted data is converted in the form of RF frequency. Power supply is to be provided in order to drive the transmitter and encoder. RF receiver decodes the data and displays it on

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the desktop. At the receiving side decoder is used to decrypt the data and then provided it to the micro controller. This technicue of wire-less data transmission system is conveniently useful in every way. And for better security as per keeping the transmission safe from intrusion we are using the technique of RFID.

V. TECHNIQUE OF FACE DETECTION

The Facial Recognition System is application typically used for the identification and verification of a person automatically from an image or a video frames. The face detection technique uses some of algorithms which help full in identifying the facial features i.e. by extracting the features from an appropriate image of a specific face. Once the data is transmitted and send by the sender, the receiver is not able to retrieve the information till the time face recognition is justified. The process of Face recognition thus gives total security. The face recognition stage typically uses an intensity representation of the image by the 2D-DCT. This system serves for the crime detecting purpose because the pre-recorded images can be afterward used for the identification of a person. The face recognition process includes some important steps to be followed up:

5.1   Detection Method

The computer by itself decides which portion of the pixel to be taken and others to discard.

5.2   Normalization

This means that the image must be accepted in terms of dimensions, posture, etc related to the images in the reference database.

5.3   Face Extraction and Recognition

Feature extraction includes a mathematical representation called as a biometric template, is to be generated, which is stored in the database and forms the basis of any recognition step.

Fig : Face Detection Technique

MATLAB will be used for the face detection technique. The algorithms had been developed through sophisticated mathematical computing matching process for the recognition of the face of any person. The algorithms thus play a very important role in the case of face detection using MATLAB technique. The communication that involves internet or any external network needs security. Encryption of any algorithm has many purposes like:

1- Security and Proprietary
2- Integrity
3- Legal Activities.

We even have different kind of algorithms which can be used in the face recognition process, for e.g. Symmetric Algorithms, Asymmetric Algorithms, Hash Algorithms, etc. [6]. The face recognition algorithms are highly depend on the detection of the facial features but in the different approach that is being used here, face is treated as a general pattern and is recognized by its photometric characteristics. To implement this approach algorithms are to be implemented.

Fig: Working procedure

The face recognition algorithm are highly dependent on the detection of landmarks i.e. the facial features but in the different approach that is being used here, face is treated as a general pattern and is recognized by its photometric characteristics. To implement this approach algorithms are to b created.

1. PRINCIPLE COMPONENT ANALYSIS (PCA):

The PCA technique converts each two dimensional image into a one dimensional image vector. The obtained vector is then decomposed into orthogonal (uncorrelated) principal components which are also known as Eigen faces, the technique selects the feature of the image (or face) which vary most from the rest of the image.

2. LINEAR DISCRIMINATE ALGORITHM (LDA):

LDA is a statistical approach based on the same statistical principals as PCA. Based on a set of training images of known individuals, LDA classifies faces of unknown individuals. The technique finds the underlying vectors in the facial feature that
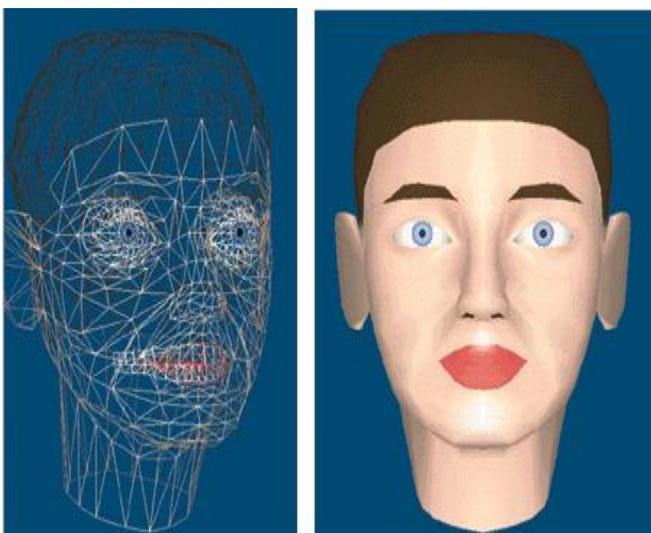
would maximize the variance between individuals and minimize the variance within a number of samples of the same person.

3. ELASTIC BUNCH GRAPH MATCHING (EBGM):

EBGM basically depend on the concept that real face images have many non-linear characteristics that are not addressed by the linear analysis methods such as PCA and LDA-such as variations in illumination, pose and expression.

The EBGM method places small blocks of numbers (called "Global Filters") over small area of image, multiplying and adding the blocks with the pixel values to produce numbers (referred to as "jets") at various locations on the image. Using all these algorithms, face detection can be done easily and in an effective manner which results in better security to a specified area or network efficiently.

VI. CONCLUSION

Thus wireless data transmission by using RFID technology along with face detection in MATLAB .By combining the two systems it will be beneficial to obtain good security in any geographical area and location. The valuable data when send across the network will be secured by the use of radio frequency security mechanism and can only access at the other end by using face detection method. As the system have

prerecorded images to scan from the given database the probability of error is minimize to a large extent thus giving us value of security and protection.

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