Biometric System of a Human: A Review

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Abstract-Human Heart Sound is unique in nature. It helps to regulate the pumping blood to the rest of the organ system for proper function, so that that pumping blood abruptly passes through the heart chamber to create heart sounds which are sounds as LUB and DUB via closure of Bicuspid and Tricuspid valve. These sounds having two segments S1 belongs to first sound and S2 belongs to second sound.

I. INTRODUCTION

Generally biometric itself means related with living thing as we human being , although we are having different types of biometric traits such a heart sound, Iris, Retina, face, fingerprint etc. All biometric attributes playing dissimilar role for their recognition. No such human being having same biometric traits. Sometimes same feature of Iris, face, but Heart sound is uniqueness in nature, no one duplicate it. Biometric identifiers are the distinctive and measurable characteristics used to label and describe individuals identity. Biometric identifiers are often categorized as physiological versus behavioral characteristics. A physiologic biometric should be identify by iris scan, DNA or fingerprint. More traditional means of getting at control including the nominal-based identification systems, such as a driver's license or passport, and knowledge-based identification systems, such as a password or personal identification number. Since biometric identifiers are unique to every individuals, they are more honest in verifying identity than token and knowledge-based methods, however, the collection of the biometric identifiers arouses secrecy concerns about the prime use of this information.Biometric authentication processes comprising of two phases. In first phase the database is made where the feature sets of Heart sound of each individual is stored. In second phase the extracted feature sets are compared with the feature templates stored in the database to find a match.

Now a days, Crime is growing very fast in our world. To identity the suspect behind it. We have to identity through by our memory based picture. Or any other means of photograph and through different person claiming for that. This type of system already present in police department for thief to identity. If we make the data base of all the previous visited thiefs with their every means of biometric identification i.e, Fingerprint, Face, iris, and DNA etc. The process of identification can be realized from how a crime defendent is known by a witness. Witness's job is to find out the criminal among the suspects on the basis of the physical assign that is stored in his memory. In biometric system the classifier is first trained with the features of the different classes. Feature extracted from the query sample is matched with the stored classes and finally a conclusion is made about which class of query sample going to match first.

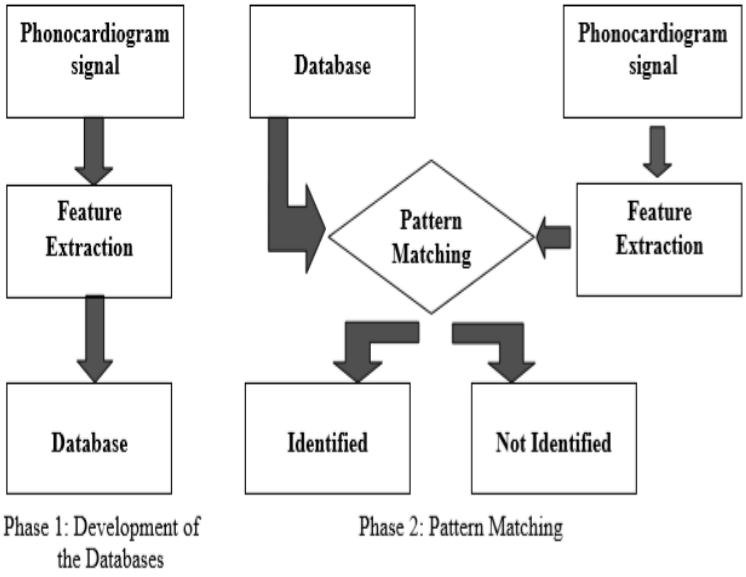

Fig.1: Two phases of Biometric Authentication System.

Salient Features of heart Sound as Biometric-

A. Distinctiveness. Two persons should be different in terms of the characteristic property.
B. Permanence. The characteristic should be sufficiently in-variant over a period of time.
C. Universality. Each person should be having the unique characteristic.
D. Invariability: The system performance should remain same over a long duration of time.
E. Uniqueness: Every person's Heart Sound is unique in nature.
F. Easy accessibility: The physiological trait should be easily accessible.
G. Collectability. The feature should be quantitatively measurable.

II. LITERATURE REVIEW

Generally why we need feature extraction of any signal? However any kind of signal contains some information in it. The characteristic of signal differ by a single second. To take out the information present in the signal. That process of extracting feature is called feature extraction.

A. Extraction of Feature using LFBC

Feature extraction is the process of extracting useful information from a signal. In this project we require features that can describe the individuality of a PCG signal of a particular person. For PCG signal frequency ranges from 20-200 Hz in frequency .

B. Block diagram of LFBC based feature extraction

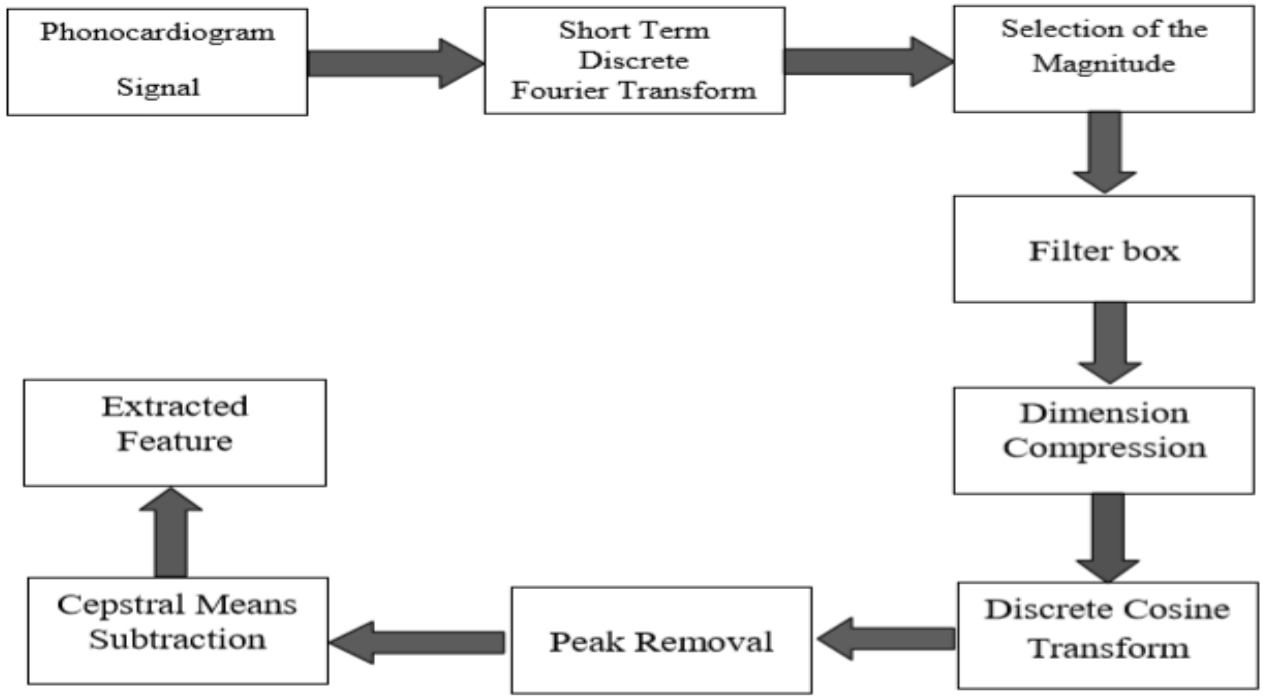

Fig.2: Block diagram of the LFBC feature extraction process

III. METHODOLOGIES

The following methods are adopted in Artificial Neural Network

The fundamental element of an ANN is called nodes. Nodes act like artificial neurons which is generally same as natural neurons. This concept is initiated by real neurons present in the nervous system.

Structure of a single node

Activation function can be settled or it can be the probabilistic. Most popular and commonly used activation function is sigmoid function.

A. Multilayer Network

Generally Neural Network are made up of multiple hidden layers of nodes or artificial neurons same as our neuron in brain. The overall function of this hidden layer is to make the network output follow the desired form. The network with the multiple layer can follow higher order statistics.

B. Training the feature vector

Training is the process of obtain the desired output when certain inputs are provided. Neural Network weights are corrected according to the error signal rendered. The error can be built in lots of ways. In the easiest form it is the difference between the desired output and actual output.

C. Algorithm of Back Propagation

The instant value of the error energy obtained from the adding the mean individual error energy of a single node over all neurons in the output layer

D. Perceptron A detailed of Multilayer Perceptron ANN structure and the algorithms are given.

IV. CONCLUSION

A novel technique has been used with linear frequency band cepstral based feature set for automatic identification system. The PCG signal is in time domain, so to convert in frequency domain from STDFT, then the magnitude part is taken and rejecting the phase part, which contain noisy, next the filter bank is applied to remove the high frequency component present in it, although filtering the signal between 20-150 Hz.

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