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HUMAN IDENTITY BASED ON EAR RECOGNITION

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ABSTRACT:
In this paper an overall framework has been presented for personal identification using recognisation system of ear biometric. This ear biometric system uses 2 dimensional discrete wavelet transform as a future extractor. To advocate the applicability of wavelet-transform on ear biometrics, recognition test has been done on our own user defined database. Instead of considering the original signal, we consider the different wavelet decomposition coefficients for extracting features. Empirical experiments have been done after each level of decomposition. You can find the energy in HH HL LH components and for an energy distribution based feature vector, this gives the quantification for the texture information in the input. The extracted coefficients are used to represent the image for classification.
Keywords:HH, HL, LH, Biometric, identification, security.

1. INTRODUCTION

Due to growing of the population day by day a person identification necessity also grows. The advent in the technology helps to identify a person. In general, a person can be identified or noted based on his physical data like identity cards which are provided by government authorities in some cases the company working cards, so whenever a person travels through the world he can be notified by showing his physical identity cards. But the manipulation of physical cards been easy with current development in technology and also from past we seen several conventional means for person identification which includes passport, keys, tokens, access cards, personal identification number (PIN), passwords but these might be lost, stolen and sometimes maybe forgotten for this a new trend has come into force to identify a person by his biometrics. A new security system has developed based on Biometrics using human body parts. Biometrics is the data that was acquired from a person previously by using/capturing his face, iris, fingers for authentication due to its uniqueness of features from person to person. But in many cases like accidents, threatening conditions by terrorists, intelligence surveillance security purposes etc. The person identification through face, iris, fingers will not work because if a person met with a severe accident for face the face/iris recognition will difficult at that time, we used to identify by his finger prints but a person's finger prints might change due to several reasons in several aspects some for based on their work like in construction field with cement works by this some studies confirms that ear could be used for human identification. So in order to verify the person we have another good development in biometrics i.e., 'Ear

recognition'. Ear biometrics plays a predominant role in person identification, the ear has unique features that changes from person to person.

My aim of this paper is to help to identify the person in security aspects as well as in threatening conditions a further research in the development of the recognition systems has to be carried out based on the new era of the technology growth. In this paper a framework has been implemented to carry out the testing of a person authentication in security aspects. A wavelet transform has been used to detect the energy values of the decomposed image based on these DWT extracted features a classifier is used to classify the image frames from the input video dataset. Previously the same work is done by using the LBP. But at the output results the efficiency is low when compared it with DWT. For texture classification a local binary pattern is widely used including face recognition, background removals and selection for region of interest. Sometimes a DWT along with a rotation time invariant LBP has been used for rotation invariant feature extraction instead of Fourier transforms. A DWT has lots of advantages which lie in its ability like breakdown points, self-similarities, discontinuities in higher derivatives and ability of revealing aspects of trends.

2. RELATED STUDY

A word processing of any data is termed as communicating or transferring of the data from one region to another region. A Signal processing is a discipline of engineering and in mathematics which deals with analysis and processing of analog and digital signal and also it deals with the transferring the data, filtration of the data, filtering and storage of data as well as other operations on signals. These signals include transmission of data, sound or voice signals, pictures, and other signals etc.Whenever during a transmission of data occurs then the input chosen to be as an image and the output is also an image which termed as image processing. As the name reflects as an image in input and also it deals with the processing of the images.Based on the transmission type of the data, it is classified into analog image processing and digital image processing.In Analog image processing analog signals are transmitted. Processing of two dimensional signals in analog format of an image is transferred. By varying the electrical signal, the images are manipulated by electrical means in this type of transmission. Television images are the best examples of this type.When compared to analog image processing, the digital image processing is much accurate while transferring along with time due to its wider range of applications.The digital image processing deals with proposing of a digital system which helps to perform operations on a digital image.Image processing is a technique used for to do operations on image, for to get an enhanced image or to extract some useful information from that image then image processing is used to undergo some tasks on that image. It is a type of signal processing in which input and output are to be images or characteristics/features are associated with that image. At present, image processing technology is growing day by day rapidly. The two types of methods used for image processing namely are, analogue and digital image processing. Analogue image processing can be used for the hard copies like printouts and photographs. In order to use these type of visual techniques, Image researchers use various fundamentals of interpretation. Manipulation of the digital images using computers can be processed by using digital image processing. The three

utmost phases that used in digital image processing is, all types of data have to undergo while using digital technique are pre-processing of the image, enhancement of image, and display, information extraction.

Image interpolation occurs when you resize or distort your image from one-pixel grid to another. Image resizing is necessary when you need to increase or decrease the total number of pixels, whereas remapping can occur when you are correcting for lens distortion or rotating an image. Zooming refers to increase the quantity of pixels, so that when you zoom an image, you will see more detail.Interpolation works by using known data to estimate values at unknown points. Image interpolation works in two directions, and tries to achieve a best approximation of a pixel's intensity based on the values at surrounding pixels. Common interpolation algorithms can be grouped into two categories: adaptive and non-adaptive. Adaptive methods change depending on what they are interpolating, whereas non-adaptive methods treat all pixels equally. Non-adaptive algorithms include: nearest neighbour, bilinear, bicubic, spline, sync, lanczos and others.

3. AN OVERVIEW OF PROPOSED SYSTEM

A wavelet is a type of sinusoidal signal with an oscillation like a wave of amplitude which rises from Zero to increasing level and again decreases back to zero. A Heart monitoring tool or seismograph is usually used to record the brief oscillations of a wavelet. These are generally used in signal processing due to their specific sort of properties embedded in them. In order to acquire information from the unknown portions of the damaged signal, these wavelets are combined with known portions of damaged signals using some techniques like multiple, shift, and integrate convolutions. Whenever an unknown signal contains frequency then mathematically a wavelet correlates with that signal. Many kinds of data can be extracted by using wavelets like signals, images and audio. In order to analyse the data fully set of wavelets whichare to be needed. A decomposition process of a wavelet is said to be reversible because the data decomposition of a wavelet is done with no overlaps and gaps. So whenever there is a need to recover the original signal with minimal loss in wavelet decompression and compression a set of complementary wavelets are used.

The user defined database that we have used is in the format of .AVI extension video file. The results will be obtained on this proposed framework only whenever the input video file is in .AVI extension. Figure (1-2) shows few sample image frames that we have used in our study.

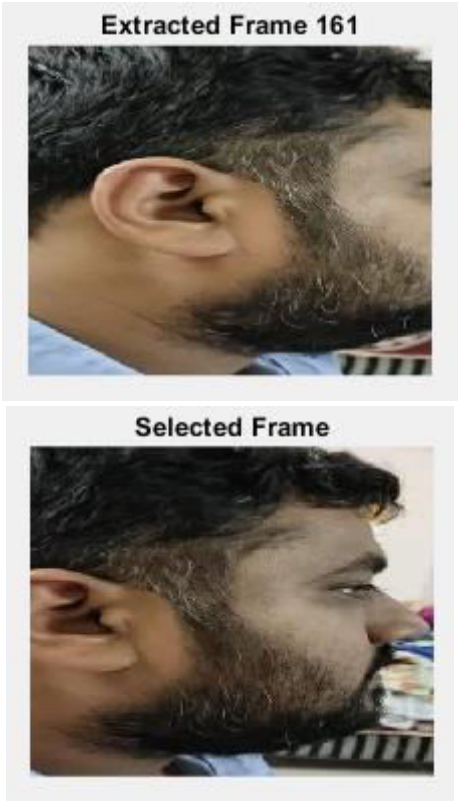

Fig.3.1. Selected images.

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The proposed framework of our biometric system has been gone with several experiments using our own user defined databases of video data sets. We involved different metrics in our proposed biometric system to measure its performance. The same experiment has taken to test our biometric system with multiple data sets of video files in .AVI extension.

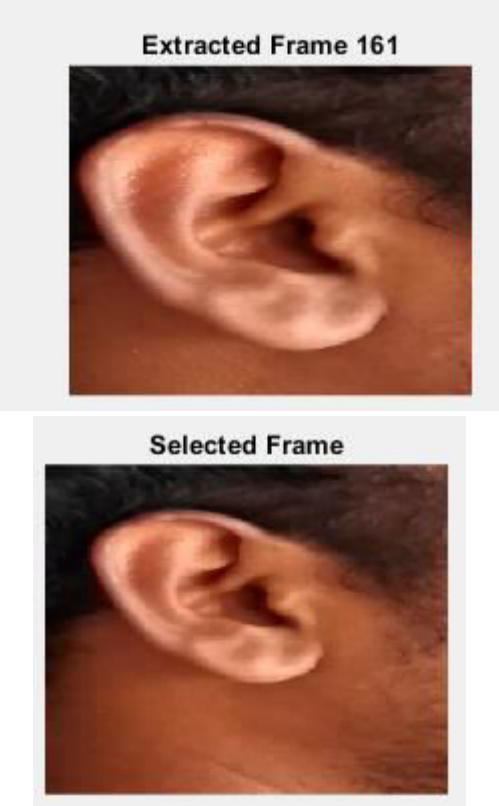

Fig.3.2. Represents the number of frames and selected from user defined.

A daubechies wavelet filter transform for feature grabbing without of any illusion effects, lightening effects as well as occlusions are carried out by some distance metrics. which is shown below with approximation and details parts like horizontal, vertical and diagonal of the image from low pass filter.

Fig.3.3. Application of daubechies wavelet transform to the image.

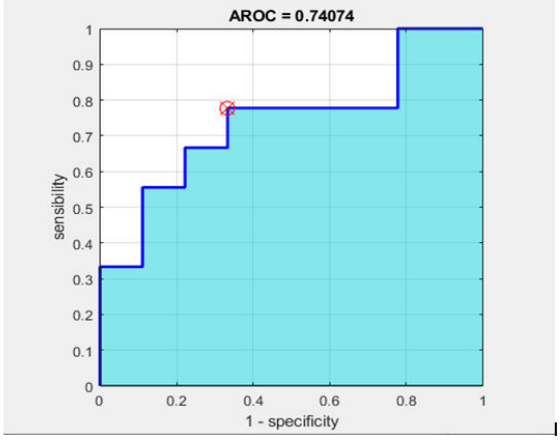

Fig.3.4. Receiver operating characteristics curve with specificity against sensibility.

4. CONCLUSION

In this paper a 2dimentional discrete wavelet transform has been used to extract the features from ear. It can be used to capture the texture details in 2D signal as well as for analyzing the multiresolution of 2 dimensional signals. A second level decomposition of dwt is carried out and then energy features has extracted from each decomposition levels. FAR, FRR, EER, accuracy is used to measure the performance of the image decomposition. There is a huge scope for ear biometrics in the current trend followed by a Deep learning and artificial neural networks with huge number of dataset for authorization in security aspects.

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