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Feature Extraction of Iris and Palmprint Biometric System using Dwt

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***Abstract*: Much work is done on Iris Recognition, since few years. Many cases discussed about performance in view of image capturing and recognition. Daugman work is the most important related to iris biometric in early research. It is fair to say, it is base model for iris biometric. Almost the available iris systems are based on this work.**

A palm print is image of the palm area of a hand. It is either an image taken online or offline. It is one of the most familiar and promising biometric model for personal identity verification. It is tough task to differentiate lines and wrinkles without explicit definition. depends on the thickness and position of some key points we can define principal lines. In our work, we are taken the principal line magnitude is less than or equal to 1. we cannot consider broken lines. If it is the case broken point is treat as last point.

Keywords : iris, bio metric ,lines, wrinkles, broken lines.

I. INTRODUCTION

In Recent years, many works are done on Iris Recognition System, Most of the cases, authors claimed the better performance of speed in capturing images and recognition over the existing systems available at that time.Flom &Safir got a patent for an automated iris biometrics system. But this concept is recommended for some special conditions, like a headrest, manual operation .to extract iris image descriptors, different methods are used some of them are pattern recognition tools, detection of edges using an algorithms, and Hough transform. they suggest a method to find connected points using a threshold value. this method finds individual iris can be saved on identity card for verification test.

In Doghman method a image of an human eye in digital form is acquires through camera .Systems based on Daugman concept requires position their eye with in the camera field view. Based on power level in upper and middle bands of 2D frequency spectrum . system can assess the focal of the image. The algorithm checks for maximize the spectral power .Wildes approach is very much different from that of Daugman. In Daugman's method image captured with an "LED-based point light source in conjunction with a standard video camera," where Wildes method uses "a diffuse source and polarization in conjunction with a low light level camera." For iris boundary localization , Daugman's method looks for the maximum integro-differential operator ,which responds to circular boundary. But Wildes method uses a binary edge map along with Hough transform.

II. AUTHENTICATION BLOCK DIAGRAM

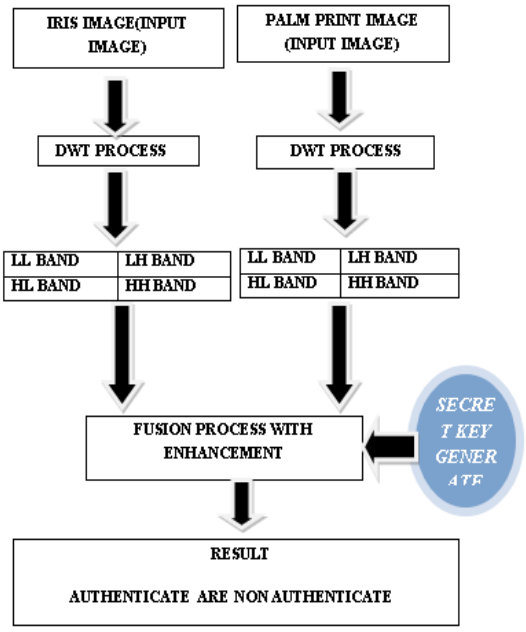

Fig1: Block diagram of a person authentication

The database consists 3 x 128 iris images which are 24 bit - RGB, 576 x 768 pixels in PNG file format.The iris image consists a biometric sign for verifying personal identity. Due to some special properties include difficulty in texture modification and internal protection, it is superior to other system for auto detection. Additionally it has advantages over fingerprints is easy to register iris without physical contact and feature extraction is also easy.The DWT is developed to apply the wavelet transform to the digital world. continuous wavelet transform can be approximated using Filter banks .The signal is decomposed into low frequency and high frequency using filters.

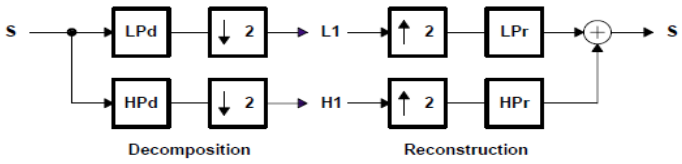

Fig2 : Discrete Wavelet Transform

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Filter banks decompose signal into various frequency components. Most of the information contains in low frequency level and details are represented using high frequency component. two channel filter bank can be used for decomposition. pyramid and wavelet packet type structures are used. the low frequency component can be decomposed by first method and second one decomposes the approximation and detail.

Algorithm:

i) acquire input image and pre process to detect the inner and outer boundary regions.

ii) Normalize the acquired iris image.

iii) Extract Energy features of palm using sequential Modified Haar Transform.

iv) Represent Haar Energy using feature vector and compare using Euclidean distance.

V)DWT Processed iris and palm images are fused for Authentication .

III. FEATURE EXTRACTION OF PALM PRINT

It is the process of extracting features for identity recognition. everyone has unique palm print it is universal and also easy to capture image using camera. it may not change with time. High accuracy biometric can be provided by iris but it is cost effective. Palm print system is user friendly because of presenting hand in front of camera. In Image Capturing, no pegs alignment is required and no special lighting condition but Dark background is considered. Segmentation may easily done by low intensity background. The Region of interest is find in preprocessing stage.

Fig3.Binary hand image

Global thresholding method is proposed by Otsu In 1979.An Image Composed with Target and background with different gray levels from 0 to L based on histogram threshold K is chosen to segment image. The Background level range is between 0 to K and target level is K to L. K denotes threshold which make the interclass variance σ_B value maximum in all possible values. Once segmentation is completed, the boundary pixels are find with boundary tracking Algorithm.

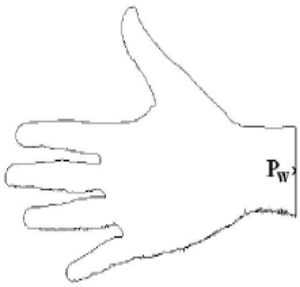

Fig4:Boundary Pixel of Palm

The Palm image angle of rotation is calculated. Consider a Line K between K1 and K2. Line K is in parallel with the x-axis for all the input hand images. KI and K2 distance is find using.

$$Dist_k = \sqrt{\Sigma(K_2 - K_1)^2}$$

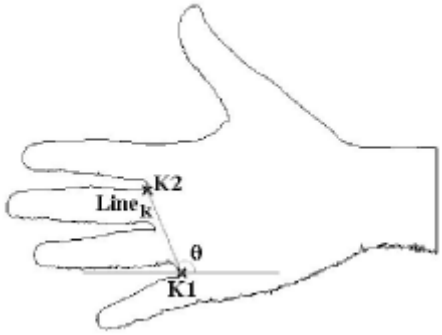

Fig5:rotation angle representation

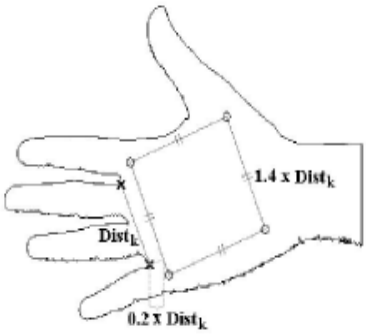

Fig 6:Calculation of Distance between Line k and Square ROI

By Cropping the hand image according to its min and max of x and y coordinates of square region of interest . The diagonal pixels are determined by rotating 0 degrees clockwise. Fig 7 shows the palm print image in grey scale intensity format.

Fig 7:(a)Palm print Image

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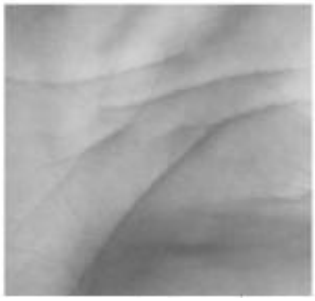
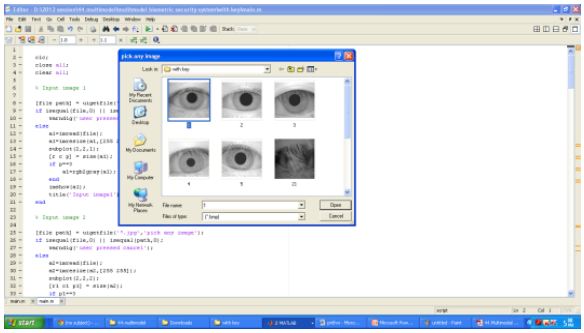


Fig 7: (b)Palm print Image in Gray scale Intensity Format.

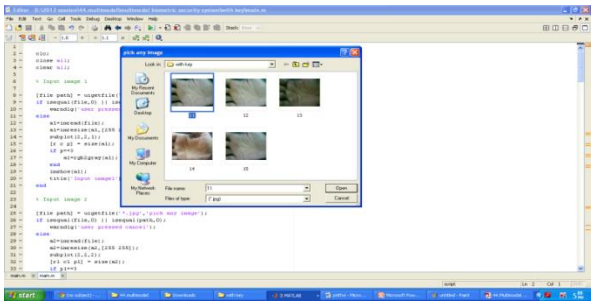
IV. IMAGE FUSION AND KEY GENERATION

The process of combining more than one image which are relevant information is known as image fusion. It gives more informative single image of multiple input images. Sometimes image processing demands the situations where more spatial and spectral resolution in one image. For example in satellite imaging, the transmitting image is panchromatic image with high resolution. At the receiver, panchromatic image and multispectral data are merged to transmit more information. the feature vector is find using different combinations of LH3, HL3, and HH3 with candidate sub-images. The results are compared to find the best. Key generation is used for cryptography. Data can be encrypted and decrypted using key. A Single common shared key is used in Symmetric-key method, we can maintain secrecy by keeping this key secret.

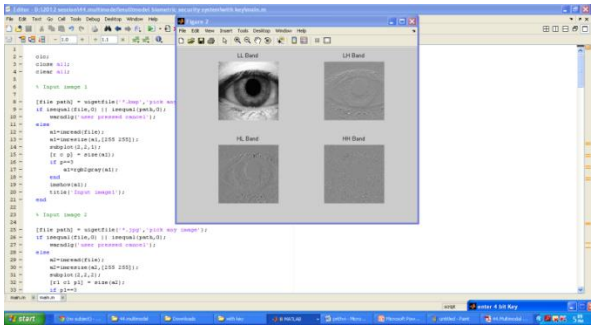
V.RESULT AND DISCUSSION



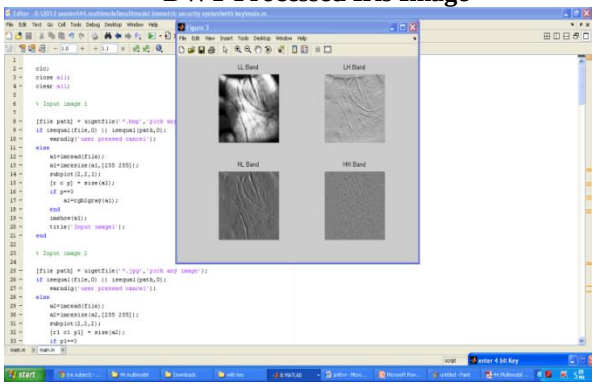
Iris Image selection



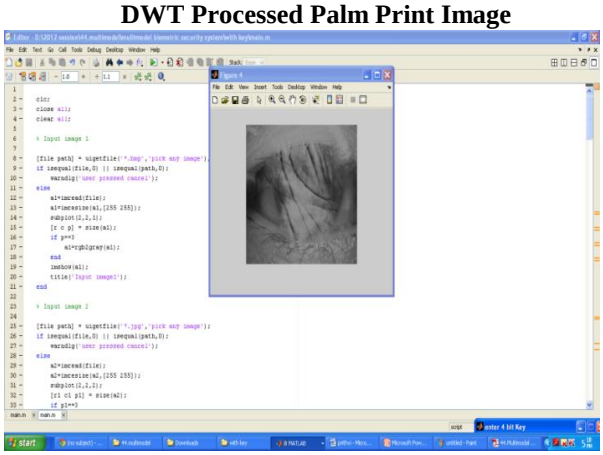
Palm print Image selection



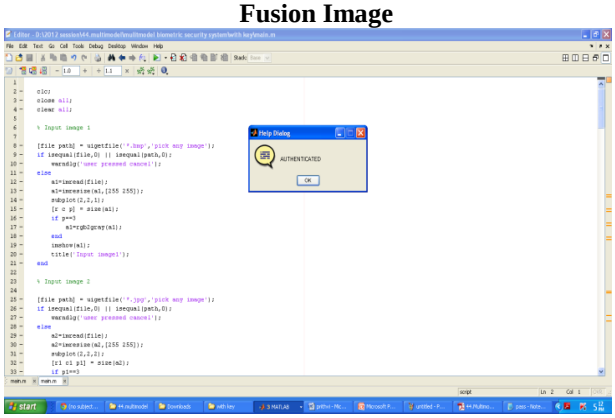
DWT Processed Iris Image



DWT Processed Palm Print Image



Fusion Image



Authentication Process

Different input images taken from database, and relative code matrices are found. concatenate the input images and shift the feature vectors for image fusion. If the new input either iris or palm image is given, correspondingly image code matrices are calculated and perform pattern matching . Based on resultant value we can define class to which new image belongs to and also we can find acceptance or rejection ratio using wavelets.

VI. CONCLUSION

Different input samples of iris and palm images from 20 persons are taken and code matrices are generated .using the pattern matching method the false acceptance or rejection ratio is calculated. Based on the this value the Authentication process takes place .By Applying Appropriate wavelets we can improve the speed in Authentication process.We can improve the performance of the system by using Efficient pattern matching methods.

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