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AUTHENTICATION AND SECURITY BIOMETRICS BASED ON FACE RECOGNITION.

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Abstract **:** *Nowadays security becomes a most important issue regarding a spoof attack. So, multimodal biometrics technology has attracted substantial interest for its highest user acceptance, high security, high accuracy, low spoof attack and high recognition performance in biometric recognition system. This multimodal biometrics system introduces recognition of person from two things i.e. face & palm print. Principal Component Analysis (PCA) algorithm is used for reduction of dimension & extraction of features in terms of eigenvalues & eigenvectors. Feature level fusion technique used to fuse the results of face & palm prints and then gives the output as per neural network classifier which gives the correct information about genuine or imposter identity. Automatic person identification is an important task in computer vision and related applications. Multimodal biometrics involves more than two modalities. The proposed work is an implementation of person identification fusing face, palm biometric modalities used PCA based neural network classifier for feature extraction from the face and palm images and hamming distance for calculating iris templates. These features fused and used for identification. Better result was obtained if the modalities were combined. Identification was made using Eigen faces, Eigen ears, Template of iris and their features tested over the self created image database.*

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Keywords- multimodal biometrics system, face & palm print, Principal Component Analysis (PCA).

I. INTRODUCTION

Biometrics is the process of identifying of an individual in terms of their physiological and behavioral characteristics. Face, hand, eye, ear, skin, odor, dental and DNA are the general physiological characteristics which we have used. Voice, gait, keystroke, signature, mouse movement and pulse are the general behavioral characteristics which we have used; two or more biometrics can be merged to enhance the accuracy of recognition. Moreover, for identification some soft biometric traits such as gender, age, height, weight, ethnicity and eye color can also be used. Usually through the live measurements of the characteristics of the human body, the biometric system is developed to solve the matching problem. It works in two stages. First a person should record his/her biometric in a system where the biometric templates are stored. Second the person should provide the same biometric for new measurements. The result of the new measurements will be processed using the same algorithm which is used at the time of registration and then contrasted to the stored template. If the similarity is larger than the system defined threshold, the verification is successful otherwise it would be unsuccessful

Face is one of the most popular biometric characteristics, due to the fact that it is the easiest biometric characteristic to acquire non-intrusively, in various modalities. The drawback of biometric systems based on face is that, compared to other biometric characteristics, due to many variations in face appearance, accuracy achieved using face as a biometric characteristic is generally low. Variations in face appearance are the effect of multiple factors such as face position, expression and aging. In addition, human hand contains a variety of features that can be used in biometrics and is considered to be one of the most acceptable biometric characteristics. The drawback of biometric systems based on hand is the requirement of most systems for the user to place a hand on the sensor for identification or verification. The palm is the inner surface of the hand between the wrist and fingers,. Early works in automatic palm print recognition utilized palm print images obtained off-line .while the newer systems typically obtain palm print image by using a scanner or a CCD camera.

II. METHEDOLOGY

2.1Experimental Specification

A) Palm print and facial feature extraction are becoming one of the major issues in finding the identity of a person. Quite a lot of techniques have been available for the extraction of face and palm print. In this paper, we have developed an efficient technique for the extraction of face and palm print.

In figure flow diagram of system is shown. First of all face and palm input is taken. Then it is transformed by gabor transform and wavelet transform. Then PCA algorithms are applied. Then feature level extraction is done. Then fusion of face and palm input is carried out. In last result is taken and it is compared with database. After comparison result is taken

whether person is authorized or not. FAR is false acceptance ration when wrong person is given access to the system. So FAR is system error and that should be minimized.

PCA Algorithm

B) Principal component analysis (PCA) is a statistical procedure that uses an orthogonal transformation to convert a set of observations of possibly correlated variables into a set of values of linearly uncorrelated variables called principal components. The number of principal components is less than or equal to the number of original variables. This transformation is defined in such a way that the first principal component has the largest possible variance (that is, accounts for as much of the variability in the data as possible), and each succeeding component in turn has the highest variance possible under the constraint that it is orthogonal to the preceding components. The resulting vectors are an uncorrelated orthogonal basis set. The principal components are orthogonal because they are the eigenvectors of the covariance matrix, which is symmetric. PCA is sensitive to the relative scaling of the original variables.

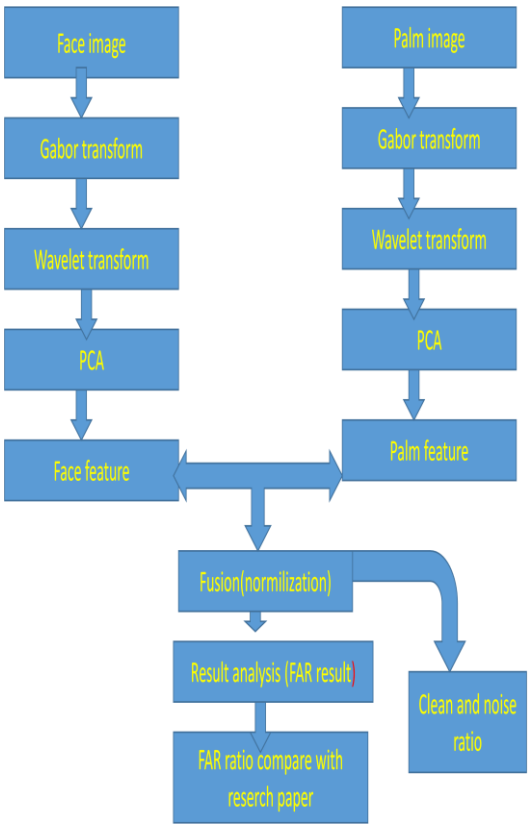

Figure 1 Flow Diagram for System

III. RESULT

We simulated different stages of iris recognition discussed above in MATLAB 7.10.0. results obtained from different stages are as follows:

There are various steps in palm print extraction are as follows:

(i) Initializing the input

Initially, the input palm print image is taken for which the feature extraction has to be done.

(ii) Applying RGB to Gray scale component

Palm print images cannot be given directly as the input for the proposed technique. Here, input palm print images are firstly converted into RGB colour space in order to get the extracted features. It converts RGB images to gray scale by eliminating the hue and saturation information while retaining the luminance.

(iii) Canny Edge detection method

Subsequently, the edge detection method i.e. canny edge detection method is applied which extracts the edges. The probability of detecting real edge points should be maximized while the probability of falsely detecting non-edge points should be minimized. The detected edges should be as close as possible to the real edges.

(iv) Region Cropping

Consequently, the region Crops method is applied on the edge extracted image. The main function of region props is measured the properties of image regions and this region props method calculates the centroid of each region with the decimal places.

(v) Setting the threshold

The threshold value is set as 50.Therefore the line having pixels area greater than 50 are extracted from the image. The line having the pixels area which is less than 50 are eliminated in the cropped image.

(vi) Analyzing the x and y coordinates

Finally, x and y coordinates are determined for the image segment. Then the length of the x and y coordinates gives the feature extracted palm print image

Face Recognition

Fig 2: Scanned input image

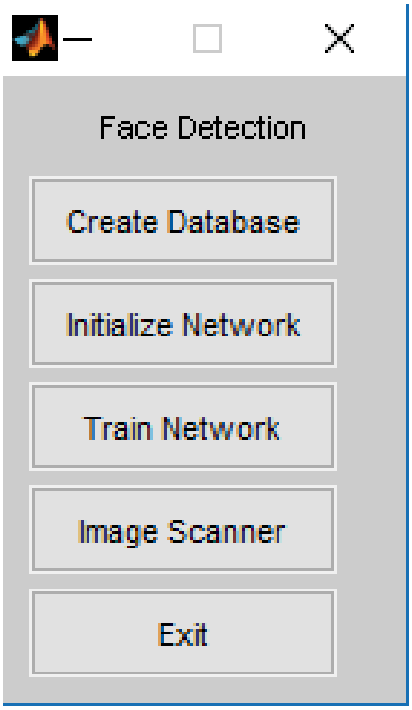

Fig 3: GUI Result

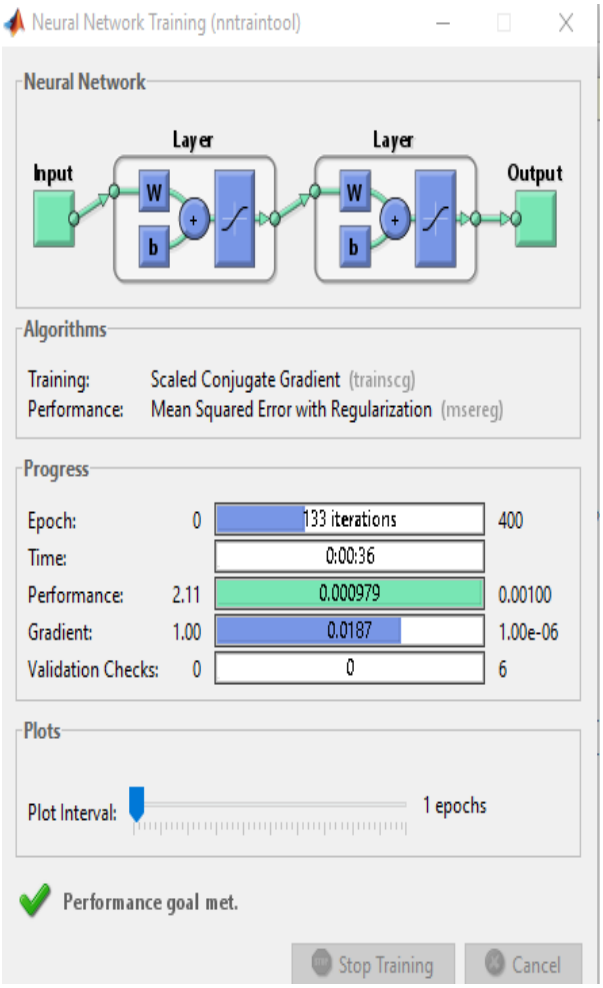

Fig 4: Neural Network Training Tool

Fig 5 : Region Cropping output

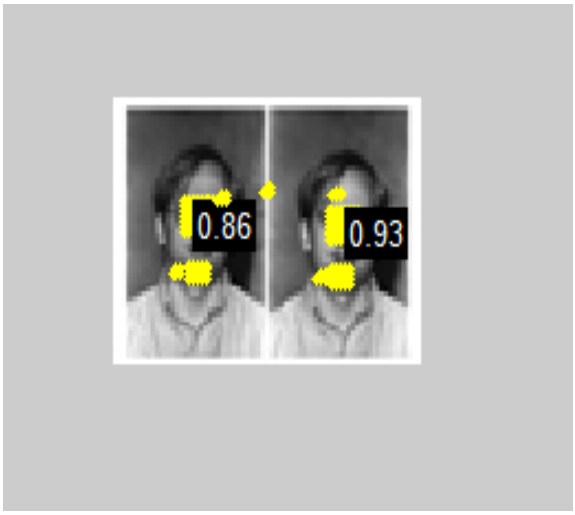

Fig 6 : Final output

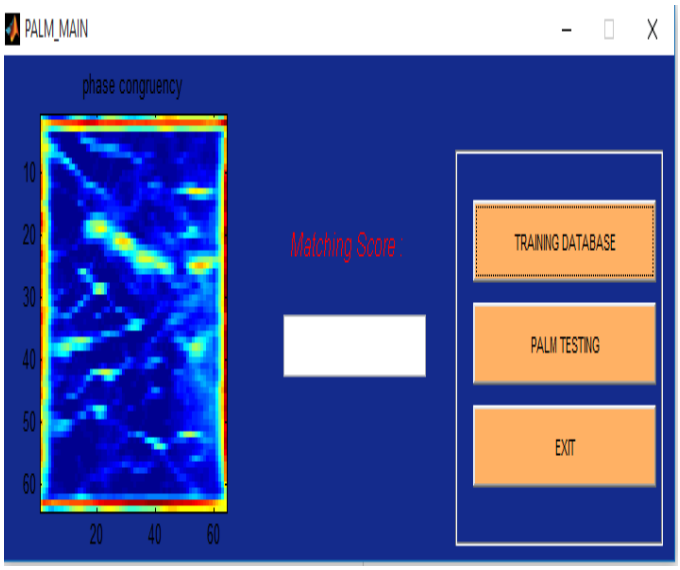

Fig 7 :GUI for palm print recognition

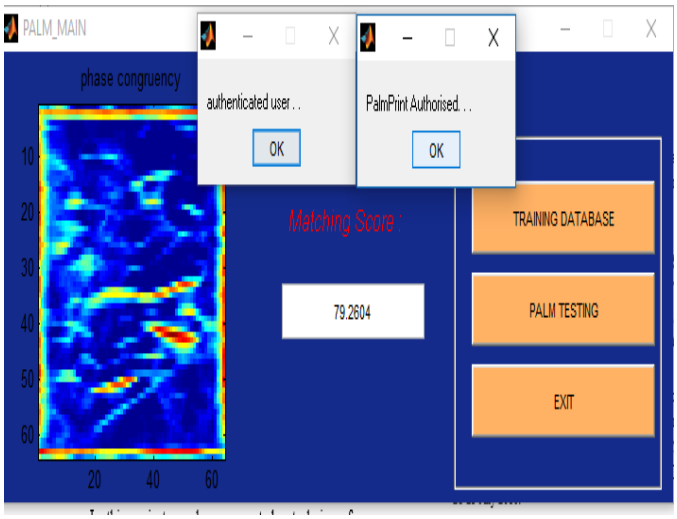

Fig 8 Authenticated person recognized using system

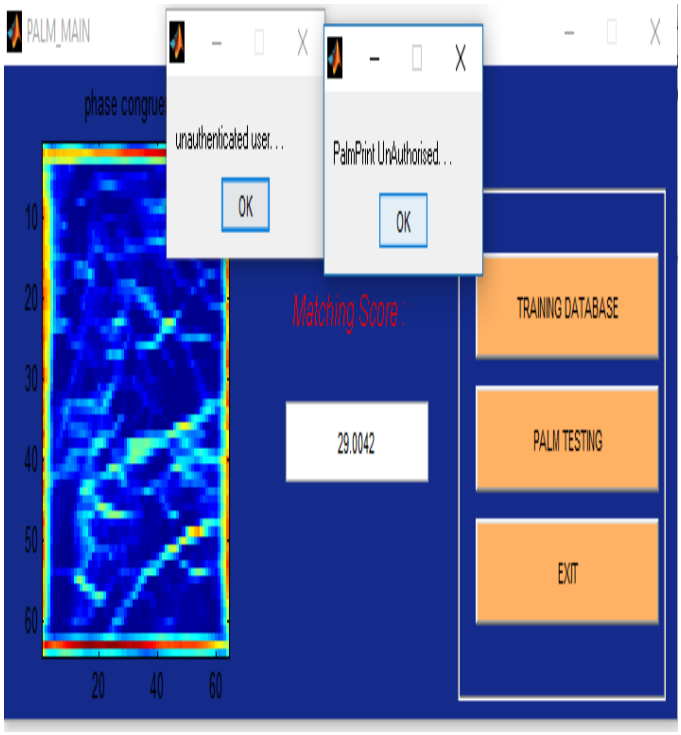

Fig 9 Authenticated person recognized using system

IV. CONCLUSION

In this project, we have presented a technique for multi-modal biometric recognition using feature level fusion. Initially we take data sets namely face and palm print. Using multi-text on histogram we extract the features from the face and the palm print features are extracted directly. We concatenate the face and palm print using XOR, AND and OR gate with the help of Particle Swarm Optimization algorithm. In recognition, the concatenated feature is matched through distance matching and distance score is provides recognition identity of a person. The proposed technique is obtained with the help of evaluated with the performance metrics such as false acceptance rate, false rejection rate and accuracy. Finally, the comparative analysis shows the proposed fusion technique provides 92% accuracy for both the equation such as (A-B)+A, 2*(A+B) .This provide better results when compared to the existing technique

V. REFERENCES

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