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Multi Feature Palm Print Recognition Using Smart Fusion Technique

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ABSTRACT

This paper provides security using biometric system which is considered as an important issue. Using single palm in biometric system is said to be a single biometric which is emerging as an exciting new paradigm, but has been less used because of its less resolution and efficiency. In this paper, we developed novel framework to perform multi biometrics by comprehensively combining left and right palm-print images. Since multi biometrics can provide higher identification accuracy than single biometrics, it is more suitable for some real-world personal identification applications that need high standard security. Among various biometric technologies palm-print identification had received attention because of its good performance. Combining left and right palm print images to perform multi feature biometrics is easy to implement and can obtain better results. This framework integrates three kinds of scores generated from left and right palm print images to perform matching score-level fusion. The first two kinds of scores were respectively generated from left and right palm print images and can be obtained by any palm print identification method, whereas third kind of score was obtained using a specialized algorithm proposed in this paper.

Keywords: Palm Print Recognition, ,Smart Fusion Technique, Biometric, 2D, 2DLDA, 2DLPP

I. INTRODUCTION

Personal identification technology is increasingly becoming important in security system. The key advantages of using biometric technology are non-repudiation, not guessable, not forgettable and availability. There are many traits used as biometric identifiers to authenticate individuals. One of the trait in biometric system are palm print which holds good resolution accuracy.

Palm print identification technology is an important personal identification technology and it has attracted much attention. The palm print contains not only principle curves and wrinkles but also rich texture and miniscule points, so the palm print identification is able to achieve a high accuracy because of available rich information in palm print.

Palm print authentication is a type of vascular pattern authentication which is used for security. It works by comparing the pattern of prints in the palm of the person being authenticated with the pattern stored in a database.It gives final matching score to the user for the betterment of authentication. Each individual twins have distinct patterns which contribute to the high accuracy rates of palm print technology. Thus forgery is extremely difficult under ordinary conditions which make this method of biometric authentication more secure than others.

II. METHODS AND MATERIAL

1. RELATED WORK

For the implementation process, we had reference
With below related ideas.

A. EXISTING SYSTEM

In existing system, various palm print identification methods such as code based method and principal curve method have been proposed. Now a days, 2D appearance based methods such as 2D principal component analysis (2DPCA), 2D linear discriminant analysis (2DLDA) and 2D locality preserving

projections (2DLPP), initially proposed is an exciting new paradigm. Under this paradigm the limitation of an existing system is unimodal biometric technique which have less performance and more processing time. No single biometrics technique can meet all requirements in circumstances. It is a challenging problem of increasing performance in less time using multi biometrics.

2. EXPERIMENTAL WORK

A. PROPOSED SYSTEM

In a proposed system, we introduce a concept of combining the left with right palm print at matching score level. Fig 1 shows the procedure of proposed framework. In the framework, three types of matching scores which are respectively obtained by left palm print matching and right palm print matching and crossing matching between the left query and right training palm print are fused to make the final decision.

The framework not only combines the left and right palm print images for identification but also properly exploits the similarly between the left and right palm print of same subject. Extensive experiments show that the proposed framework can integrate most conventional palm print identification methods for performing identification and can achieve higher accuracy than conventional methods.

This below work has the following notable contributions illustrated in figure 3.1

First, it for the first time shows that the left and right palm print of the same subject are somewhat correlated, and it demonstrates the feasibility of exploiting the crossing matching score of the left and right palm print for improving the accuracy of identity identification.

Second, it proposes an elaborated framework to integrate the left palm print, right palm print and crossing matching of the left and right palm print for identity identification.

Third, it conducts extensive experiments on both touch-based and contactless palm print databases to verify the proposed framework.

B. ALGORITHM

1. NSCT Algorithm

In a multimodal biometric system, fusion can be done at feature level, machine score level or decision level. Matching score level fusion is commonly preferred because matching scores are easily available and contain sufficient information to distinguish between a genuine and an impostar case. So, combining information contained in the matching scores seems both feasible and practical. In the paper, we have used the score-level fusion for palm print recognition for multi-spectral palm print images to combine the scores produced individually for multispectral palm print images under Red, Blue, and Green.

Two types of fusion schemes called SUM and MAX operators are used to deal with those scores. Considering SR, SB, SG and SN as the scores produced for R, B, G and NIR images respectively, they have been combined in the first way to obtain the final score SF is,

$S_f = \text{SUM}(S_R, S_B, S_G, S_N)$
$S_f = \text{MAX}(S_R, S_B, S_G, S_N)$

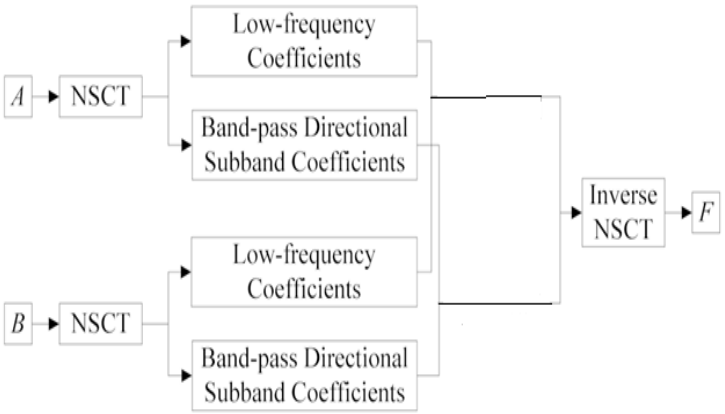

Figure 1

C. SYSTEM DESIGN

The system captures the image of both left and right palm. It validates that user authenticated image is correct

with the previously stored image in a database. It also gives matching score for the betterment of authentication. The matching score is done on both left and right palm. Final matching score is given by the system to the user which is shown in fig 3.2

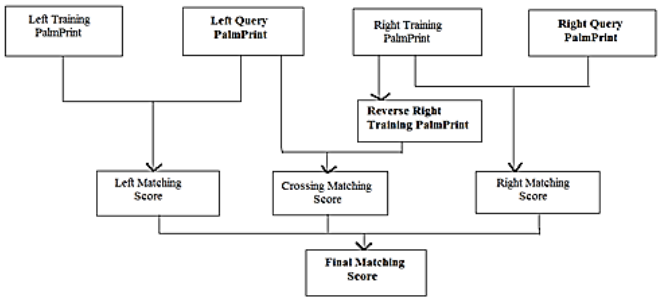

Figure 2

D. PHASES

1. Image acquisition.
2. Pre-processing.
3. Segmentation.
4. Post processing.
5. Features extraction.
6. Matching.

1. Image Acquisition

The first process of any image verifying system is the image acquisition stage.

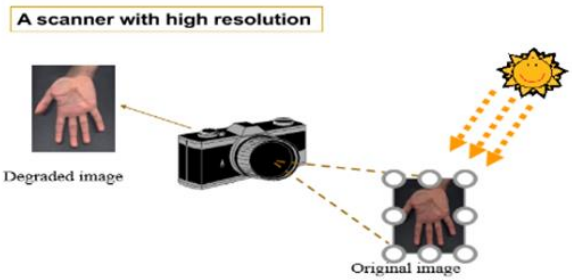

Figure 3. Image Acquisition

After the scene has been obtained, various methods of processing are applied which is shown in fig 3.

However, if the image required has not been acquired satisfactorily then the intended tasks may not be achievable.

2. Pre-processing

The image pre-processing starts with image enhancement. The aim of image enhancement is to improve interpretability or perception of information and to provide better input for other automated image processing techniques.

In the image enhancement stage we use following three techniques:

- Median filter.
- Sharpening filter.
- Contrast limited with adaptive histogram equalization.

3. Segmentation

Convert the palm print image to a binary image. Gaussian smoothing is technique used to enhance the image. To obtain the boundaries of the gaps between fingers, boundary-tracking algorithm is applied which is shown in fig 3.4. Finally, extract ROI for feature extraction which is the central part of the palm print.

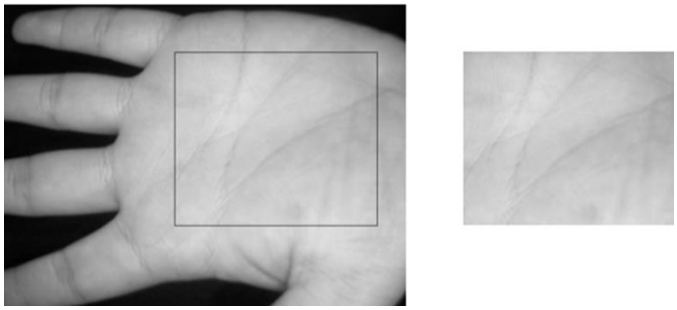

Figure 4. ROI Extraction

4. Post Processing

In post processing, edge detection is done. Edge detection is the process of identifying and location sharp discontinuities in an image. Edge detection method can be predicted by the sobel gradient operators.

5. Feature Extraction

To extract the features of palm print, eign palm based approach is used. Eign vectors of the covariance matrix palm print like in appearance are referred as “eign palms”.

6. Matching

Finally pairing is used. For fusing information from different image; to detect changes in a scene; to mosaic overlapping images of a scene that forms a large image and to recognize an object by registering its image, it is done.

III. CONCLUSION

In this paper we propose a process of capturing the both left and right palm, they are not scanned. Using the high quality pixels, images that are captured obtains better result. The principal lines are first considered as an input. Then the density map and orientation field are taken for better authentication which gives better result. All individuals do not have same patters or lines, it differs.

IV. FUTURE ENHANCEMENT

In this paper, we present a single level authentication to the user which may be insecure in future times. Allp patterns, lines, wrinkles etc., are captured, analyzed, compared and checks matching using previous stored image in database. So there is no possible in doing forgery. If it is feels as insecure, two-level authentication can be used.

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