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Elaborated Framework to Integrate the Left and Right Palmprint for Improving the Accuracy of Identity Identification

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ABSTRACT: Palm print identification is an important personal identification and authentication method. Palm is explained as the inner surface of hand from the wrist to the root of the figures. In this paper we develop the accurate personal identification by combining the left and right palm print images. Palm printing has gained the attention over several years from recent researches in multibiometrics. As the security system has very much important in several fields, it is very important to authenticate the users for any access. As many studies have been proposed but these researches did not explore the security issue in depth, so in this paper we established a framework in order to perform multibiometrics by combining left and right palm print images. The framework which we implemented here requires pre-processing to remove the noisy portions and to enhance the image, Gaussian filter for enhancing the image. In this, the image is subjected to binarization with an average threshold value. The ROI portion was extracted based on bounding box calculation. After extracting the ROI part, the image was in gray scale form. The gray scale image was converted into binary image. This process of conversion is known as binarization. We used canny edge detection technique for detecting the edges of the image. Morphological operation is used for expanding and reducing the shape of the image. Here we used morphological Opening, which remove the unwanted pixels (small objects) which are present in the image. Gabor filter is used for palm image feature extraction. The extracted features of the left and the right palm image are combined and stored in the feature database. This process was repeated for all the images present in the input database. After this training process gets over, we choose a single testing image each from right and left palm print folder respectively. If it was matched with the database, it results as genuine and if it was not matched, it results as fake. Thus recognition was achieved.

KEYWORDS: Palm printing, Gabor filter, Canny edge detection, Normalization and ROI extraction.

I. INTRODUCTION

Important personal identification technique is palm print identification. It the palm print identification has capacity to achieve a high accuracy, since technique contains not only principle curves, wrinkles, rich texture and minuscule points, and also due to availability of rich information in palm print. Various palm print identification methods, such as coding based methods and principle curve method have been proposed in past years. Along with those methods one more method called subspace based methods in this method also Palm is defined as the inner surface of human hand from human wrist to the root of their fingers. Many other techniques are deployed for palm printing in that Representation Based Classification (RBC) method also shows good performance in this regard and also Scale Invariant Feature Transform (SIFT) which transforms image data into scale-invariant coordinates, are successfully introduced for the contactless palm print identification. A print is an impression made in or on a surface by pressure. A palm print is defined as the skin pattern of a palm, composed of the physical characteristics of skin pattern such as lines, points and texture. Palm print is rich in principal lines, wrinkles, ridges, singular points and minutiae points. Palm

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print has a much larger area than finger tip. As the security system has very much important in several fields, it is very important to authenticate the users for any access. As many studies have been proposed but these researches did not explore the security issue in depth, so in this paper we established a framework in order to perform multibiometrics by combining left and right palm print images. The authentication system consists of enrolment and verification stages. In enrolment stage, will consider the training samples and processed by pre-processing, feature extraction and modeling modules to produce the matching templates. Where as in verification, a query sample is also processed by preprocessing and feature extraction method and then is matched with reference templates to decide whether it is sample which we considered or not. A setup system consisting of a palm print based authentication system can work with multipurpose camera in an uncontrolled circumstances like mounted on a laptop, mobile device. Unlike earlier biometric systems, it does not require equipment and have attained higher accuracy value equivalent to fingerprint. We used SIFT and OLOF method, is an algorithm in palm print recognition to detect and describe local features in images. Old multibiometrics methods treat different pattern independently. However, some special kinds of biometric traits have a similarity and these methods cannot exploit the similarity of different kinds of pattern. For example, the left and right palm print traits of the same subject can be viewed as this kind of special biometric traits owing to the similarity between them, which will be demonstrated later. However, there is almost no any attempt to explore the correlation between the left and right palm print and there is no “special” fusion method for this kind of biometric identification. This specialized algorithm carefully takes the nature of the left and right palm print images into consideration, it can properly examine the similarities between the left and right palm prints of the same object/human. The framework which we implemented here will integrate three kinds of scores; these scores are generated from the left and right palm print images to do matching score level fusion. First two kind of scores can be obtained from any other conventional methods easily but the third kind of score has to obtain using specialized algorithm, which takes the nature of the left and right palm print images into consideration, it can properly exploit the similarity of the left and right palm prints of the same subject. Moreover, the proposed weighted fusion scheme allowed perfect identification performance to be obtained in comparison with previous palm print identification methods. . Moreover, the proposed specialized fusion scheme allowed perfect identification performance to be obtained in comparison with old conventional palm print identification methods

II. RELATED WORK

A. W. K. Kong, D. Zhang, and M. S. Kamel
Palmprint recognition has been investigated over 10 years. During this period, many different problems related to palmprint recognition have been addressed. This paper provides an overview of current palmprint research, describing in particular capture devices, preprocessing, verification algorithms, palmprint-related fusion, algorithms especially designed for real-time palmprint identification in large databases and measures for protecting palmprint systems and users’ privacy. Finally, some suggestion is offered.
D. Zhang, W. Zuo, and F. Yue

Palmprint images contain rich unique features for reliable human identification, which makes it a very competitive topic in biometric research. A great many different low resolution palmprint recognition algorithms have been developed, which can be roughly grouped into three categories: holistic-based, feature-based, and hybrid methods. The purpose of this article is to provide an updated survey of palmprint recognition methods, and present a comparative study to evaluate the performance of the state-of-the-art palmprint recognition methods. Using the Hong Kong Polytechnic University (HKPU) palmprint database (version 2), we compare the recognition performance of a number of holistic-based (Fisherpalms and DCT+LDA) and local feature-based (competitive code, ordinal code, robust line orientation code, derivative of Gaussian code, and wide line detector) methods, and then investigate the error correlation and score-level fusion performance of different algorithms. After discussing the achievements and limitations of current palmprint recognition algorithms, we conclude with providing several potential research directions for the future.

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D. Zhang, F. Song, Y. Xu, and Z. Lang
With the increasing concerns on security breaches and transaction fraud, highly reliable and convenient personal verification and identification technologies are more and more requisite in our social activities and national services. Biometrics, used to recognize the identity of an individual, are gaining ever-growing popularity in an extensive array of governmental, military, forensic, and commercial security applications.
Advanced Biometric Recognition Technologies: Discriminant Criterion and Fusion Applications focuses on two kinds of advanced biometric recognition technologies, biometric data discrimination and multi-biometrics, while systematically introducing recent research in developing effective biometric recognition technologies. Organized into three main sections, this cutting-edge book explores advanced biometric data discrimination technologies, describes tensor-based biometric data discrimination technologies, and develops the fundamental conception and categories of multi-biometrics technologies.

R. Chu, S. Liao, Y. Han, Z. Sun, S. Z. Li, and T. Tan
In this paper, we present a face and palmprint multimodal biometric identification method and system to improve the identification performance. Effective classifiers based on ordinal features are constructed for faces and palmprints, respectively. Then, the matching scores from the two classifiers are combined using several fusion strategies. Experimental results on a middle-scale data set have demonstrated the effectiveness of the proposed system.

A.-W. K. Kong and D. Zhang
There is increasing interest in the development of reliable, rapid and non-intrusive security control systems. Among the many approaches, biometrics such as palmprints provide highly effective automatic mechanisms for use in personal identification. This paper presents a new method for extracting features from palmprints using the competitive coding scheme and angular matching. The competitive coding scheme uses multiple 2-D Gabor filters to extract orientation information from palm lines. This information is then stored in a feature vector called the competitive code. The angular matching with an effective implementation is then defined for comparing the proposed codes, which can make over 9,000 comparisons within 1s. In our testing database of 7,752 palmprint samples from 386 palms, we can achieve a high genuine acceptance rate of 98.4% and a low false acceptance rate of 3×10^{-6}%. The execution time for the whole process of verification, including preprocessing, feature extraction and final matching, is 1s.

III. EXISTING SYSTEM

PALMPRINT identification is an important personal identification technology and it has attracted much attention. The palmprint contains not only principle curves and wrinkles but also rich texture and miniscule points, so the palmprint identification is able to achieve a high accuracy because of available rich information in palmprint .
Various palmprint identification methods, such as coding based methods and principle curve methods have been proposed in past decades. In recent years, 2D appearance based methods such as 2D Principal Component Analysis (2DPCA) , 2D Linear Discriminant Analysis (2DLDA) , and 2D Locality Preserving Projection (2DLPP) have also been used for palmprint recognition.

DISADVANTAGES OF EXISTING SYSTEM

- No single biometric technique can meet all requirements in circumstances .
- The limitation of the existing system is unimodal biometric technique and have less performance.
- Processing time is high.

IV. PROPOSED SYSTEM

In this paper, we propose a novel framework of combining the left with right palmprint at the matching score level. Fig. 1 shows the procedure of the proposed framework. In the framework, three types of matching scores, which are respectively obtained by the left palmprint matching, right palmprint matching and crossing matching between the left query and right training palmprint, are fused to make the final decision.

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The framework not only combines the left and right palmprint images for identification, but also properly exploits the similarity between the left and right palmprint of the same subject. Extensive experiments show that the proposed framework can integrate most conventional palmprint identification methods for per-forming identification and can achieve higher accuracy than conventional methods.

This work has the following notable contributions.:
First, it for the first time shows that the left and right palmprint of the same subject are somewhat correlated, and it demonstrates the feasibility of exploiting the crossing matching score of the left and right palmprint for improving the accuracy of identity identification.
Second, it proposes an elaborated framework to integrate the left palmprint, right palmprint, and crossing matching of the left and right palmprint for identity identification. Third, it conducts extensive experiments on both touch-based and contactless palmprint databases to verify the proposed framework.

V. SYSTEM ARCHITECTURE

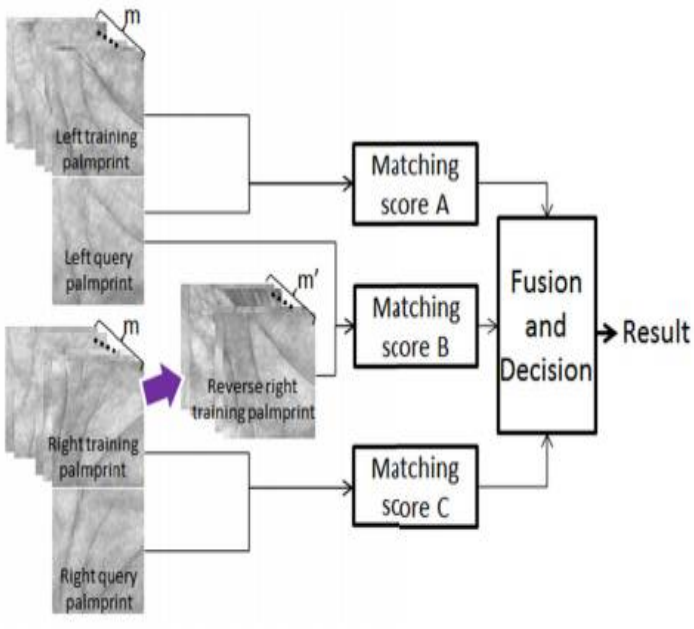

Fig 1: Fusion at the matching score level of the proposed framework.

VI. ADVANTAGES

The left and right palmprint images of the same subject are somewhat similar. The use of this kind of similarity for the performance improvement of palm-print identification. Very high accuracy.

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VII. SIMULATION RESULTS

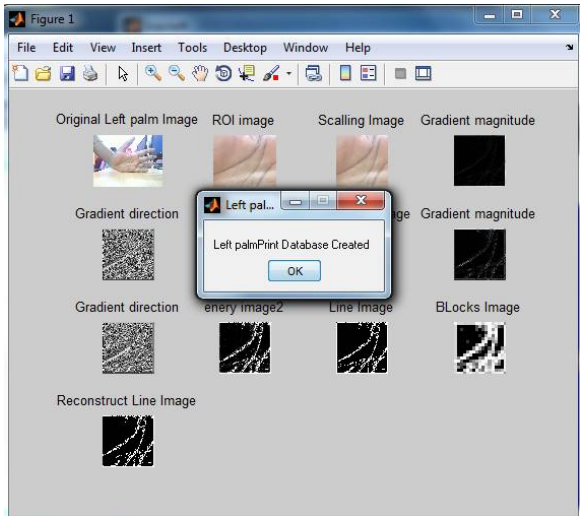

Fig 2: Left Palmprint added in database

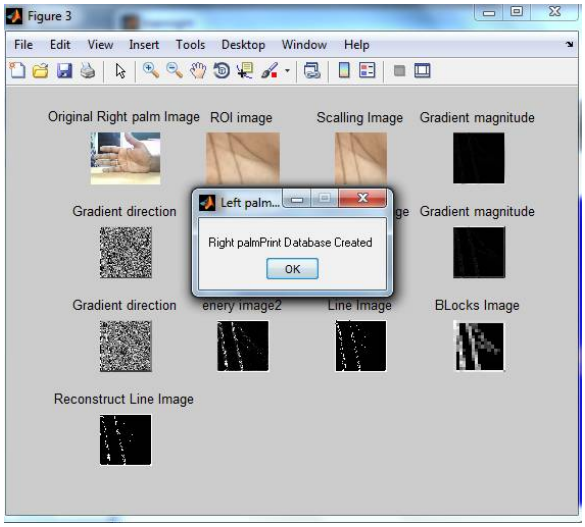

Fig 3: Right Palmprint added in database

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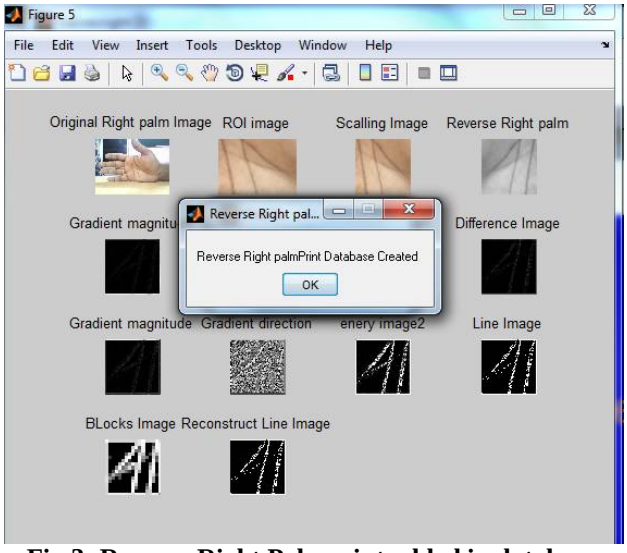

Fig 3: Reverse Right Palmprint added in database

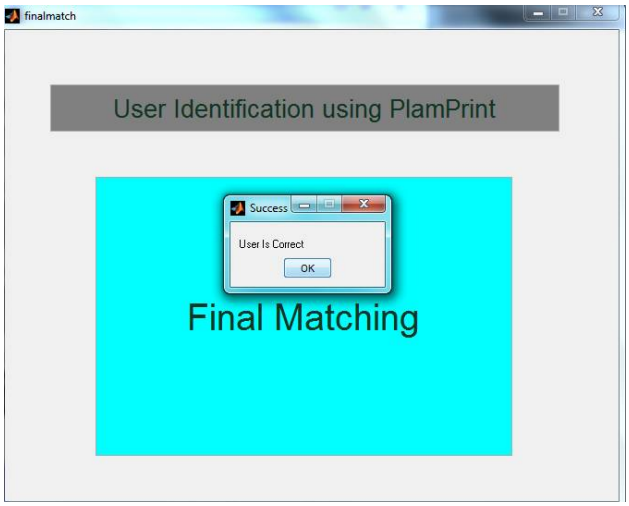

Fig 4: Final matching

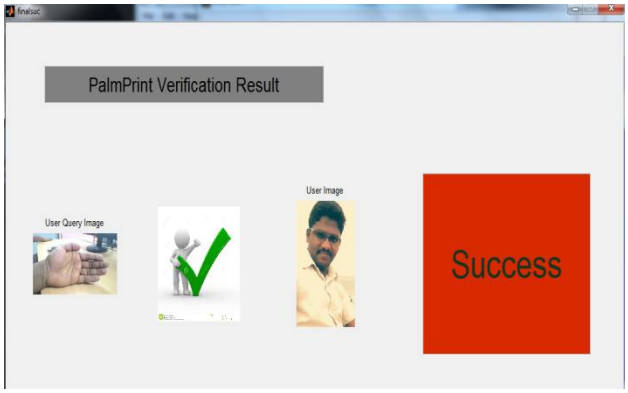

Fig 5: Palm print Verification Result

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VIII. CONCLUSION

In this paper we demonstrated that the left and right palm print images of the same subject are almost similar. For the performance improvement of palm print identification by using the similar patterns has been proposed in this paper. The proposed method carefully takes the nature of the left and right palm print images into account, and designs an algorithm to evaluate the similarity between them as we used canny edge detection and Gabor feature extraction techniques. Since, by utilizing this similarity, the proposed weighted fusion scheme uses a method to integrate the three kinds of scores generated from the left and right palm print images. Effective experimental results shows that the proposed framework obtains very high accuracy as we used many pre-processing techniques and the use of the similarity score between the left and right palm print leads to important improvement in the accuracy. This work also seems to be helpful in motivating people to explore potential relation between the traits of other bimodal biometrics issues.

REFERENCES

[1] A. W. K. Kong, D. Zhang, and M. S. Kamel, "A survey of palmprint recognition,"Pattern Recognit., vol. 42, no. 7, pp. 1408–1418, Jul. 2009.
[2] D. Zhang, W. Zuo, and F. Yue, "A comparative study of palmprint recognition algorithms," ACM Comput. Surv., vol. 44, no. 1, pp. 1–37, Jan. 2012.
[3] D. Zhang, F. Song, Y. Xu, and Z. Lang, "Advanced pattern recognition technologies with applications to biometrics," Med. Inf. Sci. Ref.,Jan. 2009, pp. 1–384.
[4] R. Chu, S. Liao, Y. Han, Z. Sun, S. Z. Li, and T. Tan, "Fusion of face and palmprint for personal identification based on ordinal features," in Proc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR), Jun. 2007, pp. 1–2.
[5] D. Zhang, W.-K. Kong, J. You, and M. Wong, "Online palmprint identification," IEEE Trans. Pattern Anal. Mach. Intell., vol. 25, no. 9, pp. 1041–1050, Sep. 2003.
[6] A.-W. K. Kong and D. Zhang, "Competitive coding scheme for palmprint verification," inProc. 17th Int. Conf. Pattern Recognit.,vol.1. Aug. 2004, pp. 520–523.
[7] W. Zuo, Z. Lin, Z. Guo, and D. Zhang, "The multiscale competitive code via sparse representation for palmprint verification," inProc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR), Jun. 2010, pp. 2265–2272.
[8] Z. Sun, T. Tan, Y. Wang, and S. Z. Li, "Ordinal palmprint represention for personal identification [represention read representation]," in Proc. IEEE Conf. Comput. Vis. Pattern Recognit., vol. 1. Jun. 2005, pp. 279–284.
[9] A. Kong, D. Zhang, and M. Kamel, "Palmprint identification using feature-level fusion," Pattern Recognit., vol. 39, no. 3, pp. 478–487, Mar. 2006.
[10] D. S. Huang, W. Jia, and D. Zhang, "Palmprint verification based on principal lines,"Pattern Recognit., vol. 41, no. 4, pp. 1316–1328, Apr. 2008.