

A REVIEW PAPER ON PERSONAL IDENTIFICATION WITH AN EFFICIENT METHOD OF COMBINATION OF LEFT AND RIGHT PALMPRINT IMAGES

Dipalee M. Kate¹, Nita Lagdewar²

¹Assistant Professor, Dipalee M. Kate, Dept. of ECE, Priyadarshini Bhagwati college of Engineering, Maharashtra, India

²Nita Lagdewar, Dept. of ECE, Priyadarshini Bhagwati college of Engineering, Nagpur

ABSTRACT- *Multibiometrics provides high standard security and better accuracy than any other single biometric. Palmprint identification achieves a high accuracy because it contains principle curves, wrinkles and texture and also rich texture and miniscule points. In this paper, we perform multibiometric by combining left palm print and right palmprint at matching score level fusion. The first two kinds of score were obtained from palmprint identification method. For third kind of score, we propose a special algorithm which takes the nature of left and right palmprint images. It can properly exploit the similarity between left and right palmprint of same object.*

Keywords: Multibiometrics, SIFT, Multimodal.

1. INTRODUCTION

During the last years there has been an increasing rise of automatic personal recognition systems. Palmprint based biometric approaches have been intensively developed. Because they possess several advantages over other systems. Palmprint a large inner surface on our hand contains many line features. For example: principal lines, wrinkles and ridges. Because of the large surface and the rich line features, we expect palm prints to be robust to noise and to have high in individuality. To overcome the limitation of unimodal biometric technique and to improve the performance of the biometric system, multimodal biometrics. Use of multiple biometric indicators for identifying individuals Known as Multimodal biometrics. Using an effective fusion scheme can significantly improve the overall accuracy of the biometrics system obtained from the combining evidence from different modalities.

Fusion in multimodal biometric system can be performed at four levels: In the Image Level, different sensors are usually required to capture the image of same biometric. At Decision Level, fusion at decision level is too rigid. It only abstracts identity labels decided by different matchers. At Feature level, it involves the use of feature set by concatenating several feature vectors to form large 1D vector. It provides better identification accuracy than fusion at other levels.

At the Matching score level, the final matching score is generated from three kinds of matching scores. The first and second matching scores obtained from left and right palm print reps. The third kind of score is calculated based on the crossing matching between the left and right palm print.

In this paper, we proposed technique which combines the left with right palmprint at the matching score level. The framework contains three types of matching scores which are obtained by the left palmprint matching, right palmprint matching and crossing matching between the left query and right training palmprint and they are fused to make the final decision. It combines the left and right palm print images for identification and also properly exploits the similarity between the left and right palmprint of the same subject. The proposed framework can integrate most conventional palm print identification methods for performing identification and can achieve higher accuracy than conventional methods.

2. LITERATURE SURVEY

1. R.K. ROWE, "A multispectral whole-hand biometric authentication system", Refer to [7], in 2007, A

multispectral whole-hand biometric system has been developed. Its main objective is to collect palm print information with clear fingerprint features and pre-processing. The speed of feature extraction is very low. And

feature matching make it unsuitable for real time application. Therefore enhancement can be made in the system by applying many other palmprint techniques so as to increase the accuracy of proposed system.

2. Y. Hao, Z. Sun, and T. Tan, "Comparative studies on multispectral palm image fusion for biometrics". Refer to [6], in 2007, Contact-free multispectral palm sensor architecture has developed for identifying the palm printing for security and authentication. Recognition accuracy is not so high because the image quality is very limited. So less accuracy in the proposed system there can be enhancement of system can be achieved by applying many other palmprint techniques.

3. FengYue, Wangmeng Zuo and Kuanquan Wang, "FCM-based Orientation Selection for Competitive Coding-based Palmprint Recognition". Refer to [3], in 2010, FCM-based orientation Selection has proposed for Competitive Coding-based Palm print Recognition. In this paper they concentrated on the security issues and tried to overcome all the issues, in this prospective they used statistical orientation distribution and the orientation separation principle and modified fuzzy C-means cluster algorithm to determine the orientations of filters. This method achieves higher verification accuracy while compared with that of the original competitive code and several state-of-the-art methods.

4. X. Wu, Q. Zhao, and W. Bu, "A SIFT-based contactless palmprint verification approach using iterative RANSAC and local palmprint descriptors." Refer to [1], in 2014 SIFT-based Image Alignment has been proposed for Contactless Palm print Verification. They proposed a contactless palm print recognition method with a precise palm print image alignment. The original contactless palm print images are firstly aligned using a projective transformation model that estimated from matched SIFT feature points. From the obtained images, an exact palm print feature representation method, the competitive code, is extracted and matched. Finally, matching scores of both SIFT and competitive code is fused to further improve the accuracy. Experiments on a public contactless palm print database show that after the image alignment, the verification accuracy of competitive code has increased dramatically, and the result is further enhanced by fusing the matching scores of competitive code and SIFT features.

Different Palm Print Identification Methods

A) Line Based Method

Lines are the basic feature of palmprint and Line based methods use lines or edge detectors to extract the palmprint lines and then use them to perform palmprint verification and plays an important role in identification. The palms have three principal lines: the heartline, headline, and lifeline, which are the longest and widest lines in the palmprint image and have stable line shapes and positions. Thus, the principal line based method is able to provide stable performance for palmprint verification. Palmprint principal lines can be extracted by using the Gabor filter, Sobel operation, or morphological operation. In this paper, the Modified Finite Radon Transform (MFRAT) [5] method is used to extract orientation feature of palm print accurately. In matching stage two strategies are applied to improve the robustness of matching. In the first one to overcome large rotation problem caused by imperfect pre-processing. There is an enlargement of training set established. Another one is that a matching algorithm based on pixel -to -area comparisons was designed. This algorithm has better fault tolerant ability for slight translations, rotations and distortions.

B) Coding Based Method

The most influential palmprint identification method is the Coding based method. Representative coding based competitive code method, ordinal code method, palmcode method and Binary Orientation Co-occurrence Vector (BOCV) [4] method. Coding based methods, which encode the response of a bank of filters and have been very successful in palmprint representation.

After convolving the palmprint image with 2D Gabor filters, the palm Code method encodes the phase of the filter responses as binary features. To reduce the spatial correlation of Palm Code, Fusion code method introduces encodes the phase of the filter response whose magnitude is maximum.

The competitive code, the ordinal code and the robust line orientation code (RLOC) are orientation coding methods which involve three components: the filter bank design for extracting the palmprint orientation information, the coding scheme for and efficient representation of orientation information, and the matching approach for fast and accurate palmprint recognition. A binary orientation co-

occurrence vector (BOCV) method to represent multiple orientations for a local region.

C) Representation Based Method

All representation based methods can be easily applied to perform palmprint identification. The representation based method uses training samples to represent the test sample, and selects a candidate class with the maximum contribution to the test sample. The Collaborative Representation based Classification (CRC) method, Sparse Representation-Based Classification (SRC) method and Two-Phase Test Sample Sparse Representation (TPTSSR) [1] method are two representative representation based methods.

D) SIFT Based Method

SIFT was originally proposed in [8] for object classification applications, which are introduced for contactless palmprint identification in recent years. Because the contactless palmprint images have severe variations in poses, scales, rotations and translations and scale variations and hence promising to solve the deformation problem.

E) Subspace Based Methods

Subspace based methods include the LDA and PCA. The key idea behind LDA is to find an optimal projection matrix $1V$ and transforms the original space to a lower-dimensional feature space. LDA maximizes the Euclidean distance of samples from different classes and also minimizes the distance of samples from the same classes. PCA is used to find an orthogonal subspace that preserves the maximum variance of the original data. This method tries to find the best set of projection directions in the sample space that will maximize the total scatter across all samples.

3. PROPOSED METHOD

Apply the palmprint identification method to the right palmprint images to calculate the score of the test sample with respect to each class.

The weighted fusion scheme is used by using Matlab software to find score of the test sample. After crossing matching scores of left palmprint images for testing with respect to the Reverse right palmprint images of each class is obtained.

4. ADVANTAGES

- 1) The proposed weighted fusion scheme uses a method to integrate the three kinds of scores generated from the left and right palmprint images.
- 2) The proposed framework obtains very high accuracy and the use of the similarity score between the left and right palmprint leads to important improvement in the accuracy.

5. APPLICATIONS

Combining left and right palmprint images by using matching score level fusion used for personal Authentication, so used in every section Military, Bank and Forensic Department.

6. CONCLUSION

In this paper, we recognize that left and right palmprint images of same object are similar. The weighted fusion scheme uses a method to integrate the three kinds of scores generated from left and right palmprint images.

REFERENCES

- 1) X. Wu, Q. Zhao, and W. Bu, "A SIFT-based contactless palmprint verification approach using iterative RANSAC and local palmprint descriptors," *Pattern Recognition*, vol.47, no.10, pp.3314-3326, Oct. 2014.
- 2) Y. Xu, D. Zhang, J. Yang, and J-Y. Yang, "A two-phase test sample sparse representation method for use with face recognition." *IEEE Trans Circuits Svst. Video Technol.*, vol. 21, no. 9, pp. 1255—1262, Sep. 2011.
- 3) FengYue, Wangmeng Zuo and Kuanquan Wang, "FCM-based orientation selection for competitive coding based "Palmprint Recognition", *Biocomputing Research*, and school of computer science and Technology, Harbin Institute of Technology, Harbin, China, 2010.
- 4) Z. Guo. D. Zhang. L. Zhang, and W.Zuo, "Palmprint verification using Binary orientation co-occurrence vector," *Pattern Recognit Letts.*, vol. 30 No.13. PP. 1219-1227. Oct. 2009.

- 5) D. S. Huang, W Jia, and D. Zhang, "Palmprint verification based on principal lines" Pattern Recognir., vol. 41.no. 4.pp. 1316-1328.Apr. 2008.
- 6) Y. Hao, Z. Sun, and T. Tan, "Comparative studies on multispectral palm image fusion for biometrics," in Proc. Asian Conf. Comput.Vis, pp. 12-21, 2007.
- 7) R. K. Rowe, U. Uludag, M.Demirkus,S. Parthasaradhi, and A.K.Jain"A multispectral whole-hand biometric authentication system," in Proc. Biometric Symp., Biometric Consortium Conf., Baltimore, MD, pp. 1-6, 2007.
- 8) D.G.Lowe, "Distinctive image features from scale-invariant keypoints." int. J. Comput. Vis., vol. 60.no.2, pp. 90-110. Nov. 2004.