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A Review of Identity Recognition System Based on Biometrics

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ABSTRACT

Personal identity recognition system based on biometrics is an effective method to recognize any person automatically with great accuracy and confidence. Palmprint is one of the biometric traits which are used to identify any person with accuracy. There are two types of features in palmprint that is structural feature and statistical features, structural feature can be extracted easily. The statistical feature such as creases are there in palmprint in large number. These creases remain approximately stable in person's whole life and which qualifies as features in palmprint recognition. Here in this paper different approach to personal identification based on palmprint is studied.

I. INTRODUCTION

In last two decade a sequence of automated identification system based on biometric is evolved such as identification system based on fingerprint, palmprint, iris, voice, finger knuckle, pulse of vain etc. [1]. It is considered that all other kind of identification system is outstanding at their place but here in this paper emphasis is given on study of palmprint based identification system. Palmprint, as a new biometric feature, has several advantages compared with other ones; hence it draws more attention of researchers get attracted [5-8]. Palmprint based identification system and fingerprint based identification system has some extent of similarity in functionality and its features. But the most significant feature of palmprint is its creases which are insignificant in fingerprint though there is similarity in between pamprint and fingerprint features. The fingerprint also has creases but they are dense and jolt, extraction of these features in fingerprint is a bit difficult compared to minutiae detection [2]. Where as in palmprint, these creases remain nearly as it is throughout the life and easy to extract, hence it could be considered the best feature for identification of a person in palmprint based identification system [3].

II. METHODS AND MATERIAL

Extraction Method: There is no standard definition of crease exist neither in mathematical nor in algorithm form. Any point in the crease has two features:

1. The direction has deviation from neighbor pixels.
2. It's located at a long and narrow region whose width has a large deviation from the neighbours.

These two types of above-mentioned crease in palmprint is shown in the image below-

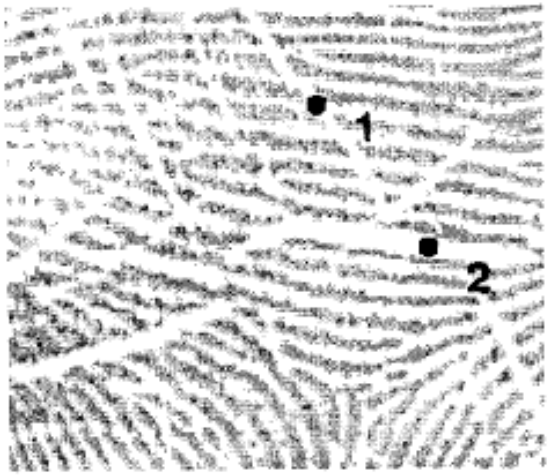

Fig. 1. The number 1 indicates a crease point of type I, the number 2 type 2[4].

To get crease points, an algorithm developed which takes use of a new direction map computing method and performs a twostep local analysis [4]. The palmprint features are classified as structural and statistical whereas texture energy belongs to statistical feature and lines in palmprint belongs to structural feature. The structural feature can recognize or discriminate palm strongly as the feature of it is lines in palm that remains almost same throughout the life [9]. But the line structure feature based palmprint system has many problems such as lines are very difficult to extract form blur palmprint image as shown in Fig.2, another problem is principal lines and wrinckles are not able to discriminate a person as there are many palmprint have similar line features as shown in Fig.3

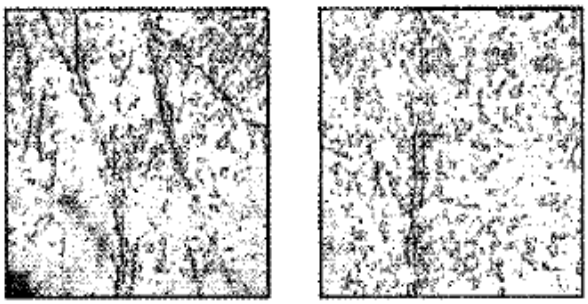

Fig.2- Some unclear lines palmprint images[10]

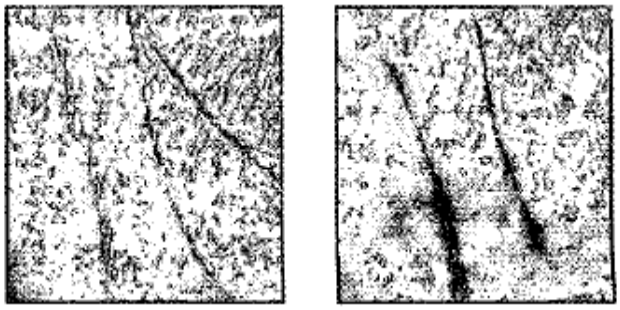

Fig.3- Some palmprints with similar lines[10]

The different feature of palmprint have different resolution and the principal lines are very thick hence they can be identified with low resolution and the wrinkles are thinner than principal line and then they can be analyzed in medium resolution and the ridges are thinnest and can be analyzed in high resolution. Hence, powerful multi-resolution analysis tool two-dimensional wavelet transformations can decompose the image in several directions and hence widely used [10].

III. RESULTS AND DISCUSSION

PALMPRINT RECOGNITION ALGORITHM: For simplicity line segments are compared which comprise the creases. Match finding algorithm in its first stage adjust the image for counteracting rotational and translational transforms. It generates the gray image then this gray image is compared and similarity coefficient is used for matching [4]. Here in this approach image line segments are adjusted and compare the line segments and count how many line segments are matched, the result is not satisfactory, it becomes had to decide one line segment matches the other, sometimes one segment matches the part of other and at sometime it is found that the two segments have the mutual sub-segments. To deal with this the gray image is generated from the crease line segment.

IMAGE MATCHING: Once the gray image is generated the pixels to pixels image matching is done.

If two pixels have the close direction then it is matched of hit. The summations of hits of two images show how similar two images are. In fuzzy directional energy based palmprint identification directional element based features are extracted through these stages such as contour extraction, dot orientation, vector construction after this line edge detection is done through these stages such as fuzzy dot orientation, fuzzy directional element energy feature construction.

IV.CONCLUSION

Research on palmprint based on crease shows that creases can be extracted correctly and more, based on the creases, the palmprint matching algorithm has great result. The crease will play an important role in palmprint analysis [4]. Fuzzy Directional Element Energy Feature can be extracted, represented and compared easily and has a strong ability to distinguish palms. Its rotation and translation robustness will be investigated in future work [9]. According to the fact that the different features have different resolution on palm, a novel palmprint feature; named wavelet energy feature**,** is defined based on wavelet. Wavelet Energy Feature can reflect the wavelet energy distribution of the principal lines, wrinkles and ridges at different scales, so it can discriminate palmprints effectively [10]. In this paper different approach of palmprint recognition is studied and the conclusion based on it is presented.

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