A Coarse to Fine Minutiae-Based Latent Palm print Matching and fusion

P. Kavya¹, J. Refonaa²
Sathyabama University¹, Faculty of Computing²
M.E Computer Science and Engineering¹, Sathyabama University²
Chennai-600119, India

ABSTRACT
In this paper, a coarse to fine matching strategy based on minutiae clustering and minutiae match propagation is designed specifically for palmprint matching and to deal with the large database and local feature-based minutiae clustering algorithm is designed to cluster minutiae into several groups such that minutiae belonging to the same group have similar local characteristics. The proposed palmprint matching algorithm has been evaluated on a latent-to-full palmprint database consisting of 44 latents and 12,489 background full prints. Our method involves image acquisition via a dedicated device under contact-free and multi-spectral environment, preprocessing to extract features and locate region of interest (ROI) from each individual hand images, future-level registration to combine ROIs from different spectral images in one sequence and fusion to combine two multispectral palm images. The matching results show a rank-1 identification accuracy of 80 percent, which is more accurate than the state-of-the-art latent palmprint matching algorithm. The computation time of our algorithm is an order of magnitude faster than a previous algorithm.

Keywords— Latent palmprint matching, minutiae clustering, minutiae descriptor, ROI, match propagation.

I. INTRODUCTION
Palmprints recognition has a considerable potential as personal identification/verification technique which share most of the discriminative features with finger prints and in addition possess much larger skin area and other discriminative features such as principal lines for access control, scanning the palmprint is not only fast technique but also highly acceptable for the public.

II. RELATED ARTICLES
[1] Heeseung Choi, Kyoungtaek Choi, and Jaehie Kim In this paper, they developed a novel high-resolution palm print recognition system, which can handle palm prints with large amount of crease, leading to higher accuracy than the previous systems. The main contributions are: First use of multiple features for palmprint recognition to significantly improve the matching accuracy. Second design of a quality based and adaptive orientation field. It can reliably estimate the ridge direction by adaptively choosing suitable estimation method according to the image quality. Third use of a novel heuristic rule for identification applications to combine different features. Fourth the discriminative power of different feature combinations is analyzed and we find that density is very useful for palm print recognition.

[2] Jifeng Dai, and Jie Zhou (2011) we discover two low discriminative regions in fingerprint and propose an effective approach to detect minutiae in such regions. In order to improve low quality fingerprint matching, we propose to use neighbours of a minutia to measure its quality and incorporate the quality to minutiae similarity calculation. Experimental results over FVC-onGoing demonstrate the proposed approaches is effective.

[3] Adams Kong, David Zhang, Mohamed Kamel (2009) In order to improve the performance of minutiae-based fingerprint matching algorithm, we take the minutiae discriminability into account. In the light of minutiae distribution characteristic, we discover two low discriminative regions in fingerprint and propose an effective approach to detect minutiae in such regions. In order to improve low quality fingerprint matching, we propose to use neighbours of a minutia to measure its quality and
incorporate the quality to minutiae similarity calculation. Experimental results over FVC2004 and FVC-onGoing demonstrate that the proposed approaches demonstrate the proposed approaches is effective, however matching processes including minutiae similarity calculation, alignments and orientation reconstruction all are time consuming.

III. SUMMARY OF EXISTING SYSTEM

Biometric based recognition systems have wide applications in the field of personal verification. Fingerprint based systems are most widely used while iris based systems are considered to be most reliable. The palmprint is the region between the wrist and fingers. It has features such as texture, wrinkles, principle lines, ridges and minutiae points that can be used for its representation. Other biometric traits, palmprints also satisfy the critical properties of biometric characteristics such as universality, uniqueness, permanence and collectability. If the subject is not able to expose the palmprint to the scanner completely due to medical injuries or being physically challenged, the systems fail to perform at their best. These spurious minutiae could lead to many false initial minutiae pairs. Certain types of latent palmprints called writer’s palmprints might have very small overlap which makes it difficult to find number of true minutiae correspondences.

IV. DRAWBACKS

Two dimensional operations are found to be computationally more intensive and slow down the identification process. The technique used to extract features and to match features is found to be computationally expensive. To compare the fingerprints and its region is larger than a fingerprint. The EER of our algorithm is 10 times lower than that of the segment based. Due to the presence of immutable creases in palm prints and uncontrollable image acquisition conditions, a large number of spurious minutiae might be extracted especially in palm print images.

V. PROPOSED SYSTEM

The proposed palmprint matching Our method involves image acquisition via a dedicated device under contact-free environment; preprocessing to locate region of interest (ROI) from each individual hand images, feature-level registration to align ROIs from different palm images in one sequence and fusion to combine images for more accurate identification. The matching results show a rank-1 identification accuracy of 79.4 percent, which is significantly higher than the 70.8 percent identification accuracy of a state-of-the-art latent palmprint matching algorithm on the same latent database. The average computation time of our algorithm for a single latent-to-full match is about 141 ms for genuine match. the proposed system handles Uncontrollable latent image quality. Small area of latent palmprints compared to full palmprints. Large nonlinear image distortion and large number of spurious minutiae.

CONCLUSION

This paper shows that fusion of multispectral images to deal with the different spectral in palmprint images, a minutiae clustering algorithm is proposed to group minutiae into several clusters based on the local feature in minutiae neighbourhood. by Kalman filter technique and ROI used to locate the region of interest and selected minutiae correspondences are fed to a fine matching procedure, called minutiae match propagation, to establish the minutiae correspondences in the whole palmprint.

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REFERENCES


