

Human Identification Using Major And Minor Finger Knuckle Pattern : A Survey

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ABSTRACT

Finger-Knuckle– Print defined with its rich texture is becoming a new challenge to identify completely automated approach for the minor finger knuckle identification is developed with key steps for region of interest segmentation, image normalization, enhancement, and robust matching to accommodate image variations. This paper also introduces a new or first publicly available database for minor (also major) finger knuckle images from 503 different subjects. By using major and minor finger knuckle we can accurately find out human The efforts to develop an automated minor finger knuckle pattern matching scheme achieve promising results and illustrate its simultaneous use to significantly improve the performance over the conventional finger knuckle identification. Several open questions on the stability and uniqueness of finger knuckle patterns should be addressed before knuckle pattern/image evidence can be admissible as supportive evidence in a court of law persons.

Keyword: - major finger knuckle, minor finger knuckle, finger dorsal biometrics, knuckle segmentation, local binary patterns

1. INTRODUCTION

Automatic identification of humans using their unique anatomical characteristics has been increasingly investigated for their applications in human surveillance and image forensics. Emerging national ID programs that require accurate, online and large scale identification automated personal identification have posed new challenges for the bio- metrics technologies. The unique identification project is one such ambitious project that aims to identify 1.2 billion population using ten fingerprints and two iris images. Selection of biometrics modalities in such large scale identification problems is not only limited by the individuality of the modality but also by the user-convenience in acquiring the respective modality. This paper focuses on this problem and investigates the possibility of using minor finger knuckle pat- terns for the biometric identification. Fingerprint, Hand/Finger Geometry, Signature verification, Keystroke Dynamics, and other esoteric biometrics. Hand-based biometrics, such as fingerprint and hand geometry, is the most prevalent biometric system in the marketplace. In this context, the finger-vein and finger knuckle images can be simultaneously acquired while acquiring the fingerprint images and with no additional inconvenience to the users. Simultaneous acquisition of finger-vein images can however require some alterations in the existing (slap) fingerprint devices, largely due to the near infra red based intrusive imaging requirements for finger-vein imaging. However, the finger knuckle images can be simultaneously acquired with the addition of an external imaging camera that simultaneously acquires finger dorsal images and synchronizes the acquisition with external software. Therefore it is important to ascertain the nature of information that can be extracted from the finger dorsal images. However, fingerprint suffers from a major drawback, which is its proneness to anti security threats, such as the reproduction of fingerprints left on surfaces to deceive the system. On the other hand, the hand geometry features are not descriptive enough for identification when the number of users grows larger. Problem related to other identifiers are as human voice and signature can be copied, duplicates are available so face Finger Knuckle Anatomy A normal human hand has four fingers and a thumb. Each of the fingers has 3 bone segments with 3 joints and the thumb has 2 bone segments with 2 joints. These segments are known as phalanges (plural of phalanx). There are three bones in every

finger known as the proximal phalanges, the centre phalanges and the distal phalanges. The proximal phalanx is the first joint where the finger joins the hand. The proximal interphalangeal joint, or PIP joint is the second joint. The distal interphalangeal joint or DIP is the last joint of the finger.

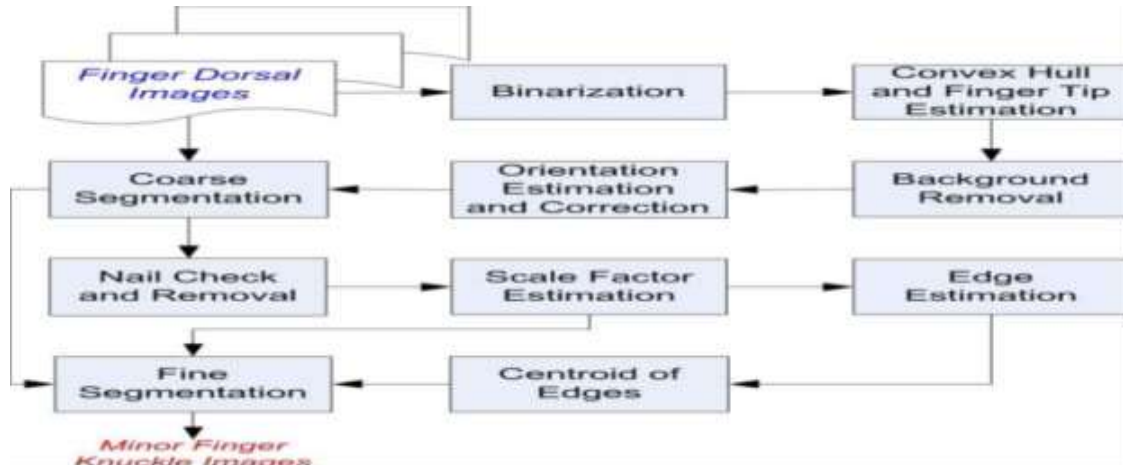


Fig -1 Figure 4: System Architecture

2. LITERATURE SURVEY

Literature survey is very important for gaining and understanding much more knowledge about specific area of a subject. A. Kumar, senior member, IEEE[2],The likelihood of employing minor finger knuckle images for the identification. The coarse-to-fine segmentation strategy developed in this paper has been quite self-made because it has been able to achieve higher matching accuracy. The experimental results illustrated during this paper, on the info of 503 subjects, can achieve promising performance (EER of 6.29from solely mistreatment contactless minor finger knuckle images. The experimental results according during this paper conjointly recommend that the synchronous use of major and minor finger knuckle images will help to considerably improve the performance which will not be attainable by victimization either minor or major finger knuckle images alone.

2.1 Segmentation and Normalization

Accurate personal identification using minor finger knuckle patterns will require accurate segmentation of region of interest images. The segmentation approach should be able to generate normalized and fixed size region of interest images from the finger dorsal images of subjects under varying age group. In absence of any fixation pegs or the finger docking frame, the acquired finger dorsal images illustrate fingers with varying poses, locations and scale changes. In addition, the varying length of fingers, finger-widths, finger-nails, skin pigmentation and location of distal inter phalangeal points, poses severe challenges to exploit any anatomical characteristics of fingers for robust minor finger knuckle segmentation.

2.2 Image Enhancement

The Segmented minor finger knuckle images often have low contrast and illumination variations. The enhancement steps are essentially required to normalize such illumination variations. The illumination normalization approach used in this work is same as also used in [8]. This approach firstly estimates the average background illumination in the 16 16 pixels sub-blocks of the segmented knuckle images. The estimated illumination is then subtracted from the original knuckle image to remove the uneven illuminations. The resulting image is then subjected to the histogram equalization operation which generates enhanced minor finger knuckle image for the feature extraction stage.

2.3 Feature Extraction and Matching

The most important semantic information about an image is provided by shape feature. Shape features are usually described using region or part of an image. The accuracy of shape features mainly depends upon the segmentation scheme used to divide an image into meaningful objects. Therefore a variety of spatial and spectral domain feature extraction strategies can be pursued to ascertain the matching accuracy from the minor finger knuckle images. The experimental results in this paper have employed local binary patterns [9], improved local binary patterns band limited phase only correlation and 1D log-Gabor filter based matchers for the performance evaluation.

2.4 Local Binary Patterns

The local binary patterns (LBP) encoding can acquire local knuckle patterns and also represent multi-scale texture appearances. Improved LBP (ILBP) is one such variant that uses mean value of neighborhood pixels for binarization (1), instead of center value used in LBP, and has also been investigated in this work. The ILBP enables us to utilize the gray level of center pixel and may deliver superior performance as the resulting LBP descriptor becomes more robust to the noise influencing the center pixel

4. PROPOSED SYSTEM

To overcome the limitations of existing system new technique which is called finger knuckle patterns has cautioned the use of finger knuckle images for any commercial applications and therefore there is pressing need for systematic/scientific study in this area. Accurate segmentation of stable major and minor finger knuckle regions is significantly important as it can control the achievable identification accuracy from the finger dorsal images.

5. CONCLUSION

The main purpose of this survey is to provide a brief idea about Human Identification Using Major And Minor Finger Knuckle a survey which identifies human beings on basis of both minor and major finger knuckle images for the biometric identification. The coarse-to-fine segmentation strategy developed in this system is able to achieve higher matching accuracy. The finger dorsal images in this system acquires the accuracy points towards the uniqueness of major/minor finger knuckle patterns in the given database rather than on the stability of such patterns with time.

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