ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

Matching Latent Fingerprint Using Texture and Minutiae Based Descriptor

[1]Evangelin M.S. Beulah, [2]J.P. Jayan, [3]Dr. M.K. Jeyakumar,
[1]Research Scholar in Computer Science, Noorul Islam Centre for Higher Education, Kumaracoil.
[2]Research Scholar in Computer Science, Bharathiyar University, Coimbatore.
[3]Professor in Computer Applications, Noorul Islam Centre for Higher Education, Kumaracoil.

Abstract: Minutiae-based latent fingerprint matching method is one of the supreme current approaches in fingerprint matching. Due to its high performance, less time consumption and high quality image it is used in business applications. A latent fingerprint contains an outline of ridges and valleys on the plane of a fingertip. The ridges have endpoints and crossing points which are called as minutiae. The minutiae pattern which is present in every finger is fixed and stable. And this minutia is used in fingerprint matching process. In minutiae matching method, it aligns the minutiae present in the input image and stored that in templates after that it finds the number of minutiae matched. Generally, a minutiae-based matching algorithm has to resolve two problems which occurred during fingerprint matching that are correspondence and similarity computation. To solve the correspondence problem use two descriptor such as texture based and minutiae based descriptor. And a greedy algorithm is also used to provide a similarity among the minutiae present in fingerprints. A 17-D feature vector is computed from the matching result and converted to a matching score by using a support vector classifier. The proposed algorithm was tested on local databases and compares it with all the participators in local database in the proposed algorithm.

Keywords*:* Latent fingerprint, Ridge patterns, Minutiae

I. INTRODUCTION

The process by which the computers automatically allocate the metadata in the type of keywords to digital images is called as automatic image annotation. The automatic image annotation is also known as linguistic indexing and automatic image tagging. The computer vision method application is used in image retrieving system to establish and trace the image from database.

In AFIS Fingerprint identification is a most important biometric method. It automatically verifies and detects the individual's fingerprints. A normal fingerprint recognition method constitutes some vital steps they are extracting features, preprocessing, matching etc. To recognize an element with its storage details a descriptor is used. In this a fingerprint descriptor is used to recognize and denote a fingerprint image. The descriptor fingerprint was divided into two types they are minutiae based and non-minutiae based. Within these two descriptors a minutia based descriptor is a widely used method to recognize the fingerprints. The fingerprints are matched based on the minutiae features in fingerprints such as ridge ending and bifurcation.

The minutiae features such as the position, type and orientations are extracted by a feature vector extractor which is used in the minutiae descriptor. The sharp ending of ridge which is present in the fingerprint is called as ridge ending. The endings where the ridge gets divide or deviates in fingerprints are called as ridge bifurcation. The combination of both these characteristics is called as minutiae. A high quality of fingerprint comprise about 40–100 minutiae.

The latent fingerprint contains partial print of fingers so the minutia present is less. The fingerprint characteristic was described as two features. One is set of bifurcation and the other is small ridge. The ridge ending and bifurcations minutiae have three characteristics such x-coordinate, y-coordinate, and local ridge direction. The remaining features are extracted from the three dimensional feature vectors.

The problem in matching can be calculated by finding a match level between the reference and uncertain fingerprints. Many methods were used to match the minutiae. The matching process requires three features that are the uncertain fingerprint quality is poor, the database of fingerprint was very large and the distortion for fingerprint image should be need high rate matching algorithm. Many

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

other feature techniques were also used to reduce the search space.

The Fingerprints was divided into five types they are,

- Arch
- tented arch
- left loop
- right loop
- Whorl

In latent or partial fingerprints the classification of pattern is uncertain. In fingerprint the ridge density was used as an advanced feature. The ridge density can be calculated by the total number of ridges present in a part of distance. The singular point in fingerprint was distinct as core point and delta points. The peak points on the inner ridges are called core points and the three radial points which contain three edges roaring from them called as delta points. The delta and core points are the universal features of fingerprints.

The singular points are used in fingerprints to minimize the search space. To detect the change in gradient ridge vector a singular point is used. In the field direction the Singular points is describe as discontinues. A new algorithm was used to evaluate the local ridge gradient. The customized method called squared average gradients is used to detect the path of smooth gradient vectors. The extraction of fingerprint singularity points has three types they are directional image extraction, core and delta extraction and Poincare index calculation.

Finger points: In fingerprinting term, finger points are the point of interest in a fingerprint, Such as bifurcations (a ridge splitting in to two) and ridge ending as shown in fig 1.1.

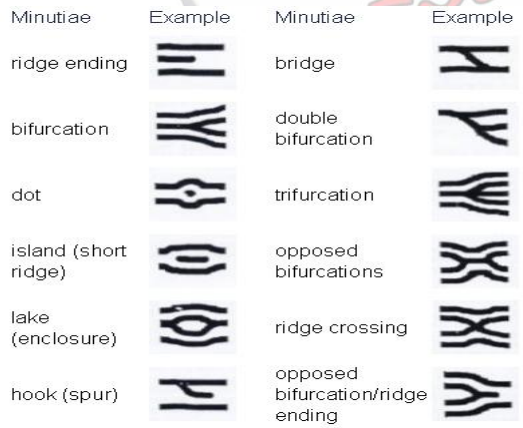


Fig 1.1: Finger points

The minutiae matching method is an extensively used matching technique. The similarity between the minutiae was uncertain and each and every minutia present in one fingerprint was matched with minutiae of other fingerprint. It has two descriptors called texture based descriptor in this it captures the orientation and frequency information around a minutia, and minutiae-based descriptor this return the relationship between a minutia and nearby minutiae. Both the descriptors are combined to increase the uniqueness of minutiae. Based on the similarity between the minutiae present in the fingerprint, a matching score is calculated to characterize the similarity level between two fingerprints. The matching score is stabilized. For getting matching result a 17-D feature vector is used. It imitates the degree of matching minutiae, image orientation, image frequency, near ridges of minutiae and singular points.

To improve the speed and matching accuracy of descriptor based minutiae matching algorithm. Since existing fingerprint quality assessment algorithms are designed to examine if an image contains sufficient information for matching, they have limited capability in determining if an image is a natural fingerprint or a latent fingerprint.

Session 1 gives the overview of Fingerprint and its related identification marks. Session 2 describes the related work, Session 3 describe the present investigation and it demonstrated carefully and the proposed algorithm and Image are implemented in Mat lab based platform for Finger print image analysis and detection. In session 4 the result of this dissertation is presented and the discussions are made, I have stated about the result and discussion of my work. Finally in session 5, I narrated about the conclusion and future enhancement followed by references.

II. Related Work

The fingerprint recognizing methods previously used are not able to identify the low feature or quality fingerprint image. To conquer this problem a method called correlation was used it gives a better result when compared to the earlier methods. The use of correlation method gets increased due to its accurate output and it is also used in biometrics field. But this method will provide some error. So a new method called normalized cross correlation is used to reduce the rate of error and also it will minimize the cost of computation. But it faces some limitations that it will be more reactive in error regions. A registration method was used in fingerprint matching technique used to arrange the templates and the fingerprints. The registration method

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

improves the statistical alteration happens between two impressions of fingers. In the registration method a false acceptance will occur. To reduce this several methods introduced but they did not provide better results. Lastly a Secondary feature based method is introduced it improves the overall output accuracy rate and also it improves the speed of the process. To rebuild the pose transformation in fingerprints impression a generalized Hough transform method is used. It arranges the ridge curves which is present between two similar minutiae. But it needs large computational and storage space.

The vector of image pixel is normal descriptors. When compared to the earlier methods SIFT the GLOH method provides better results. This is a robust method and it has a unique character for region based SIFT. In this method the shape of the image is retrieved well but it fails in the edge regions. So it has only a low score value. The descriptor such as moment gradients and steerable filters are considered as low dimensional descriptors.

When the high dimensional descriptors such as histogram descriptors get problem the small dimensional descriptor is used as alternate. This method provides less result. To improve the result a derivative multiplication is used it rotate the invariance. The area which is denoted by Hessian Laplace and Hessian Affine was regard as an error. But in Hessian regions the output is high when compared with Harris regions. The Cross correlation method is proposed in this paper to calculate a match score between two descriptors.

In this descriptor the matching process is done in the background and it identifies the similar object in different conditions. The method initially Choose the descriptor number which provides a high output for background matching and scenes comparison. And then it retrieves the image from the datasets. The rate of detection is same as evoke. But the false rate is extract only from the image database. So the accurate false matching could not be predicted easily. So a local feature was used to recognize the object.

The method is checked out in various descriptors and in various matching methods and in various regions of interest. Many detectors was also included to the database contains transformation and type of scene. The ranking in this method is as similar as Roc method. The elastic method contains three factors for arranging the minutiae that are angle, distance and direction. It takes much time to finish the process. In this paper the context shape, invariants, spin image, SIFT, steerable filters cross correlations and complex filters are compared with several types of interested region. Among the low dimensional descriptor, the steerable filters and moments provide better result. Scale and affine invariant detection algorithm was designed for matching and recognizing the same object or scene.

The fingerprint distortion will affect the accuracy of matching in fingerprints. There are two reasons which cause the fingerprint to distort. The first one is, fingerprint which was captured in different distortion manner. Second one is the distortion introduced to fingerprint by using the non orthogonal stress apply by the people on the sensor. The main problem in fingerprint identification is coping the distortion of fingerprints.

Many fingerprint recognition algorithms are used to match the fingerprints based on minutiae matching. It was distinct to contract with the false minutiae present in the fingerprint. A critical step in fingerprint matching is extracting the minutiae from the input fingerprint images. The performance of a minutia extraction algorithm was depends on the quality of the input fingerprint images.

In an ideal fingerprint image, the ridges and valleys interchange and stream in a local constant direction and minutiae are anomalies of ridges such as ridge endings and ridge bifurcations. In such situations, the ridges can be simply detected and minutiae can be specifically located from the thinned ridges. In this the distance between true minutiae is generally greater than the threshold. While near the spurious minutiae, there are usually other false minutiae is also present. The spurious minutiae are usually detected at the edge of the Fingerprint image.

By this method the true or false minutiae is detected .Then the algorithm aligns the pattern and input fingerprints using the registration method and the robustness of global alignment is improved using a local topological structure matching method. Local topological structure match is used here to improve the robustness of the matching process. Secondary feature-based matching method, network-based matching method, neural network method and convex hull-based methods are used. Partial fingerprint, Similarity score, Minimum cost flow, Minutia Fingerprint matching are the parameters used. In complete matching or the partial fingerprint is a vital issue in fingerprint matching system. In fingerprint matching, the matching of small incomplete fingerprint to full image in the list have some issues like the count of minutiae present in the fingerprints this will decrease the power of discrete.

Registration method, GHT method were used. Fingerprints, matching, minutiae, orientation features are the parameters used. The fingerprint of humans was used in the

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

identification process. The fingerprints which are present in humans have a ridge pattern and characters. Due to the fingerprint characteristic such as permanent and uniqueness it is used in person identification.

III. PROPOSED WORK

Here, a new technique is to segment all fingertips from a latent-image and to identify them in to their corresponding indices (i.e.) index, middle, ring & little finger of left/right hand. Geometrical and spatial properties have been used to identify these fingertips. The proposed algorithm can handle various challenges like dull prints, large rotational angles of the hand, Small variation in the fingertips, Non-elliptical shape of components.

The use of fingerprint in automatic personal identification is somehow limited due to many factors; Environment (which causes wet/dry prints) Cuts and bruises on fingertip. Sensor's condition (presence of dirt, latent print, etc.), Occupation or age (which manage smoothen the ridge-valley structure).To overcome these difficulties, there is a need to design an efficient latent fingerprint segmentation algorithm which satisfies the following constrains: Accurate: AH fingerprints in image are correctly located. Detecting hand' It can classify correctly whether the given image is of the right or the left band.

Finger labeling: Each segmented fingerprint image should correctly be recognized as one of these four fingers viz., index, middle, ring or little finger. Fingertip component is extracted by estimating the top most component from each finger. These are labeled from left to right by using hand geometry constraints and it uses local relationship between consecutive labeled fingertip components to determine hand type present in the fingerprint image. Also, it can effectively handle the problems of partial dull-prints and non-critical fingertip shaped components.

It makes the assumption that mean intensity value around knuckle line is low and fingerprint blocks have higher variance due lo ridge-valley structures as compared to blocks containing knuckle line. These measures may give spurious results for fingertip components containing dry/wet fingerprints, creases or dull prints., to find out whether two components, A and B, belong to a common finger or not, the shortest distance from center of one component to the line formed by the center and orientation of another component is used. This gives two distances and If the minimum of these two distances is within some acceptable range then these components are assumed to belong to a common linger. It has been observed that components from right hand (i.e. fore-ground) contain more local variation and information as compared to the background which is fairly isotropic in nature. Using this local information, each pixel is classified as foreground or background.

If the fingerprint is merged with any other pan of the finger in a fingertip component, then its area has low anisotropy due to halo effects. By using the algorithm proposed for fingerprint enhancement, such halo effects are removed because it uses coherence for measuring the anisotropy and fingerprint segmentation. Hence, merged components are separated and knuckle line is effectively detected. The enhancement technique also removes the areas which do not have uniform pattern The enhanced component image has sufficiently good ridge- valley structure; hence estimated orientation of a component is much more accurate- Each component is enhanced and Its edges are summed up across various search lines to extract the line shaped pattern. The local variation among these summed up edge pixels is used to define a cost function that gives the location of knuckle line. But this detection can be affected by creases or bad quality of fingertip components. Thus, this cost function is smoothened based on the domain knowledge and global behavior of the fingertip component. Dry finger in a component is the primary reason of wrong component detection. It results in inaccurate component detection as sometime areas belong to dry areas are marked as background during segmentation. This is often the case when a fixed threshold is applied for finalizing the latent image which has dry finger (low pixel intensities) in small area while some other areas have high intensities. Fingertip components are detected among these extracted components.

The core and delta are the two singular points present in fingerprints. The character which present in the human skin will cause a problem such as distortion and partial matching. The new method called minutiae based fingerprint matching method is used to match the minutiae present in both the reference and query. Finally it produces an equal score. Two features such as global and local were used in fingerprint recognition process. The information about the minutiae is the local feature of fingerprint. The secondary feature is the invariant character of the fingerprint. The global features of fingerprints are the type of singularities in fingerprints, number, and position of singularities, relationship of spatial and geometrical feature. The geometrical features are the lines, shape and size of ridges present in the fingerprints. Lastly a flow network method is used in this. In this method the secondary features such as minutiae was converted into query print. After that it calculates the final minutiae. In this, another two methods

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

were also used in this paper that is known as neural network and heuristic rule.

3.1 Segmentation and Filtering:

The image Processing is divided into three types,

- Low level image processing.
- Mid level image processing.
- High level image processing.

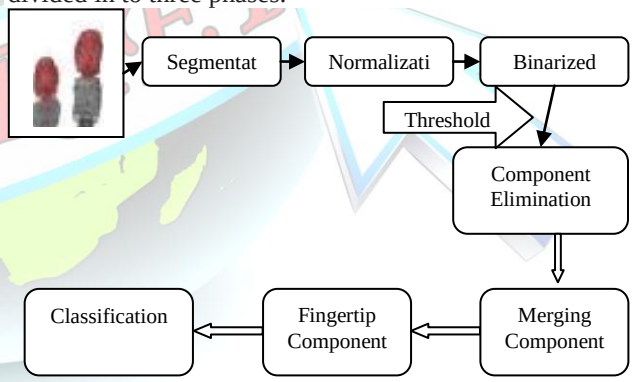
In low level image processing includes the removal of noise, sharpening the image and improving the contrast. The midlevel image processing includes segmentation process. The segmentation output is analyzed in high level image processing. The segmentation is a vital step in fingerprint identification system. The foreground and background are the two factors of fingerprint image. The foreground is extracted from the fingerprint by pressing the fingertip in the sensor. The background in fingerprint is the boundary of the image which contains noise. The segmentation is used to remove the features such as singular and minutia points. Due to heavy noise present in the image it produces a false character.

The segmentation process split the input image into small layer. In low level image processing the starting stage is segmentation it convert a color image into several images which contain the features in scene and object. The analysis in image processing is fully depends on the segmentation reliable. Its main drawback is it cannot separate the image accurately and it becomes a big issue.

In image processing two types of segmentation methods are used they are context a method and non-context method. In final stage of image processing it does not consider the characteristic in the images and it clusters the pixels on the source of the image features like color. The contextual method develops the contact of these images. For example it clusters the same color pixels and relative spatial position. The non-contextual threshold is a normal method which is used in non contextual method. In this, it convert the color image into a digital image and it represent as a region of binary map. It consists of two region of disjoints, first region constitute a small input pixel value than threshold. Another region has higher input pixel value than threshold. The previous and after regions is denoted as zero and non zero label. Depend upon the threshold value happened on property of image the segmentation was done.

The contextual type segment is used to separate each object. Based on the comparison of signals the contextual type segmentation is divided into similarity based and discontinuity based method. The discontinuity based method is used to detect the full margins. The Similarity based method is used to cluster the same region containing similar features. The similarity and discontinuity method entirely reverse process when compared to each other. In this entire boundary divides the one area into two or more. The image filtering is a technique used in image processing for several applications like noise removal, smoothing the image, sharpening the image and in detecting the edges. The filter is represented by kernel. The kernel is nothing but applying an array to every pixels of image and its nearby pixel in that same image.

The convolution is a method which is used to fix filters in an image. And the convolution is used in both spatial domain and frequency domain. In spatial domain, the initial stage of convolution is multiplied with the kernel components using the value of matched pixels. It has average output array. To perform the convolution in the input image a function called CONVOL is used. In the frequency domain method is multiplying the Fourier transform with the kernels fast Fourier transform. After the process is over the output convolution is again passed to the spatial domain method. To enlarge the image the size of the kernel is fixed with zero values. In frequency domain to perform the filtering action the functions like HANNING and IDL DIST was used. The fig 3.1 shows the design of the projected method is to examine the fingerprint. It is divided in to three phases.



In the first phase the components from the hand (i.e. fore-ground) contain more local variation and information us compared to the background which is fairly isotropic in nature. Using this local information, each pixel is classified as foreground or background. To detected components in to four classes (representing four fingers), geometrical properties of these components are analyzed center of mass mean and orientation centers of all components of a finger lie close to a line having local orientation of the finger. Principal component analysis can

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

be used to estimate local orientation. Local range of array is to find the difference between the maximum and the minimum value of an array lying in the interval.

In the second phase the "fingertip component" is extracted which lies at the top of the finger. These fingertip components contain fingerprint area. Each component is enhanced and its edges are summed up across various search lines to extract the line shaped pattern. Each segmented fingertip component is analyzed to figure out whether it contains any unwanted part of fingerprint. The image (Bid) with boundary pixels is projected to obtain the original image which is used to extract components from actual image considering the length of semi-major axis and semi-minor axis...

i) If value of threshold is lesser, then it refers that the fingertip component image contains unwanted areas.
ii) If value of threshold is large then the areas in fingertip component can be considered as fingerprint.

Since extracted fingertip components may contain other parts of the finger which do not belong to fingerprint. Location of the knuckle line for each extracted fingerprint component is used to define the desired fingertip component. Each component is enhanced and its edges are summed up across various search lines to extract the line shaped pattern. The local variation among these summed up edge pixels is used to define a cost function that gives the location of knuckle line. But this detection can be affected by creates or bad quality of fingertip components. Thus, this cost function is smoothened based on the domain knowledge and global behavior of the fingertip component.

In the third phase, all fingertip components consist of finger prints, it indexed into one of the four fingers such as index, middle, ring or little finger of left or right hand. Initially, these are numbered indicating left to right placement in a hand and then hand is detected using Relative length. Using numbering of these components and hand type, each fingerprint is labeled. It is observed that if the difference between lengths of the middle finger and index finger is less than that of the ring finger and little finger, then it can be inferred that image consists of right hand.

The modified fingertip components are labeled from left to right placements in a hand and based on this, hand present in the given image is predicted. There exists hand detection algorithms, for comparison, the fingerprint components extracted by the proposed algorithm after knuckle line detection is used. Only hand detection algorithms can be tested without affecting the slap segmentation accuracy. A spurious detection refers to a case of wrong hand detection. It can be interred from the proposed hand/fingerprint labeling algorithm gives better results than any other existing hand/ fingerprint labeling algorithm. The reason for the large number of spurious hand detection is mainly due to the use of spurious global orientation of hand. This makes the clustering of components into classes/linger more effective. An efficient knuckle line detection algorithm has been used to get rid of the areas that do not consist of fingerprint from a fingertip component.

It uses image enhancement to remove the effects of halo/sweat, dry finger or dull prints, if they are present in some part of the fingertip component. Also, to remove the effects of creases and bad quality, an polynomial approximation is applied on a cost function to remove local artifacts and to look for both local and global behavior. This makes the clustering of components into classes/finger more effective. An efficient knuckle line detection algorithm has been used to get rid of the areas that do not consist of fingerprint from a fingertip component. It uses image enhancement to remove the effects of halo/sweat, dry finger or dull prints, if they are present in some part of the fingertip component. Also, to remove the effects of creases and bad quality, a polynomial approximation is applied on a cost function to remove local artifacts and to look for both local and global behavior of the cost function. In addition for this, with the use of edges as features and radon transform, evaluation of the cost function is fast and accurate. Geometrical and spatial constraints of hand geometry are used to classify each fingerprint. Such a classification is robust because it uses the local orientation of two fingertip components along with their areas. Cases where spurious local orientation of one fingertip component can result in wrong hand detection are eliminated, of the cost function.

IV. Experimental Result

The FAR is the frequency that a non authorized person is accepted as authorized. Because a false acceptance can often lead to damages, FAR is generally a security relevant measure. FAR is a non-stationary statistical quantity which does not only show a personal correlation, it can even be determined for each individual biometric characteristic (called personal FAR). The FRR is the frequency that an authorized person is rejected access. FRR is generally thought of as a comfort criteria, because a false rejection is most of all annoying. FRR is a non stationary statistical quantity which does not only show a strong personal

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

correlation, it can even be determined for each individual biometric characteristic (called personal FRR).

The FER is the proportion of people who fail to be enrolled successfully. FER is a non-stationary statistical quantity which does not only show a strong personal correlation, it can even be determined for each individual biometric characteristic (called personal FER). Those who are enrolled yet but are mistakenly rejected after many verification/identification attempts count for the Failure. False Identification Rate (FIR) The False Identification Rate is the probability in an identification that the biometric features are falsely assigned to a reference. The exact definition depends on the assignment strategy; namely, after feature comparison, often more than one reference will exceed the decision threshold. Due to the statistical nature of the false rejection rate, a large number of verification attempts have to be undertaken to get statistical reliable results. The verification can be successful or unsuccessful. In determining the FRR, only fingerprints from successfully enrolled users are considered. The probability for lack of success (FRR(n)) for a certain person is measured

$$FRR(n) = \frac{\text{Number of rejected verification attempts for a qualified person (or feature) n}}{\text{Number of all verification attempts for a qualified person (or feature) n}}$$

These values are better with more independent attempts per person/feature. The overall FRR for N participants is defined as the average of FRR (n):

$$FRR = \frac{1}{N}\sum_{n=1}^{N} FRR(n)$$

The values are more accurate with higher numbers of participants (N). Alternatively, the median value may be calculated. Important: the determined FRR includes both poor picture quality and other rejection reasons such as finger position, rotation, etc. in the reasons for rejection. In many systems, however, rejections due to bad quality are generally independent of the threshold. The FRR after quality filtering is similarly defined:

$$\frac{\text{Number of rejected "qualified" attempts}}{\text{Total number of "qualified" attempts}}$$

An FRR defined as such, generally yields better data sheet values, but these lower numbers are not reflected in reality from a user's perspective. Finally, the result of a verification attempt has to be defined exactly: A verification attempt is successful if the user interface of the application provides a "successful" message or if the desired access is granted. A verification attempt counts as rejected if the user interface of the application provides an "unsuccessful" message. In cases of no reaction, a verification time interval has to be given to ensure comparability. If the time interval has expired the verification attempt is counted unsuccessful.

Due to the statistical nature of the false acceptance rate, a large number of fraud attempts have to be undertaken to get statistical reliable results. The fraud trial can be successful or unsuccessful. The probability for success (FAR (n)) against a certain enroled person n is measured:

$$FAR(n) = \frac{\text{Number of successful independent fraud attempts against a person (or characteristic) n}}{\text{Number of all independent fraud attempts against a person (or characteristic) n}}$$

These values are more reliable with more independent attempts per person/characteristic. In this context, independency means that all fraud attempts have to be performed with different persons or characteristics! The overall FAR for N participants is defined as the average of all FAR(n):

$$FAR = \frac{1}{N}\sum_{n=1}^{N} FAR(n)$$

The values are more accurate with higher numbers of different participants/characteristics (N). Alternatively, the median value may be calculated. The crucial number for the determination of statistic significance is the number of independent attempts. Obviously, two attempts in which alternately one person is the reference and another places the request, are not independent of each other. Likewise, multiple attempts from one unauthorized user are considered dependent and therefore have less meaning for statistical significance. During FAR determination, a fraud attempt is an attack using the characteristics of non authorized persons. This, however, pretends a high security which may not be present since there are a lot of further possibilities for promising attacks. A fraud attempt is successful if the user interface of the application provides a successful message or

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

if the desired access is granted. A fraud attempt counts as rejected if the user interface of the application provides an unsuccessful message. In cases where no unsuccessful message is available, a verification time interval has to be given to ensure comparability. If the verification time interval has expired the fraud attempt is counted unsuccessful.

The similarity degrees of all matched trivia and unmatched square measure computed for latent fingerprint image. If the similarity degree between a try of finer points is above or adequate to a threshold, they're inferred as a try of matched minutiae; otherwise, they're inferred as a try of unmatched finer points. Once the similarity degree between a try of the latent fingerprint image unmatched finer points is above or adequate to a threshold and inferred as a try of matched finer points, a blunder known as false match happens. Once the similarity degree between a try of matched finer points is less than a threshold and inferred as a try of unmatched finer points, a blunder known as false non-match happens. The proposed result is compared with the existing method. It is given in table 4.1

Method	Matched	Unmached
Houghman	54%	46%
Ridge Clarity Map	69%	31%
Local and Global Matching	74%	26%
Proposed	90%	10%

Table 4.1 Comparative Table

V. SUMMARY AND CONCLUSION

The proposed algorithmic rule used to be established victimization altered fingerprints synthesized in methods that by and large found out in operational circumstances and a bit variety of obtainable real altered fingerprints. It have not yet concept-a few imperative clue for detection altered fingerprints, namely scars, which ordinarily appear on the cuts on finger dermis. It's currently functioning on combining orientation area and scar information to extra beef up the detection cost of altered fingerprints. This algorithmic program outperforms the industrial intermediator VeriFinger over all qualities of latents in government agency SD27. The advance within the rank-1 accuracy of the projected algorithmic program over finger varies from a pair of 3% for latents with comparatively sizable amount of trivialities to as high as twenty second for latents with the subjective quality as bad. These results show that our intermediator is a lot of appropriate for latent fingerprints. The projected alignment technique performs all right even on latents that contain tiny range of trivialities. During this algorithmic program it take the utmost score from many hypothesized alignments supported completely different alignment parameters. Sometimes, the utmost score doesn't correspond to the right alignment. Here conceive to improve the score computation by applying learning strategies. Extended options manually marked by latent examiners are shown to be useful for up latent matching accuracy. The future work can be extended to apply ganssianization, the feature normalization method on the high resolution images where multiple features can be extracted the patterns of ridges and valleys on the surface of the fingertip. It is one of the most extensively studied biometric traits and is considered as a proof of evidence in courts of law or in forensics because it exhibits all necessary characteristics such as uniqueness, permanence and difficult to forge. For slap-image based personal authentication, fingerprint of each finger is segmented from the slap-image and features which are used for authentication are extracted from each of these fingerprint. Extraction of all fingerprint images from slap-image is termed as slap fingerprint segmentation.

REFERENCE

[1]. krystian Mikolajczyk and cordelia schmid, "*A Performance Evaluation Of Local Descriptors*" IEEE Transactions on Pattern Analysis and Machine Intelligence Volume 27 Issue 10, October 2005

[2]. Xinjian Chen, Jie Tian, Xin Yang, "*A New Algorithm for Distorted Fingerprints Matching Based on Normalized Fuzzy Similarity Measure*", IEEE transaction on Image processing, Vol. 15, No. 3, June 2006

[3]. Tsai-Yang Jea, Venu Govindaraju, "*A Minutia-based Partial Fingerprint Recognition System.*", Pattern Recognition, Vol.38, N0. 10, October 2005.

[4]. Marius Tiko, pauli kousmanen, "*Fingerprint Matching Using An Orientation-based Minutiae Descriptor*.", IEEE Transactions on Pattern Analysis and Machine Intelligence Volume 25 Issue 8, October 2003.

[5]. Sharath Pankanti, Salil Prabhakar, Anil k. Jain, "On the Individuality of Fingerprints.", IEEE Transactions on Pattern Analysis and Machine Intelligence Volume 24 Issue 8, August 2002.

[6]. Jie Zhou, Member, IEEE, and Jinwei Gu, "*A Model-Based Method for the Computation of Fingerprints Orientation Field*" IEEE transaction on Image processing, Vol. 13, No. 6., June 2014

[7]. Asker M. Bazen and Sabih H. Gerez, "*Systematic Methods for the Computation of the Directional Fields and Singular Points of*

ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 3, Issue 6, June 2016

Fingerprints" IEEE transaction on Pattern Analysis and Machine Intelligence, Vol. 24, No. 7, July 2002

[8]. Kenneth Nilsson and Josef Bigun, "*Complex Filters Applied to Fingerprint Images Detecting Prominent Symmetry Points Used for Alignment*" Springer, LNCS 2359, pg. 39 – 47, 2012

[9]. Kenneth Nilsson and Josef Bigun, "*Localization of corresponding points in fingerprints by complex filtering*" IEEE Transactions on Pattern Analysis and Machine Intelligence, 2012.

[10]. Sharat Chikkerur, Nalini Ratha, "*Impact of Singular Point Detection on Fingerprint Matching Performance*" IEEE Workshop on Automatic Identification Advanced Technologies, October 2009.

[11]. F.A. Afsar, M. Arif and M. Hussain, "*Fingerprint Identification and Verification System using Minutiae Matching*", National Conference on Emerging Technologies, 2004.

[12]. Puneet Gupta n, PhalguniGupta, "*An efficient slap fingerprintsegmentationandhand classification algorithm"*, Neurocomputing142(2014)464–477, 2014.

[13]. Soweon Yoon, Student Member, IEEE, Jianjiang Feng, Member, IEEE, and Anil K. Jain, Fellow, IEEE," *Altered Fingerprints: Analysis and Detection*" IEEE Transactions on Pattern Analysis And Machine Intelligence, Vol. 34, No. 2, March 2012.

[14]. Harold Cummins, "*Attempts To Alter And Obliterate Finger-Prints*" Volume 25,Issue 6 March-April , Article 12,"Journal of Criminal Law and Criminology"

[15]. Jianjiang Feng, Anil.K. Jain, and A. Ross, "Detecting Altered Fingerprints," Proc. 20th International Conference. Pattern Recognition, pp. 1622-1625, Aug. 2010.

[16]. Soweon Yoon, Eryun Liu, and Anil K. Jain" On Latent Fingerprint Image Quality", 5th International workshop on computational Forensics, Tsukuba, Japan, Nov11, 2012.

[17]. A. Antonelli, R. Cappelli, D. Maio and D. Maltoni, "Fake Finger Detection by skin Distortion Analysis", *IEEE Trans. Information Forensics and Security*, Vol. 1, no.3, pp.360-373, Sept.2006.

[18]. K.A. Nixon and R.K. Rowe, "Multispectral fingerprint imaging for spoof detection", *proc. SPIE, Biometric Technology for human identification II, A.K. Jain and N.K. Ratha*, eds., pp.214-225, 2005.

[19]. J. Feng, A.K. Jain, and A. Ross, "*Detecting Altered Fingerprints*," Proc. 20th Int'l Conf. Pattern Recognition, pp. 1622-1625, Aug. 2010