

A Survey on Fingerprint Identification For different Orientation Images.

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Abstract - Most of system uses Biometric to identify persons .So one can use any feature such as it may be face, fingerprint ,hand retina etc. In this paper we focus on fingerprint recognition. Input image is scanned and then pre-process to extract feature using different algorithm. In this way by using fingerprint as input image we process on this image and find out the person is authorized or not.

Key Words: Fingerprint, DWT, Gabor filter, DTCWT, BPNN, fingerprint matching

1.INTRODUCTION

Now a days it is necessary to identify authorized person. For that purpose most of systems uses Biometric to find valid persons. User can use traditional methods such as using PINs ,password, token, but these methods are not much secure. The password or PINs are access by other person or it can be misplaced so there will be misuse of this data so instead of that we can use biometric system for more secure in online shopping or in other area such as ATMs etc.

The biometric system (bio means life and metric means measure) based on feature vector. These vectors are derived from behavioral characteristics or physiological. Biometric system uses Behavioral characteristics of Person such as hand scan, fingerprint, face scan, Retina scan. Biometrics deals with automatic recognition of persons based on their behavioral characteristics and physiological. Biometrics are more reliable as compared to traditional methods. Out of these behavioral characteristics here we use fingerprint to identify persons. Each person has unique fingerprint for twins also. Input image may be any type i.e. inked image, scan image , etc. Fingerprint have graphical patterns such as ridges and valleys, and minutia points. A fingerprint composed of a sequence of ridges and valleys which are parallel to each other. The dark lines are ridges and light areas between ridges are the valleys.

There are number of techniques are available to extract feature out of that minutia based method is

popular one. It uses feature vector means extract feature from database for different orientation and extract feature from input image also and then matching algorithm is used here to match images. Basically fingerprint authentication is used to match two fingerprint images. There are three basic steps to recognize persons preprocessing, feature extraction, matching.

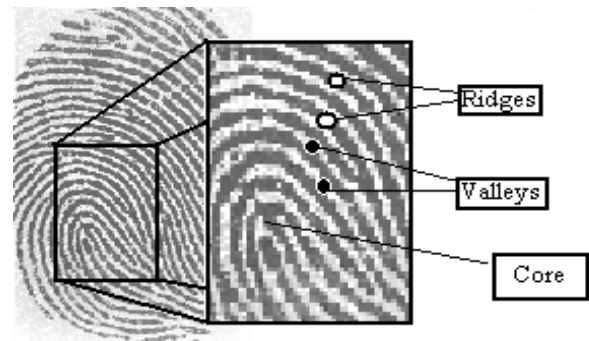


Fig. Fingerprint with core, valleys, ridges

On the inner most ridge core is defined. The different fingerprint images are described below.



a) Live-scan fingerprint

b) Inked fingerprint on paper



c) fingerprint from NRC

2. REVIEW OF LITERATURE

2.1 Alessandra A. Paulino & Anil K. Jain ,“Latent Fingerprint Matching Using Descriptor-Based Hough Transform ” IEEE transactions on information forensics and security, vol. 8, no. 1, january 2013

This paper uses noise characteristics and a small number of minutiae of latent to their full prints which are stored in database. In this paper work is done on latent fingerprint. It uses Hough transform method to find similarity between two fingerprints. It considers both orientation as well as minutiae. But it has less accuracy when there is overlap between the latent and rolled prints is small.

2.2 K.Thaiyalnayaki, S. Syed Abdul Karim, P. Varsha Parmar “Finger Print Recognition using Discrete Wavelet Transform ” in ©2010 International Journal of Computer Applications (0975 - 8887) Volume 1 – No. 24

In this paper DWT is used for analyzing the fingerprints. Input image is preprocessed to remove noise and then DWT is applied to extract features. Here Canberra distance metric is used for similarity comparison between the texture classes. But it is observed that it can not analyze low resolution fingerprint images and images with dark background.

2.3 Amit Kaul ,A.S. Arora & Sushil Chauhan “Rotation Invariant Fingerprint Core-Point Detection using DWT” International Conference on Recent Advances and Future Trends in Information Technology (iRAFIT2012) Proceedings published in International Journal of Computer Applications® (IJCA)

In this paper, to handle rotational variance DWT is used here which is based on core-point detection. To locate the core this paper uses 2D-wavelet coefficients in horizontal, vertical and diagonal direction. And it gives result for different database with different orientation. This paper uses Wavelet Transform. But the drawback of this method it is not applicable for larger database and development of rotation invariant.

2.4 Ju Cheng Yang and Dong Sun Park “Fingerprint Verification Based on Invariant Moment Features and Nonlinear BPNN ” International Journal of Control, Automation, and Systems, vol. 6,no. 6, pp. 800-808, December 2008.

This paper uses set of invariant moment features and a nonlinear Back Propagation Neural Network (BPNN) verifier. This paper overcomes the drawback of traditional methods. It has two stages off line and on line stage. On line stage is used for testing input image, and off line stage is used for template processing. This paper uses neural network, BPNN, invariant moment features. The result of this system gives higher accuracy and higher matching speed.

2.5 Jossy P. George, Abhilashs. K., Chethana M. D. and Raja K. B. “Performance Analysis of Fingerprint Identification Using Different Levels of DTCWT ” 2012 International Conference on Information and Computer Applications (ICICA 2012) IPCSIT vol. 24 (2012) © (2012) IACSIT Press, Singapore.

In this paper different level of DTCWT are used for analysis of fingerprint for identification. In this proposed system input image is cropped and resized to apply DTCWT. By applying DTCWT on input fingerprint we will get coefficient to form features. To obtain two parts of the images, i.e., real and imaginary part DTCWT generates complex coefficients by using a dual tree of wavelet filters. Different levels of DTCWT are used here out of that level 7 has good recognition rate.

2.6 Zin Mar Win and Myint Myint Sein “Robust Fingerprint Recognition System using Orientation and Texture features ” 2nd International Conference on Computer Science and Information Technology (ICCSIT'2012) Singapore April 28-29, 2012

This paper prefers Gabor filter to capture local and global texture data from poor images as well as incomplete images. By combining orientation features and the local texture pattern obtained using a bank of Gabor filters a hybrid fingerprint matching algorithm is developed. Here Gabor filter is used to extract orientation information and unique frequency information. So input image is filtered using the set of Gabor filters. According to experimental results, this method gives improved accuracy of recognition system and it is robust to image distortion and image rotation. This algorithm is effective and efficient for rotated images and low quality.

3. CONCLUSIONS

Papers discussed above provide various methods for detection of orientation based fingerprint recognition. Above paper gives a number of methods to extract the feature and matching algorithms. Each method have it's own advantages and drawback also. According to application We can select any one of them or combination of them for best result.

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