A Survey on Fingerprint Identification For different Orientation Images.

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Abstract - Most of systems 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 fingerprint. In this work, a latent fingerprint is considered as a point of origin. However, it has less accuracy when there is overlap between the latent and rolled prints.


In this paper, DWT is used for analyzing the fingerprint images. The 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 cannot analyze low-resolution fingerprint images and images with dark background.


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


This paper uses a set of invariant moment features and a nonlinear Back Propagation Neural Network (BPNN) verifier. This paper overcomes drawbacks of traditional methods. It has two stages: offline and online. In the offline stage, it is used for testing input images, and in the online stage, it is used for template processing. This paper uses neural network, BPNN, and invariant moment features. The result of this system gives higher accuracy and higher matching speed.


In this paper, different levels of DTCWT are used for analysis of fingerprint identification. In this paper, the input image is cropped and resized to apply DTCWT. By applying DTCWT on input fingerprint, we get a coefficient to form features. To obtain two parts of the images, i.e., real and imaginary parts, 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 a good recognition rate.


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 Gabor filter, 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 and 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.

REFERENCES


