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A Review of Fingerprint Recognition by Minutiae's Analysis

Umesh Singh Tomar, Abhinav Vidwans

CSE Dept., VITM Gwalior, India

***Abstract*:** *Fingerprint analysis is the most essential part of human identification or human recognition. At present too many biometric techniques are presented for fingerprint identification and fingerprint recognition. We know that, a fingerprint contains a lot of key point like Y shape, delta, ridge ending, ridge staring, minutiae's pattern and etc. All points are apodictic of unique for any human fingerprint. This paper defines the various sophisticated method of fingerprint like segmentation, FFT and Gabor Filters.*

Keywords: FFT, biometrics, fingerprint, bifurcation, Segmentation, Gauss Filtering, Histogram.

1. INTRODUCTION

Fingerprint is the primary part of biometrics; it is easy to understand compare to another existing biometric trait like face, voice [2]. So it's produced very high recognition rate for human recognition. We know that, fingerprint is one of the most important researched and developed fields of biometric authentication. The first example of biometrics is that it was a form of fingerprinting that being used in China [3]. It is true; a fingerprint is mostly incomparably and truly unchanging form of all other forms of human signature [4].

Figure1 Fingerprint image

A fingerprint is defined by a set of minutiae point's for example ridge lines and they run parallel and sometimes starting , terminates, sometimes intersects and move with one direction or opposite direction. Here all points are known as Minutiae point [5]. A fingerprint contains 20 to 80 minutiae points that mean, it is good fingerprint [6] and also depends on the sensor resolution quality. However the fingerprint image captured by poor scanners, are gated to have very less number of minutiae points.

We know that emotional states of face make a class of face which store more than one face image. Now days such types of application are use as research for human interaction with computer like for medical diagnosis, for awareness systems, for animation and etc.

All most of the previous works have facial expression data that were collected by querying to pose facial expressions.

As an average, a promising with definite solution, expression analysis from image has received much attention in the last two decades [1], [2], [3].

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2. WHAT IS FINGERPRINT

A fingerprint contained many types of minutiae's such as ridge ending, bifurcation, arch, twin loop, whorl, right loop, left loop, short ridge, spur, core, delta, island etc.

Figure2 Minutiae points

3. LITERATURE REVIEW

In the field of fingerprint recognition, too many types of work have been done. We had gone through various research papers on fingerprint identification and fingerprint recognition, the work done till today and different the methods used in each work are given below.

1. *Segmentation Algorithm*

The first and most integral pre-processing steps for any fingerprint verification is Segmentation, and it is also calculate the result of fingerprint analysis and recognition. Today many segmentation algorithms have been presented which are described as given below:

a. *Gauss Filtering*

Noises are usually come into the fingerprint image for many reasons. Therefore, the Gaussian filter is used to remove this effect and well improve the quality of the fingerprint images.

b. *Histogram Processing*

The underlying fingerprint image enhancement is done by Histogram mostly. Histograms are very simple to determine pixel values and position value in MATLAB software.

2. Fast Fourier Transform (FFT) and Gabor Filters

FFT and Gabor are used to enhance and reconstruct the quality of the fingerprint image. Also it is extracted two types of minutiae, bifurcations and ending points.

4. METHODOLOGY OF RECOGNITION PROCESS

The main objective of the fingerprint recognition is found the similarity or difference of given fingerprint images by using the minutiae's points. The basic block diagram is clearly referred in a figure 3 given below.

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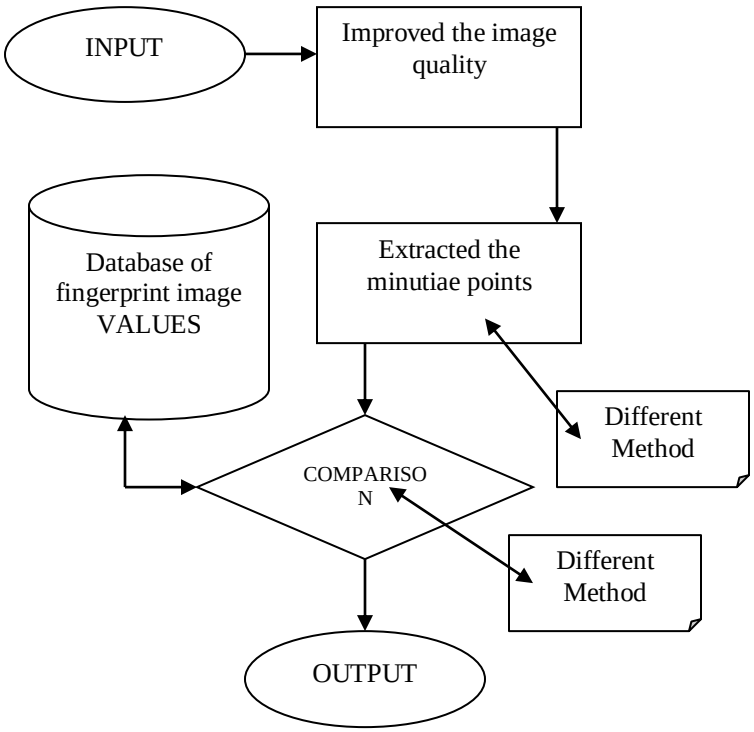

Figure 3 Flowchart of fingerprint recognition

It consists of three components such as extraction block, database block and comparison block, which are shown with the help of a flowchart to recognize fingerprint image. Here we are explained too many different methods of comparison block.

5. CONCLUSION

In this paper, we have described different-2 techniques which can be used to recognize a person by its fingerprint image. These methods conclude that the fingerprint is very fast and more accurate for more trusty and safety system. The Gabor filter method is a very useful method because it is easy to implement for feature extraction. The methodology of the biometric identification system is represented in figure 3 with the help of flow charts which can be used to enhance the quality of the image in first step of flowchart, that is verify the identity of a person. In Future research work can be carried out to improve the recognition rate by neural network with fuzzy system.

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