FINGERPRINT RECOGNITION BASED ON MINUTIAE EXTRACTION PRINCIPLE

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Abstract:

Fingerprint recognition refer to the automated method of verifying a match fingerprint with a large database. Fingerprints are one of many forms of biometrics used to identify individuals and verify their identity. In this paper we create a methodology for fingerprint recognition. It is holding all possible fingerprint minutia ridges. We know that an ridges enter from one side of the finger, rise in the center forming an arc, and then exit the other side of the finger. The loop is a pattern where the ridges enter from one side of a finger to exit from the same side they enter.

By this method, we improve the recognition result with database, after this we calculate the matching score of most similar fingerprint images.

Keywords: Image processing, Minutia analysis, Ridge analysis.

I. INTRODUCTION

A fingerprint is the feature pattern of one finger. It is believed with strong evidences that each fingerprint is unique. Each person has his own fingerprints with the permanent uniqueness. So fingerprints have being used for identification and forensic investigation for a long time. A fingerprint is composed of many ridges and furrows. These ridges and furrows present good similarities in each small local window, like parallelism and average width.

However, shown by intensive research on fingerprint recognition, fingerprints are not distinguished by their ridges and furrows, but by Minutia, which are some abnormal points on the ridges. Among the variety of minutia types reported in literatures, two are mostly significant and in heavy usage: one is called termination, which is the immediate ending of a ridge; the other is called bifurcation, which is the point on the ridge from which two branches derive.

The fingerprint recognition problem can be grouped into two sub-domains: one is fingerprint verification and the other is fingerprint identification. Fingerprint verification is to verify the authenticity of one person by his fingerprint. The user provides his fingerprint together with his identity information like his ID number. The fingerprint verification system retrieves the fingerprint template according to the ID number and matches the template with the real-time acquired fingerprint from the user. Usually it is the underlying design principle of AFAS (Automatic Fingerprint Authentication System).

Fingerprint identification is to specify one person's identity by his fingerprint. Without knowledge of the person's identity, the fingerprint identification system tries to match his fingerprint with those in the whole fingerprint database. It is especially useful for criminal investigation cases. And it is the design principle of AFIS (Automatic Fingerprint Identification System).

II. FINGERPRINT RECOGNITION

Minutiae based matching:-

Minutia-based algorithms extract information such as ridge ending, bifurcation, and short ridge from a fingerprint image.
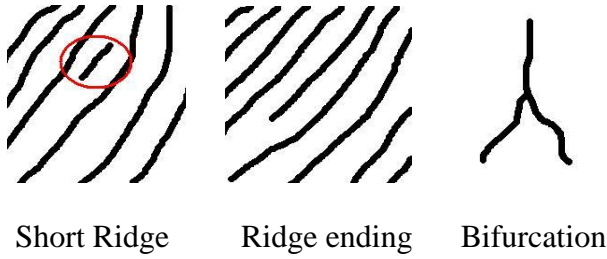
Short Ridge   Ridge ending   Bifurcation

Fig. 1

These features are then stored as mathematical templates. The identification or verification process compares the template of the image with a database of enrolled templates and showed the matching result.

III. PROPOSED WORK

Method Description:

My work is based on minutia points of fingerprint recognition techniques. It is very effective method because it have the three most recognition technique.

Flowchart of the methodology

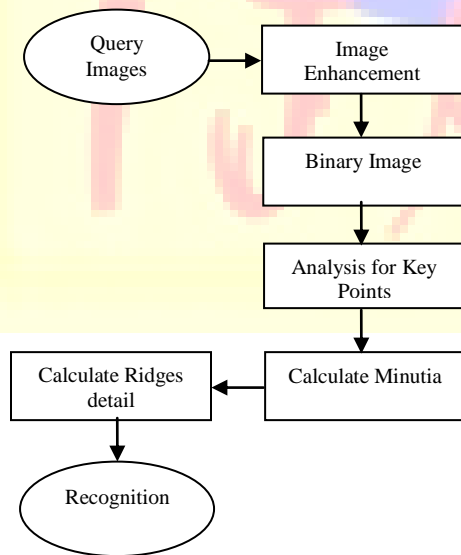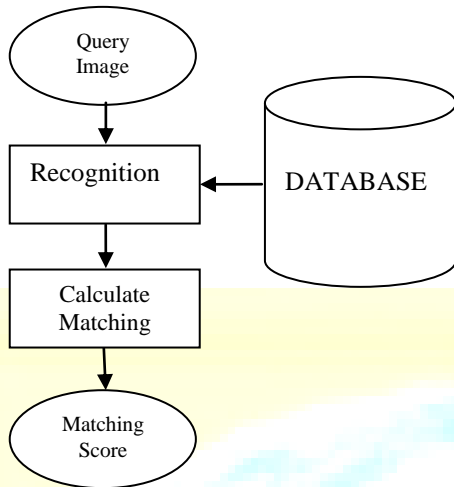Fig.2

Fig.3

IV. EXPERIMENTAL RESULTS

We determine the recognition of the image and after recognition we will performed the matching task. Above both Figure show the recognition procedure of the image and also recognition procedure apply on database image then after we determine the most similar image from the database with matching score.

Fig.4

Here, show the some fingerprint images A,B,C D,E and F.

Images	Minutia Points	Matching Scre(%)
A	17	38
B	23	61
C	14	50
D	19	100
E	26	78
F	21	69

Table 1

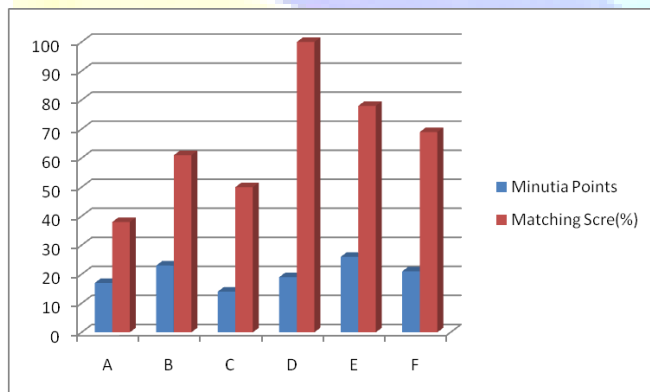Table 1 Show the fingerprint image details.

Fig.5

V. CONCLUSION AND FUTURE WORK

In this paper, we have developed a corresponding minutiae pairings based recognition methodology that is very effective and efficient because it reduce the deficiency of existing methods like minutia, ridge and correlation. In future we add some other concept like 2D cross correlation, shape descriptor and moment invariants.

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