Design a MNUR method for Finding Similarity between Fingerprint Images Based on Fingerprint Detection Technique -1

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Abstract: **Fingerprints are the most widely used for person identification and verification in the field of biometric system. We know that the fingerprints detection possess is mainly three types those are used in automatic fingerprint identification and verification: (i) Minutia (ii) Ridge and (iii) correlation.**

In this paper we create a method that based on minutia and ridge technique. Firs we find out the all minutia point of the fingerprint image then after calculate the ridge information of all minutia point like starting point of the ridge, ending position of the ridge, number of pixels on the ridge etc By this method, we improve the comparison between one-to-one fingerprint image matching and also find the pattern similarity between query fingerprint image and database images. It is very useful to overcome the problem of finding number of criminal in the crime.

Keywords: **Image processing, Minutia analysis, Ridge analysis, Pixel orientation, Edges, Canny operator.**

I.   INTRODUCTION

Fingerprint is one of the most important in biometric traits and legitimate proof of evidence in courts of law all over worldwide. Fingerprints are used in forensic divisions worldwide for criminal investigations[1]. More recently, an increasing number of civilian and commercial applications are either using or actively considering using fingerprint-based identification because of a better understanding of fingerprints as well as demonstrated matching performance than any other existing biometric approach. Modern fingerprint matching techniques were initiated in the late 16th century. Henry Fauld, in 1880, first scientifically suggested the individuality and uniqueness of fingerprints[2]. At the same time, Herschel asserted that he had practiced fingerprint identification for about 20 years. This discovery established the foundation of modern fingerprint identification. In the late 19th century, Sir Francis Galton conducted an extensive study of fingerprints. He introduced the minutiae features for single fingerprint classification in 1888. The discovery of uniqueness of fingerprints caused an immediate decline in the prevalent use of anthropometric methods of identification and led to the adoption of fingerprints as a more efficient method of identification.

II.   FINGERPRINT MATCHING

Minutiae and Ridge based matching:- Minutiae are extracted from the two fingerprints and stored as sets of points in the two- dimensional plane and matching essentially consists of finding the alignment between the template and the input minutiae sets that results in the maximum number of minutiae pairings. We know that ridges are part of minutia feature[3].

Minutia and Ridge:- Minutiae[4,5] are major features of a fingerprint, using which comparisons of one print with another can be made.

Ridge ending - The abrupt end of a ridge.
Ridge bifurcation - A single ridge that divides into two ridges.
Short ridge, or independent ridge - A ridge that commences, travels a   short distance and then ends.
Island - A single small ridge inside a short ridge or ridge ending that is not connected to all other ridges.
Ridge enclosure - A single ridge that bifurcates and reunites shortly afterward to continue as a single ridge.
Crossover or bridge - A short ridge that runs between two parallel ridges.
Delta - a Y-shaped ridge meeting.
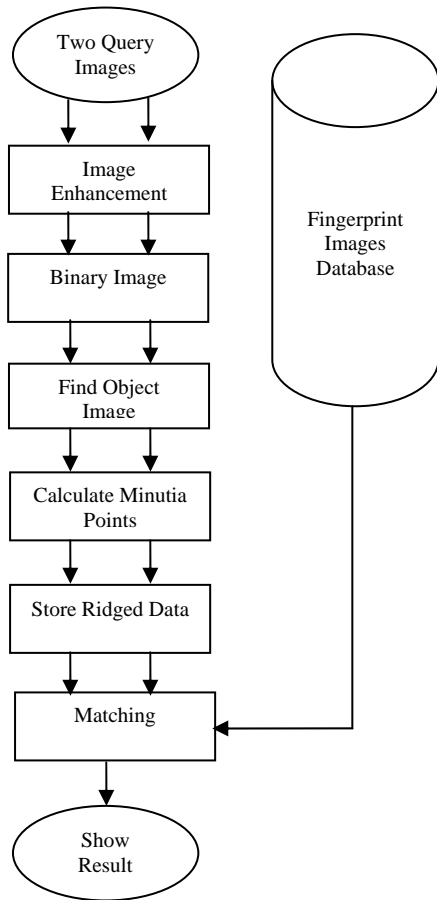*Core* - a U-turn in the ridge pattern.

III.   PROPOSED WORK

Method Description

My proposed work is combination of two most fingerprint matching techniques. It is very useful method to find matching score in two fingerprint images and find the similar image from the database.

Flowchart of the methodology

Algorithm of the methodology

Step1). Get two query images by user.

Step2). Apply morphological operations for removing noise and small objects from fingerprint images.

Step3). After step2 we improve the image intensity for better analysis.

Step4). Now we apply a threshold value by graythresh function for binary image.

Step5). In this step we will getting some information about fingerprint image.

   (a) Calculate all minutia points.
   (b) Calculate the total number of Ridge ending and Ridge bifurcation.
   (c) Calculate the total number of Y- shape Ridge.
   (d) Determine the pixels value of the image with position.

   (e) Compute the correlation between two corresponding images pixel.

Step6). After getting the above data we will finding the similarity matching score between images and also calculate the similarity matching between query fingerprint image and database images.

Step7). Show the result.

IV. EXPERIMENTAL RESULTS

We determine the matching score on the some fingerprint images is given in table 1 below.

Fig. 1

Here, show the some fingerprint images like a,b,c,d,e and f in figure1.
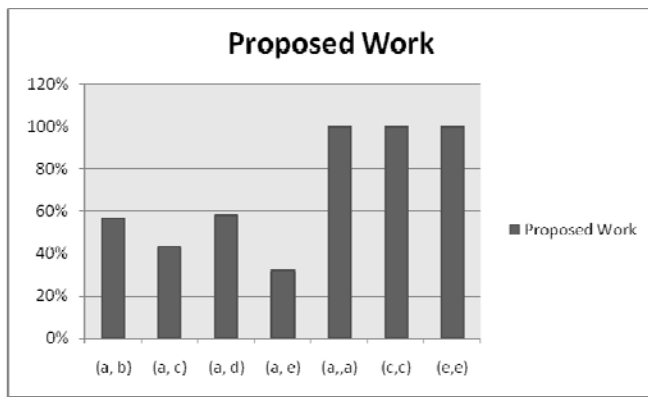
Images	Proposed Work
(a, b)	57%
(a, c)	43%
(a, d)	58%
(a, e)	32%
(a,,a)	100%
(c,c)	100%
(e,e)	100%

Table 1

Table 1 show the matching score between two fingerprint images pair by proposed work.

V. CONCLUSION AND FUTURE WORK

In this paper, we have developed a method that is very effectively work on fingerprint images. It selects a pair of two fingerprint images then find the matching score between them. It reduce the deficiency of existing methods like minutia, ridge and correlation. This proposed method gives better result than all the other individual method. In future we add some other concept like 2D cross correlation, shape descriptor and moment invariants with this approach and get a very good result for fingerprint matching.

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