

Criminal Background Record Verify System With Fingerprint Images

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Abstract: Fingerprint recognition is one of the most widely used methods of biometrics. This method relies on the surface topography of a finger and, thus, is potentially vulnerable for spoofing by artificial dummies with embedded fingerprints. In this study, we applied the fingerprint recognition technique to check criminal background of person. Our system working with two parallel process that are fingerprint recognition and matching with personal profile in database. We also demonstrated that an evaluated the experimental with two types that are match and not match to any profile in database which can used in automatic recognition systems. The efficiency of our system is excellent.

Keywords: Fingerprint, Check, Background, Criminal.

1 Introduction

Personal identification there are many ways to verify and prove. Whether prove by ID card or official document are issue by government, such as a fingerprint, signature, etc. The government is more important to identify who person and will be complicated and costly. The tools or equipment belong to government is not up to date and low technology.

Fingerprints are another way to identify [1] a person and are not complicated, not need to by document, Even though the fingerprint reader tools is not expensive but cannot be read or process by itself and not to have other device to process shut as computer. The Fingerprint Imaging Program for personality identification [2] is a concept to minimize the work process and easy to use and user friendly. The Personality identification process can be made easier and more convenient by using Minutiae matching.

2 Related Literature

2.1 Fingerprints

Fingerprints Feature and specifications. The Fingerprints are often used to identify or prove to be the same person. The Fingerprints is the most reliable way and unique but there is little change depend on age. [3] Fingerprints consist of two types of stripes. The first called "Ridge" caused by the embossed surface from the outer skin. And another type called "Groove or Valley" is a depth that is lower than the level of the convex. So you will see that the skin on the finger will have a higher line and another line deep. The convex lines and grooves are alternate. [3]



Fig. 1. Groove and the bulge of the finger.

Fingerprints can be classified into four patterns: Arch, Ulnar Loop, Whorl by have detail as:

1. Arch patterns: This is a special pattern and unique. It only 5% of person for Arch pattern and can be define; 1) simple arch, 2) tented arch.



(a) (b)
Fig. 2. Arch patterns (a) simple arch, (b) tented arch.

2. Loop patterns: This pattern is most common of fingerprints and can be founded 60-65% and can be define as 1) ulnar loop, 2) radial loop.



(a) (b)
Fig. 3. Loop patterns (a) ulnar loop and (b) radial loop.

3. Whorl pattern is a fingerprint with a circular line around the middle, similar to a spiral. The person with this fingerprint pattern is about 30-35% and can be define concentric whorl and whorl spiral.

4. Mixed Fingerprints is a special fingerprint and cannot be matched to any the three types mentioned above, but may consist of two fingerprints mixed and more than two shoals or more [4].

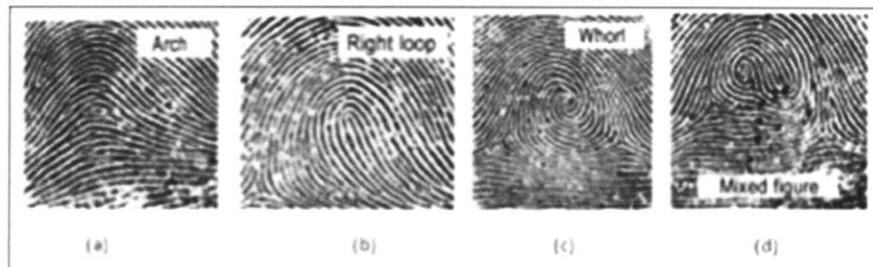


Fig. 4. Fingerprint Patterns (a) Arch (b) Right Loop (c) Whorl (d) Mixed figure.

2.2 Matching the Fingerprint

Fingerprint Matching Methods are fingerprint or finger scan techniques that compare the registered fingerprint templates. With fingerprints being scanned as fingerprint matching, the techniques commonly used in finger scanners present two types of matching: miniature matching and pattern matching [5].

2.2.1 Miniature Matching

This method uses the principle that each one of us fingerprints. The line form is often referred to as the junior point. Bifurcation is the point where the line separates and the endings are the places where the line ends. In the finger recording process for registration. Miniature point are generated in the form of positions relate to each other both of position and direction. This will be recorded as a reference value and converted to digital data stored as a template. This will be recorded as a reference value and converted to digital data stored as a template.

This data is stored as the value of the underlying fingerprint. To be used to monitor the person when there is comparison of usage Miniature matching occurs when a finger scan of a fingerprint user is performed. Of users who have been added. It will undergo a mini checkout process as well as a master fingerprint image.

The reference points that have been separated as the junctions are converted to digital data and will be compared the level of similarity to the underlying image. It was recorded at the time of registration.

By trying to compare points. As much as possible in value definitely defined. This value will determine the comparative results obtained. It must be close to how well it will match as a junior as shown in Figure 5. [6]

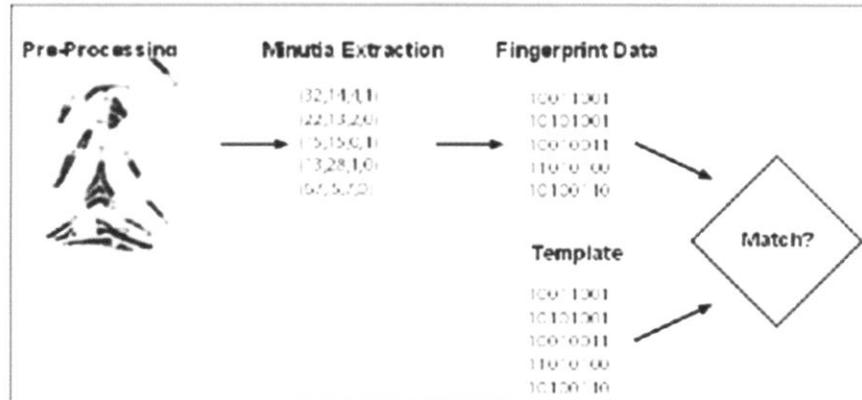


Fig.5. Minutiae matching process.

2.2.2 Pattern Matching

One unique feature of algorithm the pattern is the effect of all fingerprints. Counted not only for specific fingerprint effects. Like a mini match. Include sub areas, this includes the thickness, the curvature, and density of the lines [7],[8]. The reason of these is the complexity of the algorithm. The database model is independent of the size of the fingerprint sensor and does not depend on the capacity.

Minutiae in fingerprints.

To the extent of the way the Minuses. It will be damaged by the difficulty of finger recognition with variable fingerprints. But for matching algebraic the format is not. So The graphics that come from the capture device to distinguish it from those stored in the database. The operation of the program to determine fingerprints and centering, which may not be the center of gravity from middle finger

After that, the image is cut at a fixed distance around the center of the image. It is a rectangle, after which the cut area is compressed and stored for later pairing. The proof process starts with a fingerprint image of the user. After that, the prototype image recorded at registration will be compared to the scanned fingerprint image. To determine the difference with the underlying image, a Verification Threshold value is used, which describes the minimum permissible deviation that is used to determine the fingerprint. Match the same as the one stored as shown in Fig 6 shown a fingerprint pattern matching.