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# Feature Extractionof Iris and Fingerprint Images for Multimodal Biometrics Identification

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**ABSTRACT**
Biometrics system basically use for pattern recognition also in this we have physical and biological characteristics.
The physical biometrics characteristics
Categories as fingerprint, face recognition, palm, voice and biological includes gait, keystroke. The challenge in biometric system is that whatever changes intruder has done with the template it should not be accepted by the biometric system. This paper discussed about the two biometric templates (E.g. Fingerprint and Iris) which were fused together for identification. These templates were preserved with security. Template protection offers more advantage for better privacy which gives reliable biometric authentication to the user.
**Keywords**: Fingerprint, Iris, Biometrics, Security, Multimodal biometric, templates, modalities.

## I. INTRODUCTION

Now a days we are surrounded by such a globalize environment that our data can be accessible by everyone. So there is a possibility that the template can be hacked by intruder. Our data cannot be accessed by intruder for that purpose we need Security for the biometrics template. Biometrics systems basically used for uniquely recognizing person. There are two types of biometric systems Unimodal and Multimodal biometric systems. Unimodal Biometric Systems face several problems in person identification in case of noisy data, spoof attacks and unacceptable error rates. Multimodal Biometric System uses a combination of two or more biometric trait for identification. In a multimodal biometric system that uses different biometric templates, fusion can be done at four different levels. The four different levels of fusion are given below: Raw data detector level, Feature level, score level, decisiveness level.

## BlockDiagram

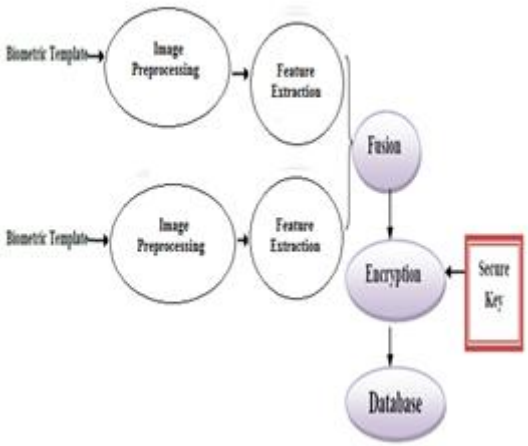


**FIG 1. STEPS OF BIOMETRICS**

**II.**

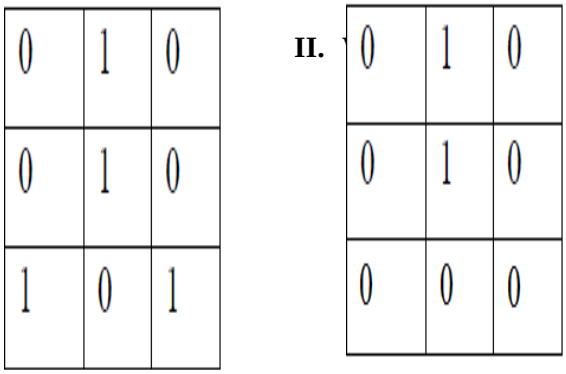


**FIG2. DETECTION METHOD OF BIFURCATION AND RIDGES**

The above figure shows the implementation of our multimodal biometric system. Firstly The Image acquisitions of two biometric templates were done. The next step involves the feature extraction from the biometric traits. The extracted features of both the modules stored in the database. After that template have to be compared with one of the existing template stored in the database. Result is obtained as a matching score of that template.

## III. FEATURE EXTRACTION FINGERPRINT:

Fingerprint recognition is done by several features such as minutia points (Bifurcation & ridges). The overall process can be divided into following operations:

1. Load the image
2. Binarization
3. Thinning
4. Minutia Extraction
5. Output image

Minutia Extraction is done by using mask operation a) Bifurcation b) Ridges

## IV. IMPLEMENTATION OF FINGERPRINT RECOGNIZATION SYSTEM:

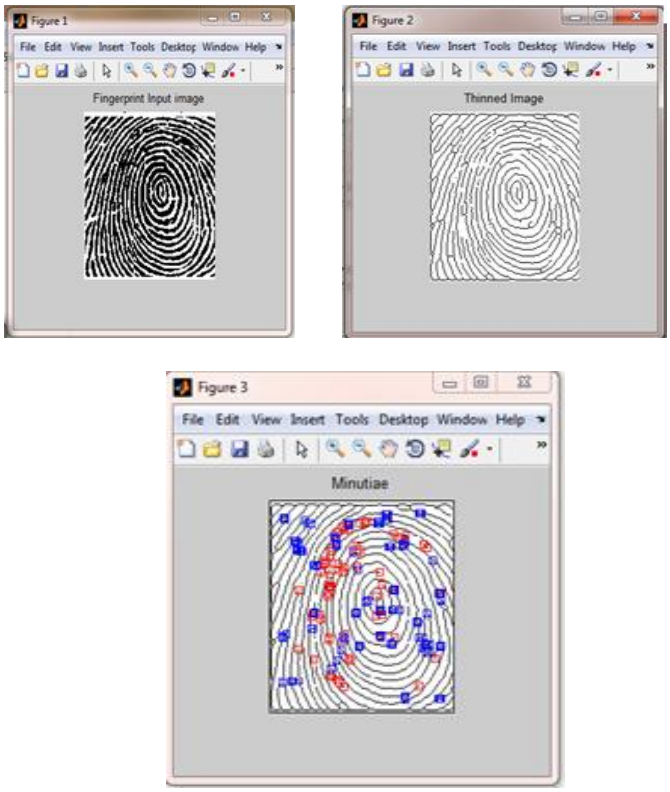


**FIG 3.FINGERPRINT FEATURE EXTRACTION WITH MINUTIA POINTS**

The fingerprint database used (db1_b.zip) by us are as follows:

## V. FEATURE EXTRACTION OF IRIS:

Iris feature extraction is obtained through of a Gabor filter.The overall process

Procedure is load the eye image into the system extraction of feature in the texture format which uses the Gabor filter that feature is represented in the iris code.

Hough transform used todetermine geometric entities such as line, circles. Circular Hough transform is used to

detect the radius and center coordinates of pupil and iris. The Equation for detecting the

circles as follows: k, l are the x and y coordinates ,g is the radius of circle.

$$k2+l2=g2 \qquad \text{(Eq.1)}$$

For detecting the edges of eye canny edge detection is used. It only recognizes the edges from the eye image. Now we have localized the iris region. Forconstant dimension we are using the daugman's rubber sheet.model.

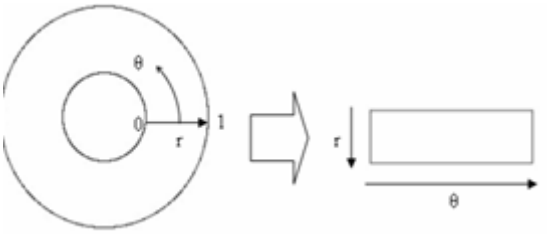


**FIG 4. DAUGMAN'S RUBBER SHEET**

Daugman's remap the each point of iris region to a polar coordinates(r,) where r is in the range of [0, 1] and $\boldsymbol{\theta}$ is of range[0,2pi].

The remapping of coordinates are done from circle's x and y coordinates it converts the

Coordinates into the polar coordinates .The equation is as follows:

$R= ag \pm ag2 - a - r2$

Where a =$\boldsymbol{\sigma}$x2+ $\boldsymbol{\sigma}$y2

$g= \cos(pi - \tanh{-1}\ \sigma x2/\sigma y2)$ (Eq.2)

The $\boldsymbol{\sigma}$x, $\boldsymbol{\sigma}$y determines the distance of center of the iris and center of pupil. We get the result in the format of rectangular portion.

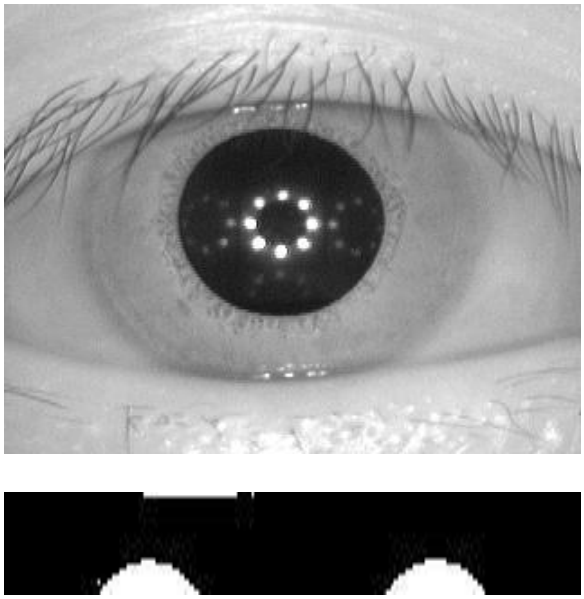

**FIG5. EXTRACTED FEATURE OF IRIS**

Increase in output with a material handling robotic system has saved factories money.
Affordability - With the advancements in technology, and affordable robotics becoming available at less cost, more pick and place robotic cells are being installed for automation applications.

## VI. APPLICATIONS

Biometrics helpful in :

- Laptops, Work Stations & Handheld device set.
- Door, Car, Garage Access
- ATM Access, Smart card.

## VII. CONCLUSION:

Feature –level fusion framework for the design of multimodal biometric system that simultaneously protects the multiple templates of a user using a single secure key will be proposed. The multimodal biometrics gives accuracy in providing results as compared to Unimodal system

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