International Journal of Research in advance Engineering,
Volume -1 Isuue-2, Feb-2015, Available at www.knowledgecuddle.com

A Study of Iris Recognition

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***Abstract*: Iris recognition is considered to be the most reliable and accurate biometric identification system available. Iris recognition system captures an image of an individual person's eye, than the image of iris is meant for the further segmentation and normalization for extracting its feature.Segmentation is used for the localization of the correct iris region in the particular portion of an eye and it should be done accurately and correctly to remove the eyelids, eyelashes, reflection and pupil noises present in iris region. The features of the iris were encoded by convolving the normalize iris region with 1D Log-Gabor filters and phase quantizing the output in order to produce a bit-wise biometric template. The Hamming distance was chosen as a matching metric, which gave the measure of how many bits disagreed between the templates of the iris.**

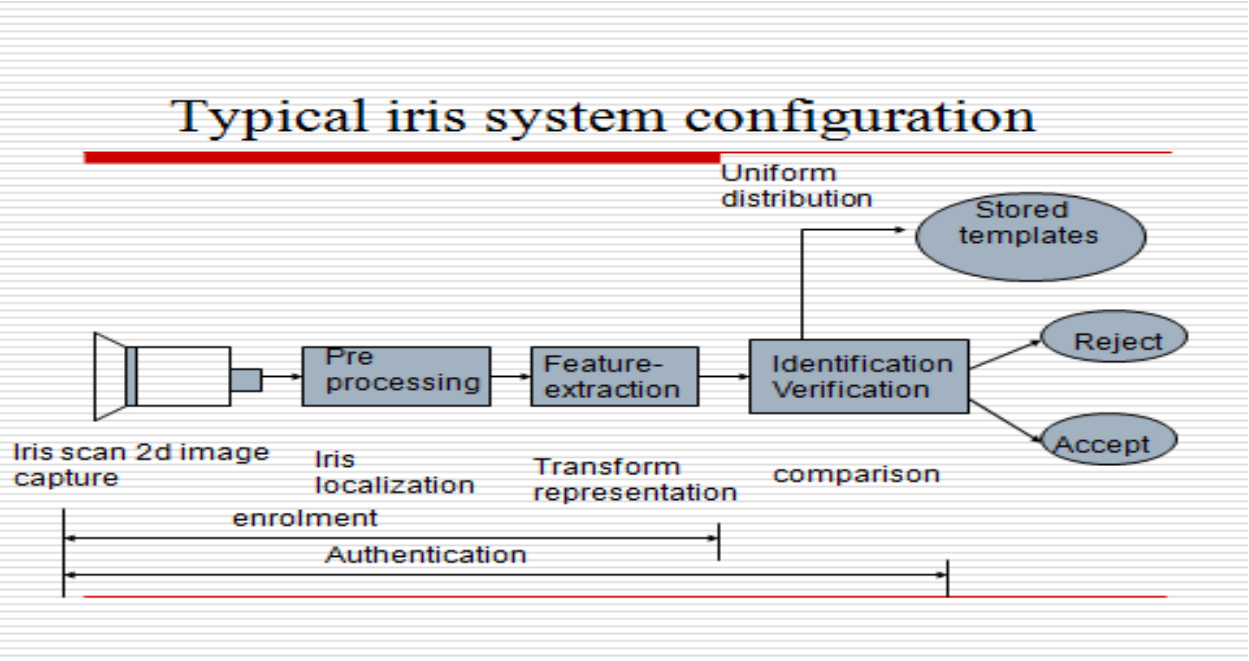
***Keywords*: Iris Recognition, Image Capturing, Localization, Feature Extraction, Template Matching**

I. INTRODUCTION

Iris recognition is a method of biometric recognition which use pattern recognition techniques based on high-resolution image of iris of individual person's. Iris scans process start with the capture of image of iris with high quality camera. The camera closes to the subject, not more than three feet. This process takes 0 to 1 second for scanning process.

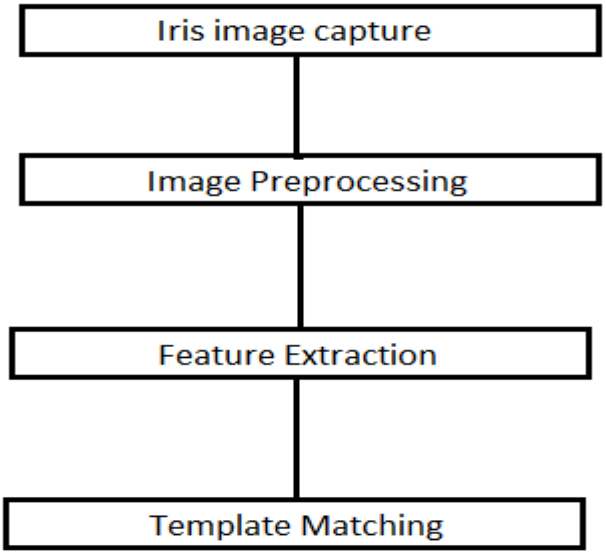
II. IRIS SYSTEM CONFIGURATION

In system configuration normally camera takes high resolution image of iris in 2D image form. Then image goes for image processing which remove the extra part of the image else of iris. Feature extraction process converts the image of iris in to the binary data and store in the templates. This process is for enrolment of person's iris data in to the device. Next process is comparison between the stored data and currently scanned data, if it matches then than device gives permission to access the machine or device, if it does not match then it rejects the scan and asks for scan.

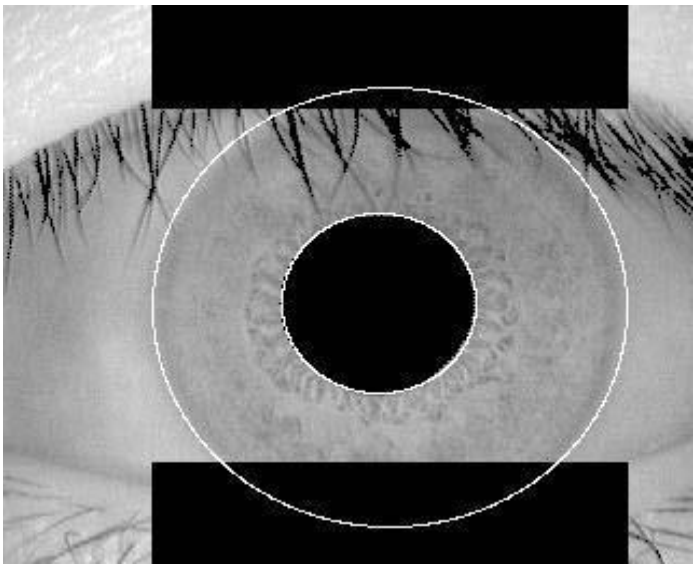


It deals with captu

ring of high quality image of the iris.Concerns on the image achievement rigs, find images with enough resolution and sharpness. Good difference in the iris pattern with proper clarification.[1]When iris is put 3 meter distance near infrared camera, it takes the high quality image.



Iris Localization



This is the process to remove the extra part of the image. Iris can be divided in to two circles one is iris boundary and second is pupil boundary. For iris localization we use the Dugman's algorithm [1].

Feature Extraction

Feature encoding was implemented by convolving the normalized iris prototype with 1D Log-Gaberwavelet.This process converts the 2D image in to the 1D image. 2D patterns are broken in to a number of 1D signals. Each row corresponds to a circular ring on the iris region. The angular direction is taken rather than the radial one, which corresponds to columns of normalized pattern [3].The features are extracted in codes of 0 and 1.

10 00 00 10 11 11 01 01 00 10 10 11 11 01

10 10 01 11 00 01 11 10 11 10 10 00 10 01 [1]

Template Matching

In template matching process, the hamming distance was chosen for recognition. The result of this computation is then used as the goodness of match, with smaller values indicating better matches.[8]The result of hamming distance is used as the good match. If the hamming distance are very close to 0 then matching of two patterns are better.

III. ADVANTAGES

- Very high accuracy.
- Verification time is generally less than 5 seconds.
- The eye from a dead person would deteriorate too fast to be useful, so no extra precautions have to been taken with retinal scans to be sure the user is a living human being.[13]

IV. DISADVANTAGES

- Intrusive.
- A lot of memory for the data to be stored.
- Very expensive[13]

V. APPLICATIONS

- ATMs
- Computer login: The iris as a living password.
- Premises access control (home, office, laboratory etc.).
- Internet security, control of access to privileged information
- Automobile ignition and unlocking; anti-theft devices.
- Anti-terrorism (e.g.:— suspect Screening at airports)[7]

VI. CONCLUSION

From the above result we can conclude that iris recognition is used for high-security. Iris recognition uses hamming distance concept and for image it uses high resolution camera. The hamming distance is close to zero, it means the patterns are match completely.

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