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Hamming Cut Matching Algorithm

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ABSTRACT

The hamming cut matching algorithm paper deals with the basics of iris, its properties and how it adds some advantageous features to recognize the correct person. In this paper we discuss the details regarding the information about how the iris is located, to distinguish it from other parts of the eye, how the scanner scans the whole pattern of the iris while enrolling and matching and how the scanned patterns are converted into 256 bytes of data so that it can be stored in the database. We compare the iris codes of the current person who wants to access the database and gives the matched results to the user accordingly. As the iris recognition technology produces very low false rate when compared to the other biometrics results it is very preferable in many systems such as airports, banks, deafens, etc.., where the security plays one of the major role. But in the case of fields where the database is huge, the comparisontime.

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Keywords--Retinal, iris,Hamming Distance.

I INTRODUCTION

Human is different each other. Even they are twins, they are still not identical in deep. In general way, we differ our self with a name. Each time human was born into the world, we give a name to recognize him or her among others. Therefore, we called "a name" as an human identity. Besides that, we could identify someone from his or her characteristic. Normally, we identify by looking his or her skin colour, face shape, height, body, etc. Those characteristic are included to be as visible characteristic. More on, visible characteristic means that the identification is simple to do it. Invisible characteristic is harder to do the identification. Even hard to do, invisible characteristic is more accurate and unique. In invisible characteristic, using DNA, finger, face, and any of human part that could be used as an identity. So, every human has their own information that differs to others. In study research, this knowledge called by Biometric System. Biometric system provides automatic identification of an individual based on an unique feature or characteristic.

II METHODOLOGY

The first stage will be to develop an algorithm to automatically segment the iris region from an eye image. This will require research into many different techniques such as Daugman'sintegrodifferential operator, circular Hough transform, and active contour models [18].Following this, the next stage will be to normalize the iris region in order to counteract imaging inconsistencies such as pupil dilation. An implementation of Daugman's polar representation [2] will be used for this purpose, as this is the most documented method for iris normalization. Once a normalized iris pattern has been obtained, it will be convolved with 2D Gabor wavelets in order to extract features.

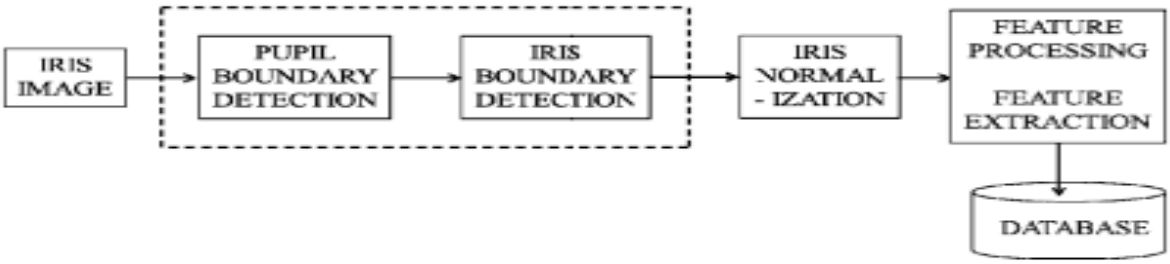

Fig: Enrolment process

Figshows the enrolment process of the research methodology that is going to be used in our research work is presented in this section (the methodology may be revised in future also for the future works that we are going to implement)This method is well documented in papers by Daugman [2], and also Boles [4] and a MATLAB function by Kovesi [10] is available to perform Gabor wavelet analysis. Finally, matching and statistical analysis will be performed in order to test how well iris patterns can be identified against a database of pre-registered iris patterns again this is well documented in the open literature. In the early stages of the project, the primary objective will be to get results. Once results are obtained and analyzed, the different parts of the software will be optimized, corrected and matching re-run. This iterative cycle will proceed until satisfactory results are obtained.

III BIOMETRIC SYSTEMS

The determination, measuring, and codification of the unique characteristic traits that each of us is born with is known as the science of biometrics. Various forms of computer-based biometrics for personal authentication have been around for the past twenty years, but not until recently have some reached maturity and a quality/reliability that has enabled their widespread application. In the past, hand geometry enjoyed the advantage of very small templates (codes containing the biometric data), but with modern computers this is no longer the main issue and iris based solutions are steadily gaining ground. **Retinal, iris,** and **fingerprint** recognition are mature technologies with the most reliable performance. Of the three methods, **iris** recognition is the least intrusive (unwanted involvement) with greater accuracy.

IV BLOCK DIAGRAM

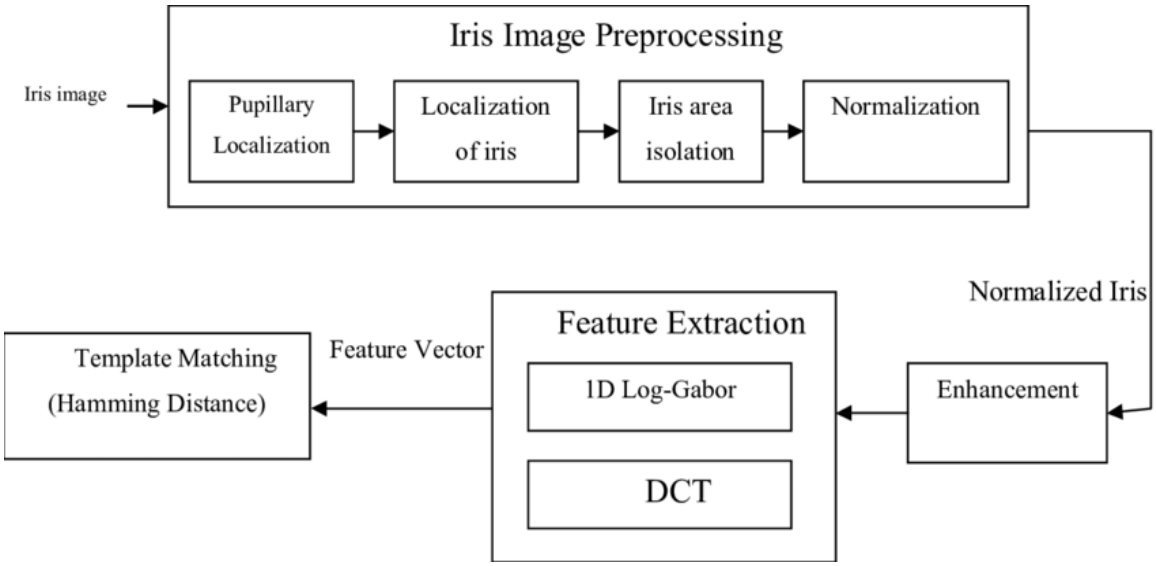

Fig: Block diagram of iris recognition system

Fig shows the original eye image was presampled to (260×320) pixels to crop the unneeded parts of the eye image, as well as to decrease the processing time during the pupil boundary (iris inner boundary) detected [80]. Through feature extraction process, 1D log-Gabor used and so the verification associated results compared by the ones handled by using DCT to achieve the best accurate method.

V HAMMING DISTANCE

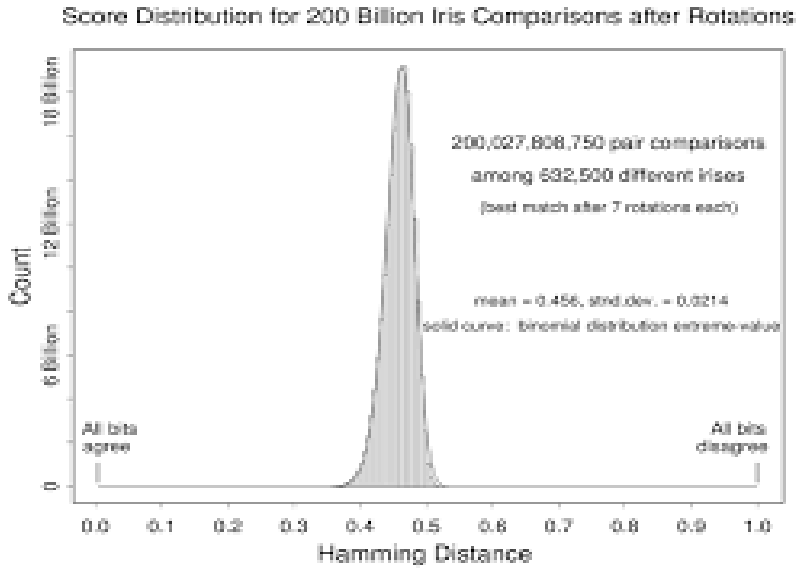

Fig: Hamming Distance

Fig shows that any bits that don't match are assigned a value of one and bits that do match a value of zero. Once all the bits have been compared, the number of non-matching bits is divided by the total number of bits to produce a two-digit figure of how the two Iris Code records differ. For example a Hamming Distance of 0.20 means that the two Iris Code differ by 20%.

$$\text{Hamming Distance} = \frac{\text{Number of non-matching bits}}{\text{Total number of bits}}$$

VIIADVANTAGES

- Uniqueness will be maintained between even the multi-birth children and so it is very difficult to forge
- There will be no effect on our eyes since there is no direct contact.
- The accurateness of the scanning technology is great with error rates being very low.
- Scalability and speed is high when compared to other systems.
- Internal organ, highly protected and rarely damaged or changed
- Iris patterns possess a high degree of randomness Imaging procedure is non-invasive
- Template size is small Image
- Encoding and matching process is fast.

VII APPLICATIONS

- Hamming distance If two patterns are derived from the same iris, the Hamming distance between them will be close to 0. 0 due to high correlation
- In order to account for rotational inconsistencies, one template is shifted left and right bit-wise and a number of Hamming distance values are calculated from successive shifts.
- The smallest Hamming distance is selected as it corresponds to the best match between two templates.
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VIII CONCLUSION

Passwords, token cards and PINs are all risks to the security of an organization due to human nature. Our inability to remember complex passwords and tendency to write these down along with losing token cards or forgetting PINs all contribute to the possible breakdown in security for an organization. The uniqueness of the iris and low probability of a false acceptance or false rejection all contribute to the benefits of using iris recognition technology. It provides an accurate and secure method of authenticating users onto company systems, is a non-intrusive method and has thespeed required to minimize user frustration when accessing company systems. Users no longer have to worry about remembering passwords and system administrators no longer need to worry about the never-ending problem of users disclosing passwords or having weak passwords that are easily cracked. As according to our implementation the comparison time of the iris code with the iris database is very much less from the current system.

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