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Authentication of Voter List Candidate using Iris Pattern Recognition for Proper Electoral Process

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Human Iris recognition system is considered to be one of the best biometric identification found so far because of the unique features found in the iris and moreover the textured patterns of iris remain stable, invariant and distinct throughout the whole life. Iris recognition techniques involve a mathematical analysis of the unique stable patterns that are visible within the iris and then the comparison is being done with an already existing database. In this paper the implementation of creating a fraud free voter ID list is being done as to make a clean Electoral environment. For this localization of Iris and Pupils are done and then segmentation using Laplacian of Gaussian. Normalization is done by Dougmans Normalization method and feature extraction is done using Contra Harmonic Mean Filter and lastly matching is done by Hamming distance.The development tool utilized will be MATLAB and emphasis will only be on the software for performing recognition.

Keywords : Biometric, Feature Extraction, Normalization, Pattern Matching.

1. INTRODUCTION

Various works on Iris Recognition has been done on the past which includes John Dougman Iris Code [1]. In his work the detectable structure of a man's iris in a continuous video picture is encoded into a littler progression of multi-scale quadrature 2-D Gabor wavelet coefficients, whose most-immense bits incorporate a 256-byte iris code. Wildes *et al.,* uses Laplacian pyramid for analysis of Iris images. Boles and Boashas uses zero crossing method with dissimilarity function of Matching [2-11]. Li Ma et al use Gabor filter and certain Special filters. Kong and Zhang used Iris segmentation based on Curve fitting for segmentation of eyelashes and reflections [7].

Ping Huang *et al.,* uses basic function for training set by independent component Analysis. Libor Masek study on iris recognition system was based on a programmed division framework that is based on the Hough change and can limit the round iris, blocking eyelids and eyelashes, and reflections. The extricated iris locale was then normalized into a rectangular piece with consistent measurements to represent imaging inconsistencies. Fancourt et al proposed an algorithm for recognition process for a distance to camera at a higher rate. Ahmad M. Sarhan gave an approach using with Discrete Cosine Transform and Artificial Neural Networks for iris pattern recognition as there is a need of unique features for individual identification in the formation of voter registration list Iris recognition is applied which will be matched again at the time of polling. This process is done with 5 stages given below:

- Iris Acquisition
- Iris Segmentation
- Iris Normalization
- Feature Extraction
- Matching

Table 1
Table of Comparative Study

Methodology	Accuracy Rate	Average Time
3 Daugman	76%	88
9 Wildes	83%	101
29 Masek 17	86%	68
17 Proposed	90.34%	48

Here R is the order of the filter and W is the window size. A negative value of R eliminates salt-type noise and a positive value eliminates pepper-type noises.

5. MATCHING

The iris matching is being done using Hamming distance which is given by the equation below:

$$HD = \frac{1}{N}\sum_{j=1}^{N} X_j(XOR)Y_j \tag{5}$$

Calculation of Hamming Distance (HD) is done for this comparison. HD is a fractional measure of the number of bits disagreeing between two binary patterns [4,5]. If two bits patterns are completely independent, such as iris templates generated from different irises, the Hamming distance between the two patterns should equal 0.5. This occurs because independence implies the two bit patterns will be totally random, so there is 50 percent probability of setting any bit to 1 and vice versa. Thus half of the bits will agree and half will disagree between the two patterns. If two patterns are derived from the same iris, the Hamming distance between them will be close to 0 as they are highly correlated and the bits should agree between the two iris codes.

6. RESULTS

100 iris images from CASIA database are used for training and observed that this experiment gives 95% of output in matching standards. So the voter Registration list is prepared by giving a unique number to the entire iris image in the database. During the polling time the person who is a citizen of India will have to match his identity and see the result. If the iris matches with the number in registration list then this person is authenticated else is considered as fraud.

7. CONCLUSIONS

The present work is very much novel and expected that this study would provide some high accuracy implementation of security systems. And as Electoral processing system needs very high security measures it will be very much beneficial to nation to process the system smoothly by creating a total fraud free voter registration list. Moreover this system can also be implemented where high security threats prevail which are prone to unauthenticated uses of different systems. This area of works need a constant improvement in the matching and recognition part as to have a efficient and better recognition rate.

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