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A PATH FOR HORIZING YOUR INNOVATIVE WORK

IRIS RECOGNITION FOR PERSONNEL IDENTIFICATION USING NEURAL NETWORK: A REVIEW

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Abstract: Biometrics is one of the vastly growing fields for human identification. In all of the biometric identification systems Iris is taking too much attention because of its reliable and secure identification measures. Iris recognition system consists of localization of the iris region, generation of data set of iris images and then iris pattern recognition. This paper presents iris recognition for personal identification using neural networks.

Keywords: Localization, Pattern recognition, Neural network etc.

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INTRODUCTION

In today's information technology world, security for systems is becoming more and more important. The number of systems that have been compromised is ever increasing and authentication plays a major role as a first line of defence against intruders. Biometric identification utilises physiological and behavioural characteristics to authenticate a person's identity. A biometric system works by capturing and storing the biometric information and then comparing the scanned biometric with what is stored in the repository. Out of all the various physical characteristics available, irises are one of the more accurate physiological characteristic that can be used.

2. Literature Review

[1] Prateek Verma, Maheedhar Dubey; International Journal of Emerging Technology and Advanced Engineering, Daughman's Algorithm Method For Iris Recognition-A Biometric Approach

- In this paper Daughman's segmentation Algorithm method for Iris Recognition is given.

(1) The segmented iris region was normalized to minimize the dimensional inconsistencies between iris regions by using Daugman's Rubber Sheet Model.

(2)Then the features of the iris were encoded by 1D Log-Gabor filters and phase quantizing the output in order to produce a bit-wise biometric template.

(3) The Hamming distance was chosen as a matching metric.

[2] R. P. Wildes, —Iris recognition: An emerging biometric technology, Proc. IEEE

This paper includes

(i) A Hough transform for iris localization,

(ii)Laplacian pyramid(multi-scale decomposition) to represent distinctive spatial characteristics of the human iris, and

(iii) Modified normalized correlation for matching process.

[3] J.Daugman's and R.Sanchez-Reillo's; J. Daugman, —High Confidence Visual Recognition by a test of Statistical Independence, IEEE Trans.

In this, systems are implemented exploiting

(I) integrodifferential operators to detect iris inner and outer boundaries,

(II) Gabor filters to extract unique binary vectors constituting iriscode, and

(III) a statistical matcher that analyses basically the average Hamming distance between two codes.

[4] Boles. W & Boashash.B; A Human identification technique using images of the iris and wavelet transform. IEEE transactions on signal processing

This paper includes

(j) a one dimensional representation of the gray level profiles of the iris followed by obtaining the wavelet transform zero-crossings of the resulting representation, and

(jj) original dissimilarity functions that enable pertinent information selection for efficient matching computation.

3. Proposed work

1) Image Acquisition:-

This is very first step of the entire process.

2) Preprocessing:-

The acquired iris image has to be preprocessed to detect the iris. The first step in iris localization is to detect pupil and second is outer iris localization.

3) Feature Extraction:-

Five level wavelet tree showing all details and approximation coefficients using Haar wavelet. These levels are cD1h to cD5h ,cD1v to cD5v and cD1dto cD5d.Then the coefficients that represent the core of the iris pattern are chosen and the patterns in cD1, cD2, cD3 and cD4 are almost the same so only one of them is chosen. Here cD4h is taken as representative.The fifth level does not contain the same textures and should be selected as a whole .Thus Combination of six matrices are:

1) cD4h and cD5h , 2) cD4v and cD5v ,

3) cD4d and cD5d.

This vector is called the feature vector. If “Coef” is the feature vector of an image than the following quantization scheme converts it to its equivalent code-word:

• If Coef(i) >= 0 then Coef(i) = 1

• If Coef(i) < 0 then Coef(i) = 0

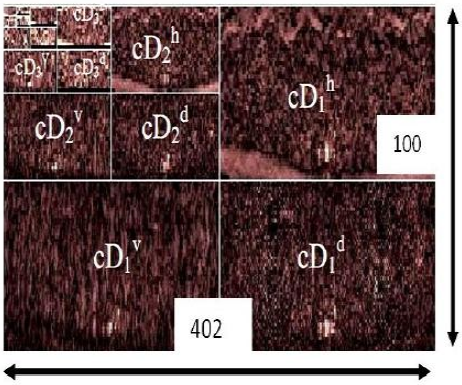
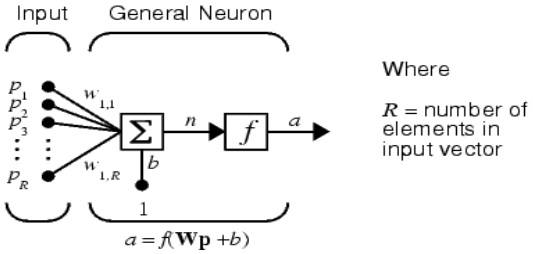


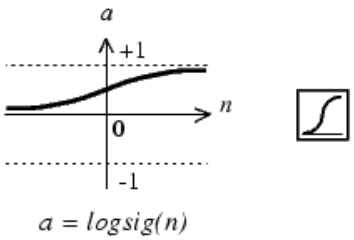
Figure 1:- Conceptual diagram for organizing feature Vector.

4) Classifier:- Multilayer Neural Network

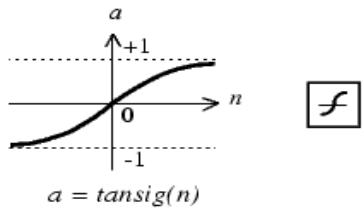
An elementary neuron with R inputs is shown below. Each input is weighted with an appropriate w. The sum of the weighted inputs and the bias forms the input to the transfer function f.



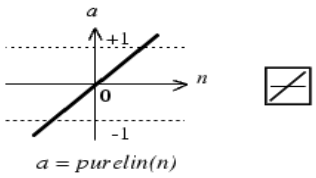
Multilayer networks often use the log-sigmoid transfer function logsig.



Alternatively, multilayer networks can use the tan-sigmoid transfer function tansig.

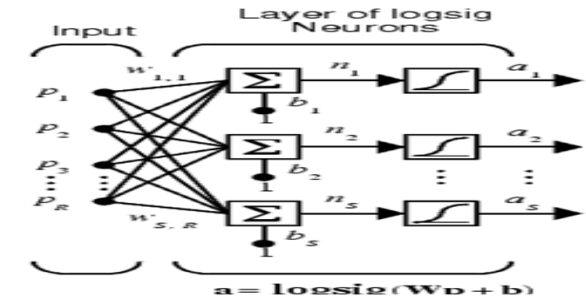


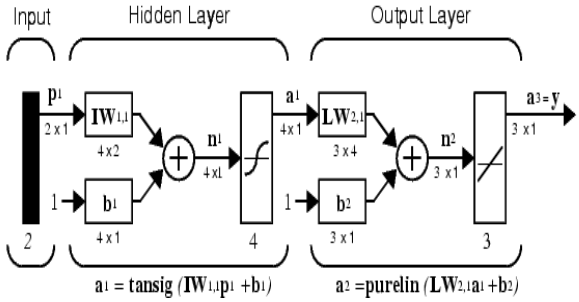
linear output neurons are used for function fitting problems.



Feedforward Network

A single-layer network of *S* logsig neurons having *R* inputs is shown below. Feedforward networks often have one or more hidden layers of sigmoid neurons followed by an output layer of linear neurons. Multiple layers of neurons with nonlinear transfer functions allow the network to learn nonlinear relationships between input and output vectors. The two-layer tansig/purelin network is given below. This network can be used as a general function approximator.





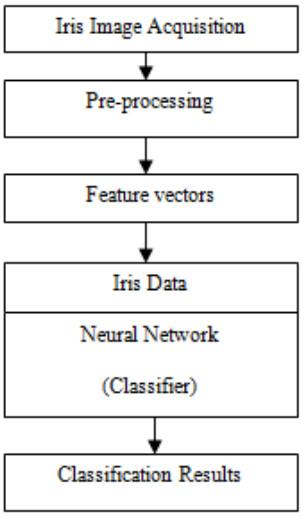


Figure 2:- The flow diagram of iris recognition

4. DISCUSSION

Biometric identification utilises physiological and behavioural characteristics to authenticate a person's identity. Iris pattern is more complex and more random than other biometric patterns and hence offers a highly precise method for individual authentication.And using neural network as a classifier we will try to reduce computational time.

5. CONCLUSION

The need for secure methods of authentication is becoming increasingly important in the corporate world today. Passwords, token cards and PINs are all risks to the security due to human nature. Instead of carrying bunch of keys or remembering things as passwords we can use ourself as living password, which is called biometric recognition technology In this project, using Neural Network as a classifier we will try that the proposed method should be excellently effective, and should achieve a considerable computational reduction while keeping good performance.

6. REFERENCES

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