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DETECTION OF DIABETIC PRESENCE FROM IRIS BY USING SUPPORT VECTOR MACHINE

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ABSTRACT

This is a simple and non-intrusive method to detect diabetic in body and iris recognition is not only mainly for biometric identification but it can also be used as a mean to detect diabetic or maybe diagnose any diseases as iridology claimed it is supposed to be.The attempt is being made to explore the area of diagnosis from different perspectives. The approach used is a combination of ancestor's technology Iridodiagnosis with modern technology. To begin with a database is created of eye images with clinical history of subject's emphasis on diabetic (type II) disease in pathological laboratory.

The various algorithms are developed for image quality assessment, segmentation of iris, iris normalization and clinical feature classification for clinical diagnosis. The Support Vector Machine is used for training and classification purpose. Others application that can use this program is to determine the eye problem due to other type of eye diseases such as cataract, glaucoma, cholesterol , tumour etcetera. This approach will be useful in the diagnosis field which is faster, user friendly and less time consuming.

KEYWORDS: Classification, Diabetic, Feature extraction, iridodiagnosis, Iris, Segmentation

INTRODUCTION

The objective of this paper is to explain how the presence of diabetic can be detected by using iris recognition algorithm. This method used the John Daugman's and Libor masek's iris recognition methods and extends the study of eyes pattern to other application and in this case, the alternative medicine that is iridology. Based on the iris recognition methods and iridology chart, a MATLAB program has been created to detect the present of diabetic in our body.[1]However, further analysis must be done in order to know the exact range or level of Diabetic. Iridolgy is the branch of science that deals with the study of iris i.e. colored part of the eye.The Iris is the greenish-yellow area surrounding the transparent pupil (showing as black). The white outer area is the sclera; the central transparent part is the cornea. The main intention of irido diagnosis is to collect some information about underlying disease.[3]

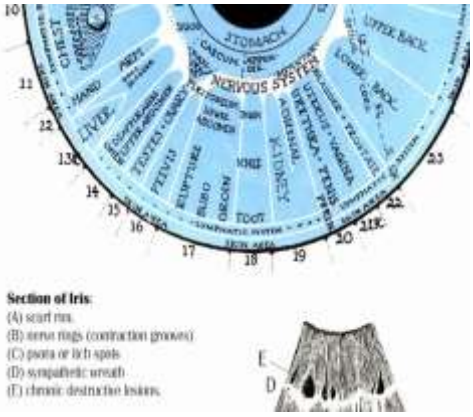

Fig.1: Iris Chart

PROPOSED SYSTEM

The framework followed in this paper is illustrated in the fig (1).

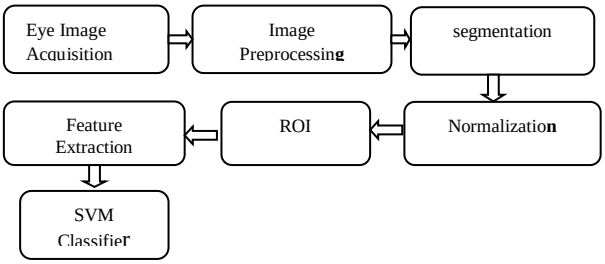

Fig2: Block diagram of proposed approach

A) Eye Image Acquisition:
(CASIA, 2003), iris image database (version 1.0, the only one that we had access to) database, its images were captured within a highly constrained capturing environment, which conditioned the characteristics of the resultant images. They present very close and homogeneous characteristics and their noise factors are exclusively related with iris obstructions by eyelids and eyelashes. Initially the eye image is captured with the help of certain cameras, and stored in the database which contains normal as well as abnormal results of iris.[2]

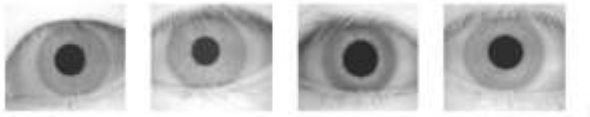

Fig.3: CASIA database

B) Image pre-processing:
The pre-processing is done in order to reduce the presence of noise in the iris image and enhancement is done in order to manipulate an image so that the result is more suitable than the original. The adaptive median Filter is used here for removing the pepper &salt noise. It makes the hidden features of an image more available for us. Enhancement is done for improving the details of an image.[4]

C) Segmentation:
This segmentation (localization) process is to search for the centre coordinates of the pupil and the iris along with their radius.[1] These coordinates are marked as *ci*, *cp*, where *ci* represented as the parameters of [*xc*,*yc*,*r*] of the limbic and iris boundary and cp represented as the parameters of [*xc*,*yc*,*r*] of the pupil boundary. Segmentation is done in order to find inner and outer boundaries of the iris. [10]By subtracting pupil from sclera, we will get the iris part of an eye [5]. Once the iris region is segmented from an eye, the next step is to transform the iris region into fixed dimensions. After subtraction, we will get the iris pattern into circular shape. [4]

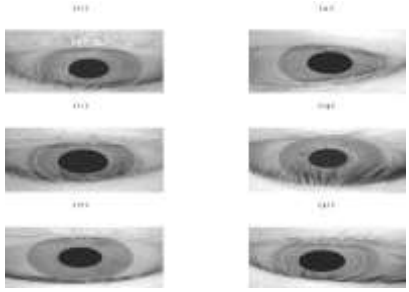

Fig.4: Iris segmentation

D) Normalization:
Normalization is done to convert circular iris pattern into rectangular shape.

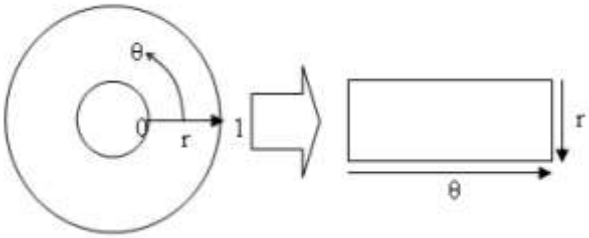

Fig. 5: Daugman's rubber sheet model

E) ROI extraction:
After normalization, the next step which comes into picture is ROI extraction. ROI extraction is nothing but cropping particular portion of normalized iris image.[1]

F) Feature extraction:
The region of interest is identified by visual inspection as per chart of Iridology. The feature is defined as a function of one or more measurements, each of which specifies some quantifiable property of an object, and is computed such that it quantifies some significant characteristics of the object. [5]

Texture is property of images. Texture is a powerful regional descriptor that helps in the retrieval process. Texture, on its own does not have the capability of finding similar images, but it can be used to classify textured images from non-textured ones and then be combined with another visual attribute like color to make the retrieval more effective.Texture has been one of the most important characteristic which has been used to classify and recognize objects and have been used in finding similarities between images in multimedia databases.[7]

G) SVM classification:
SVM classification is the important part of the approach because the overall process depends upon the classification done through this algorithm. SVM

is relatively new method of classification and it expands very quickly. That will certainly cause wider use of SVM in different areas, also in medicine. **[8]**

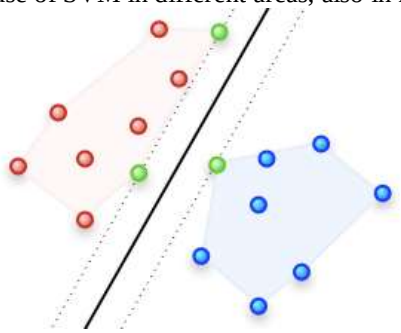

Fig.6: SVM structure

EXPERIMENTAL RESULTS

The detection of diabetes using Iridology includes image acquisition, pre-processing, segmentation, Iris region, Normalization, Feature extraction, Classification. The results shown in fig are up to region of interest extraction for particular diagnosis using irido chart. Here We use 8 database & out of that 4 are normal patients & 4 are abnormal Patient eye images. After going through classifier they shows 3 are showing correct for class 1& for class2 3 images are correct out of 4. So the accuracy this is 75%.

Fig7. Experimental Results of confusion Matrix showing accuracy

CONCLUSION

We conclude that there is a simple and non-invasive method to detect diabetic in body and iris recognition is not only mainly for biometric identification but it can also be used as a mean to detect diabetic or maybe diagnose any diseases as iridology claimed it is supposed to be. For clinical feature analysis, enhancement is essential for extraction of deep layer features. For feature extraction various image enhancement methods like arithmetic operation, histogram equalization, and adaptive histogram equalization have been applied. The approach used is a combination of ancestor's technology. Iridodiagnosis is an alternative branch of medical science, which can be used for diagnostic purposes. This approach will be useful in the diagnosis field which is faster, user friendly and less time consuming .

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REFERENCES

1. On a Methodology for Detecting Diabetic Presence from Iris Image Analysis U. M Chaskar, M. S. Sutaone 978-1-4673-0449-8/12/$31.00 ©2012 IEEE
2. Detecting Cholesterol Presence with Iris Recognition Algorithm Ridza Azri Ramlee, Khairul Azha and Ranjit Singh Sarban Singh University Teknikal Malaysia Melaka (UTeM), Malaysia 2011
3. J. Daugman, "How iris recognition works", IEEE Transactions on Circuits, Systems and Video Technology, vol. 1, pp. 1–17, 2003.
4. J. Daugman, "New methods in iris recognition," IEEE Transactions on Systems, Man, and Cybernetics, Part B, vol. 37, pp. 1167-1175, 2007.
5. Richard P. Wildes "Iris recognition: An emerging biometric technology." proceedings of the IEEE, 85(9):1348–1363, Sep. 1997.
6. Preprocessing and Image Enhancement Algorithms for a Form-based Intelligent Character Recognition System International Journal of Computer Science & Applications Dipti Deodhare, NNR Ranga Suri R. Amit Centre for AI and Robotics, Computer Science Dept Raj Bhavan Circle, Univ. of Southern California,Bangalore,India. USA.Email:{dipti, nnrsuri}@cair.res.in.
7. Artificial Neural Networks vs.Support Vector Machines for Skin Diseases Recognition Micha l Antkowiak May 3,
8. Support Vector Machines for Classification

9. http:// www.irisdiagnosis.org (Accesses May 2010).
10. Iris Segmentation Approaches for Iris Recognition Systems Ms. Sruthi.T.K International Journal of Computational Engineering Research||Vol, 03||Issue, 5||