ISSN: 2277-9655
(I2OR), Publication Impact Factor: 3.785

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

ON A METHODOLOGY FOR DETECTING DIABETIC PRESENCE FROM IRIS IMAGE ANALYSIS

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ABSTRACT

Iris image analysis for clinical diagnosis is one of the most efficient non-invasive diagnosis methods for determining health status of organs. Correct and timely diagnosis is a critical, yet essential requirement of medical science. From the literature, it is found that modern technology also fails in lot of cases to diagnose disease correctly.

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. Iridodiagnosis is an alternative branch of medical science, which can be used for diagnostic purposes. 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. This approach will be useful in the diagnosis field which is faster, user friendly and less time consuming.

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

INTRODUCTION

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. As technology has developed, there are various methods present for the diagnosis which are highly reliable and accurate. Basically, irido-diagnosis is consists on empirical science, to look into the particular area of eye for systemic health condition of the specific organ of the body. Iridology is the diagnosis of medical conditions and "pre-disease states" through abnormalities of pigmentation in the iris. The location of abnormalities on the iris is associated with the location of the medical condition in the body. The iris of the eye is divided into 60 sectors; each sector is corresponding to an inner organ. The iris is associated via multiple nerve connections to the organs. Depending on the features of the iris classification is done and diabetic is detected. Iridodiagnosis can also be used to detect Gall Bladder Disease in the patient's iris.[1][2]

PROPOSED SYSTEM

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

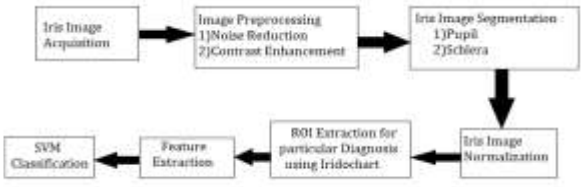

Fig.1: Block diagram of proposed approach

A) Eye Image Acquisition:
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.
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. It makes the hidden features of an image more available for us. Enhancement is done for improving the details of an image.[7]
C) Segmentation:
Segmentation is done in order to find inner and outer boundaries of the iris. 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. [5]
D) Normalization:
Normalization is done to convert circular iris pattern into rectangular shape.

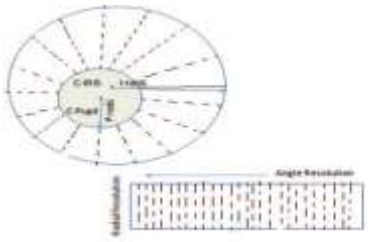

Fig. 3: Iris Normalization

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.[3]

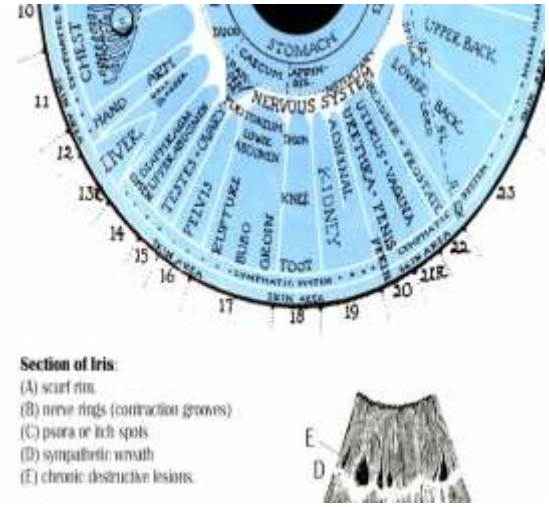

Fig.3. ROI Extraction

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. **[8]**
Texture

Texture is another important 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.

- Mean
- Standard Deviation
- Entropy
- Skewness
- Smoothness
- Contrast
- Kurtosis
- Homogeneity

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.

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.

SVMs can be used to solve various real world problems.[9]

EXPERIMENTAL RESULTS

For clinical feature analysis, improvement is necessary for extraction of deep layer features. For feature extraction various kinds of image enhancement methods like arithmetic operation, histogram equalization, and adaptive histogram equalization have been applied.

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.

Fig.4.Experimental result of normal person iris

Fig.5. Experimental result of diabetes person iris

Fig.6. Results of confusion Matrix

IV 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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ACKNOWLEDGMENT

It is pleasant Endeavour to present paper on "**Methodology for Detecting Diabetic Presence from Iris Image Analysis**." I take this opportunity to express my gratitude towards my guide for his constant encouragement and guidance. He is a constant source of motivation and inspiration. Without his efforts the project could not have taken to this stage. I also would like to thank to our **H.O.D.** and **M.E. Co-ordinater** for their cordial support and who have co-operated and provided valuable information for this Paper.

I would like to extend my gratitude to all my family & friends who have extended their support and helped me to complete Paper. Words fall short to express my deep sense of gratitude towards them all, who have directly or indirectly helped in making this paper

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 biometrictechnology." 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 and Regression by Steve R. Gunn
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||

11. A Survey: Feature Extraction Methods for Iris Recognition International Journal of Electronics Communication and Computer Technology (IJECCT) Volume 2 Issue 6 (November 2012

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