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Research Article

Analysing Retinal Disease Using Cleha and Thresholding

CH.JAIRAM[1],A. MANIKANTA[2],G. BHARGAV REDDY[3],B. RATNA BABU[4],MRS. T. BHAVANI[5]
[1,2,3,4]B.Tech Student, Department of ECE, KKR&KSR Institute of Technology and Sciences, Guntur, AP, India.
[5]Associate Professor, Department of ECE, KKR&KSR Institute of Technology and Sciences, Guntur, AP,India
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ABSTRACT
Diabetic retinopathy (DR) is an important cause of blindness worldwide. However, DR is hard to detected in early stages and the diagnostic procedure can be time-consuming even for experienced experts. Therefore, a computer-aided diagnosis method based on Thresholding algorithms is proposed to automatedly diagnose the referable diabetic retinopathy (RDR) by classifying color retinal fundus photographs.

Keywords: Diabetic based application, Retinopathy, Diabetic Persons, Thresholding, Retinal Disease

I. Introduction

Diabetes is a disease that affects blood vessels throughout the body, particularly in the kidneys and eyes. When blood vessels in the eye are affected, the condition is referred to as diabetic retinopathy (DR). Diabetic retinopathy is a major public health problem and a leading cause of blindness in the World. Diabetic retinopathy is a micro vascular complication that may occur in patients with diabetes. The occurrence of diabetic retinopathy will result in the disturbance of visual capability and can eventually leads to blindness. There are more chances for development of diabetic retinopathy if the diabetic person is not treated for long period of time.

1.1 Problem Statement

In this method we are going to take retinal images of the person. Analyzing using CLEHA and thresholding methods. If that image shows the diabetic symptoms, then that person is diabetic person.

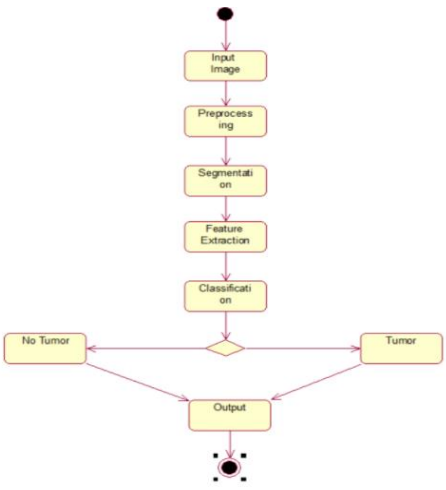
1.2 Literature Survey

In Existing system, the exudates are detected using the combination of back ground subtraction of fundus image, exudate candidate extraction and other anatomy detection. Compared to the rest of the state of art segmentation techniques the proposed method can identify the hard exudates present in the fundus images with easy and acceptable sensitivity and accuracy. From the experimental results it could be seen that we can use the above methodology to screen the diabetic retinopathy.

- Many systems are confined only to segmentation.
- They suffer from certain technology issues.
- Less accuracy.

II. Proposed System

2.1 Flow Chart

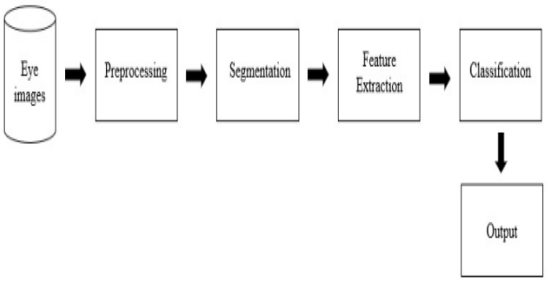


2.2 Proposed Idea

In proposed method, For the proposed system, STARE and DIARETDB1 datasets images are taken. In which high quality and resolution fundus images of retina are present. The image which is of size 605×700 is converted to Gray scale image. In adaptive histogram equalization, images are subjected to the CLAHE (contrast limited adaptive histogram equalization).

Then the median filter is applied to remove the noise from the input image and also to smoothen the picture.This system is identified whether the retinal image is normal or diabetic. If the retinal image is normal, it produces the results as Normal. If the retinal image is diabetic, it produces the results as Diabetic.

III. System Design



The image which is of size 605×700 is converted to Gray scale image. In adaptive histogram equalization, images are subjected to the CLAHE (contrast limited adaptive histogram equalization). Then the median filter is applied to remove the noise from the input image and also to smoothen the picture. In the segmentation the image is segmented using the thresholding but the level value is selected by using iterative method.

In adaptive equalization, Contrast Limited Adaptive Histogram Equalization is implemented. To increase the contrast of the picture, CLAHE is taken. By implementing the CLAHE, boundaries of the two closes are amplified. CLAHE will prevents the over amplification of noise which results in adaptive histogram equalization technique.

Segmentation is the process of extracting the true object from the background picture. In this algorithm, there is no need of pre knowledge about the image. Iterative method had its own process to know the capabilities of the image. Manually, when we give the thresholding value to the picture, object (useful information) will be erased and also more amount of noise also segmented.

If the range of properties of the picture is widely different, then the thresholding also became very hard sometimes.

Automatic means of threshold value selection is required in this type of cases. By implementing the method, we can provide clearer extraction of the object region. Another added advantage of this method, the threshold values of the object and background are established.

Feature plays a very important role in the area of image processing. Before getting features, various image preprocessing techniques like binarization, thresholding, resizing, normalization etc. are applied on the sampled image. After that, feature extraction techniques are applied to get features that will be useful in classifying and recognition of images. Feature extraction techniques are helpful in various image processing applications e.g. character recognition.

IV. Implementation

Implementation is an important phase where the evelopment of the proposed system is based on the decisions made previously in the design and system requirement phase.

The modules are as follows:

A) Preprocessing Module

Exudates are bright lesions and they are present as bright zones or patches in the fundus image. We need to enhance the contrast of the image to improve the exudate detection because in the contrast enhanced image the exudates visibility increases. Here, we used the Contrast limited adaptive histogram equalization (CLAHE) technique to enhance the contrast of the image. CLAHE is used as the preprocessing of the fundus images. In the case of CLAHE, transformation function is derived by applying contrast limiting procedure to each neighborhood of the color image. The main advantage of CLAHE is to prevent the over amplification of noise which can be result of application of adaptive histogram equalization.

B) **Back ground detection and subtraction**

Back ground region of the fundus is the portion of the image where no retinal anatomy or lesions present, it consists of only the retinal layer of the fundus so it is an unwanted portion of the fundus image for screening of the DR. The detection of any anatomy or lesion present on the fundus image becomes simple, if we can detect and subtract the back ground region from the fundus image. By removal of back ground information we are left with only the retinal anatomy and lesions on the fore ground image of the fundus. In the literature there are morphological based methods to detect the back ground information of the fundus image.

Conclusion

In this present paper, the exudates are detected using the combination of back ground subtraction of fundus image, exudate candidate extraction and other anatomy detection. Compared to the rest of the state of art segmentation techniques the proposed method can identify the hard exudates present in the fundus images with easy and acceptable sensitivity and accuracy. From the experimental results it could be seen that we can use the above methodology to screen the diabetic retinopathy. An improvement in the performance could be achieved by using the machine learning based approach with selection of proper features for the exudates.

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