MES COLLEGE OF ENGINEERING, KUTTIPPURAM
DEPARTMENT OF COMPUTER APPLICATIONS
20MCA245 – MINI PROJECT

PRO FORMA FOR THE APPROVAL OF THE THIRD SEMESTER MINI PROJECT

(Note: All entries of the pro forma for approval should be filled up with appropriate and complete information. Incomplete Pro forma of approval in any respect will be rejected.)

Mini Project Proposal No :_____ *(Filled by the Department)*	Academic Year : 2020-2022 Year of Admission : 2020

1. Title of the Project : Identification of Retinal Diseases using Blood Vessel Extraction
2. Name of the Guide : Balachandran K P
3. Number of the Student: 01
4. Student Details (in BLOCK LETTERS)

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Date: 01/12/2021

Approval Status : Approved / Not Approved

Signature of Committee Members

Comments of The Mini Project Guide Dated Signature

Initial Submission :

First Review :

Second Review :

Comments of The Project Coordinator Dated Signature

Initial Submission:

First Review

Second Review

Final Comments :

Dated Signature of HOD

Identification of Retinal Diseases using Blood Vessel Extraction

AMRUTHA V V

Introduction:

In Retina vascular structure, the ophthalmologist identifies the retinal pathology to diagnose the retinopathy prematurity, diabetic retinopathy, hypertension, age related macular degeneration, glaucoma and to identify the brain and heart stocks diseases. The changes in retina venules morphology and arterioles are the indicative factor in finding diseases. The vessels segmentation occupies in the medical image segmentation arena, vessel segmentation turns in the group and inside the group, various techniques are implemented to find the retinal vasculature methods . The high contrast vessels retinal fundus images did not give direct result on eye abnormalities, lesions, microaneurysms and exudates. The retinal vasculature method is not suited for irregular retinal images and having anomaly data. The blood vessels consist of focal point illumination error and width error [3]. The contrast blood vessels is maximum for dense and small vessels. The retinal abnormality can be removed using the complex tree structures . Fundus image is the base for all the treatment of diseases related to eye. While trying to identify some diseases using computer applications, the blood vessels hinder the accuracy of the results. This is because of the fact that when the computer application fails to differentiate the symptoms of some diseases with that of the blood vessels.

Objectives:

The objective of our paper is to remove the blood vessels from the input fundus image there by enabling us to identify the diseases easily. Blood vessel in retina is an important component in finding the cardiovascular disease, ophthalmological disease and segmentation of vessel tree in retina is used for computer based identification systems. It has been identified that in some cases the symptoms of some diseases such as Diabetic Retinopathy, Hemorrhages cannot be differentiated from that of the blood vessels while training the fundus images. The Image segmentation process is examined to increase the accuracy using debauched vessel segmentation method which will help us to remove the blood vessels from the fundus images and provides easy processing. The precise retinal vessel segmentation has been established and executed. The blood vessel extraction is an edge enhancement and detection algorithm are

analyzed. It is suited for an abnormal retinal fundus image. It diagnoses the low vessel contrasts, drusen and exudates

Problem Definition:

Existing system

Edge detection filters and matched filters are the types of kernel-based approaches are proposed in literature. The higher kernel dense vessels are achieved in matched filter to attain the inflamed thickness in reedy vessels. The use of minor kernels can identify the reedy vessels with maximum benefits and subsequently, the dense vessels contain minimum thickness. An orthodox matched filter consists of diverged sized kernels in various alignments. Many images consist of various kernels and merged together to find the final tree model. The probing method helps to segment the blood vessels using indigenous and province-based assets. The pixels are classified as vessels and non-vessels based on threshold lessening. A tortuosity extend method is used for tree extraction that implements matched filters, thresholding, diminishing and classifiers to find the vessel tree. In literature, the localization and segmentation of optic disc for retinal images have been studied.

Proposed system

Edge Enhancement and Edge Detection method separates the surplus edges and does not consider the blood vessels. This method is faster and finds the good results. In literature, the retinal images are found as no anomalies in most of the methods. The significance of this Edge enhancement and edge detection method is used to improve the blood vessels contrast and diffuse the anomalous topographies in the retina image.

A retina image is convolved with gaussian large blurring kernel to extract the blood vessels. The blurred image contains only the illumination pattern and other patterns get lost. If the Gaussian blurred image is obtained from the retinal fundus image, the other image can be formed in two stages. The final image is the miniature of two images. The intensity in the lower range only is illuminated in a blood vessels of retinal fundus image. The blood vessels are having the lowest values with increased edges when compared to the background in a minimum image. In the minimum image background, diffusion suppression takes place of the drusen disease in the disc of optics retina. This image gets blurred by using gaussian blurring method of less kernel size. This algorithm is used to maintain the continual process in the vessel tree for broken pieces. This blurred image is given as an input to the log filter of a certain kernel size. This final image is processed with contrast enhanced and reversed technique with vessel trees and it should be prominent one. This image has a uniform background image. This image consists of noise component when compared with the vessel tree contrast component, in turn the noise component will also be increased. The vessels boundaries now look like a bright boundary with dark edges due to applying the concept of contrast reversal technique. It is an exact feature appears due to the log filter appliance. The significance of log filter gives the uniform background intensity image. This feature resembles like homomorphic filtered image feature. The image consists of higher intensity and maintains uniform intensity and is to be processed for OTSU’s optimum thresholding. The filtered image is converted into binary image. This binary

image has the noise component. The noisy images consist of more noise components and small noise components of a OTSUs images. The noise component in the binary image is eliminated using a length filtering method. The proposed algorithm window size can vary from four to sixteen. Pixel values can be added together in the boundary of the window. Whenever the pixel values are zero, then the corresponding pixels are eliminated. The final image consists only vessel tree structure

Basic functionalities:

Modules

1.Admin

- Add& manage Doctor
- Schedule doctor
- Accept& reject bookings
- Add& manage lab
- View Patients
- View complaint& send reply
- View rating

2.Doctor

- View schedule
- View Patient(scheduled patient)
- View patient information(records)
- Add records
- Add test request
- View test result

3.Patient

- Registration
- View doctor
- View schedule
- Add booking request
- View booking state
- View lab schedule
- View records
- View test results
- Send complaint &view reply

- Send rating

4.Lab

- View request
- Schedule appointment
- Upload reports

Work flow

A retina image is convolved with gaussian large blurring kernel to extract the blood vessels. The blurred image contains only the illumination pattern and other patterns get lost. If the Gaussian blurred image is obtained from the retinal fundus image, the other image can be formed in two stages. The final image is the miniature of two images. The intensity in the lower range only is illuminated in a blood vessels of retinal fundus image. The blood vessels are having the lowest values with increased edges when compared to the background in a minimum image. In the minimum image background, diffusion suppression takes place of the drusen disease in the disc of optics retina. This image gets blurred by using gaussian blurring method of less kernel size. This algorithm is used to maintain the continual process in the vessel tree for broken pieces. This blurred image is given as an input to the log filter of a certain kernel size. This final image is processed with contrast enhanced and reversed technique with vessel trees and it should be prominent one. This image has a uniform background image. This image consists of noise component when compared with the vessel tree contrast component, in turn the noise component will also be increased.. The significance of log filter gives the uniform background intensity image. This feature resembles like homomorphic filtered image feature. The image consists of higher intensity and maintains uniform intensity and is to be processed for OTSU's optimum thresholding. The filtered image is converted into binary image. This binary image has the noise component. The noisy images consist of more noise components and small noise components of a OTSUs images. Figure explains the process involved in EEED method

Tools / Platform, Hardware and Software Requirements:

Software Requirements

One of the most difficult task is selecting software for the system, once the system requirements is found out then we have to determine whether a particular software package fits for those system requirements. The application requirement:

- OPERATING SYSTEM: WINDOWS 10
- FRONT END: HTML, CSS, JAVASCRIPT
- BACK END: Mysql
- SOFTWARES USED: Jetbrains Pycharm, Android Studio
- TECHNOLOGY USED: PYTHON,JAVA
- FRAME WORK USED: Flask

Hardware Requirements

The selection of hardware is very important in the existence and proper working of any software. Then selection hardware, the size and capacity requirements are also important.

- Processor : 64 bit
- RAM: Min 3 GB
- Hard Disk: 10 GB