

# Detection of Glaucoma Using Thresholding Technique

Dr.K.A.Dattatreya<sup>1</sup>, S.Kavitha<sup>2</sup>, N.Sunitha<sup>3</sup>, S.Preetha Devi<sup>4</sup>

Professor, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India <sup>1</sup>

U.G Student, Department of ECE, Adhiyamaan College of Engineering, Hosur, Tamilnadu, India <sup>2,3,4</sup>

**ABSTRACT:** Glaucoma is an eye defect that threatens the eyesight of the patients. It can be estimated by observing intraocular pressure and cup to slab quota. The existing methodology signifies the detection of CDR in which the error is more. The proposed method benefits a thresholding technique for segmenting optic cup and optic slab. This method detects glaucoma automatically with the identical CDR quota. The images are acquired from DRIONS database which contains 110 fundus images.

**KEYWORDS:** Image acquisition, Image pre-processing, Thresholding, Optic cup, and disc segmentation

## I. INTRODUCTION

Glaucoma is a dangerous disease that damages the eye's optic courage. This damage is often caused by abnormally high strain in the eye. As the pressure increases, it leads to vision loss. Thresholding approach is a compelling segmentation innovation that isolates the article by remodel grey scale images into binary picture. The input to a thresholding action is consistently a grey scale image. The manufacturing is a binary icon. Black pixels are considered as background and white pixels are treated as foreground. Many category of thresholding arrangement are available. Automatic thresholding is an extreme way to excerpt favourable material in a figure.

## II. RELATED WORK

The main objective of this project is to increase accuracy and to reduce the processing time. Fig 1 shows the flowchart and is summarized as follows.

1. Image recovery in image processing can be generally described as the arrangement of fetch an image from some source, customarily a hardware-based origin. Image recovery is the opening in image transform operation. The images are captured from the database for processing.
2. The image Pre-processing is the next step. The ambition of pre-processing is a gain of the image data that overcome unwilling distortions or enhances some image features important for further processing. In this stage, the organization found with image enhancement which desire to promote the interpretability or sensitivity of instruction included in them to contribute exceptional absorption for other prioritize image processing way.
3. In thresholding, the threshold value is set to an image, if the value which exceeds the fixed threshold value becomes white and if it is less than or equal to a fixed threshold value, the region will become black. Then the optic cup and slab are segmented by fixing the proper threshold value.
4. The value of CDR indicates whether the person is affected by glaucoma or not. It is the quota of the opticcup to the optic slab. Using segmented cup and disc regions, the area of the cup and the slab can be calculated. The quota of the radius of the cup and slab defines the CDR value.

$$CDR = \text{Area of Cup}/\text{Area of slab}$$

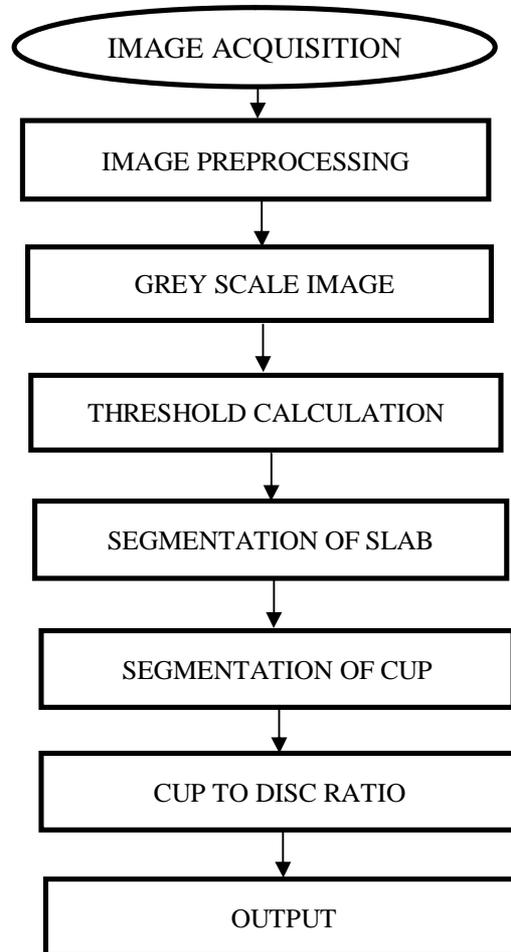


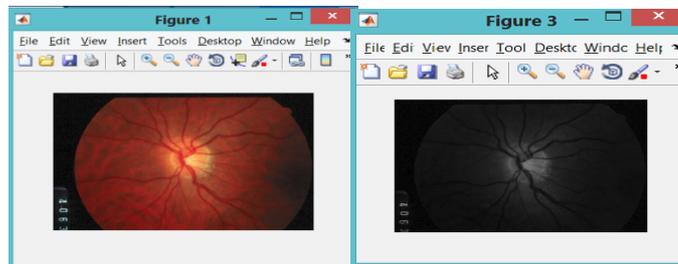
Fig 2.1 Flow chart

The Advantages of the proposed method are

- This algorithm reduces the processing time of glaucoma detection.
- It detects Glaucoma automatically with exact CDR value

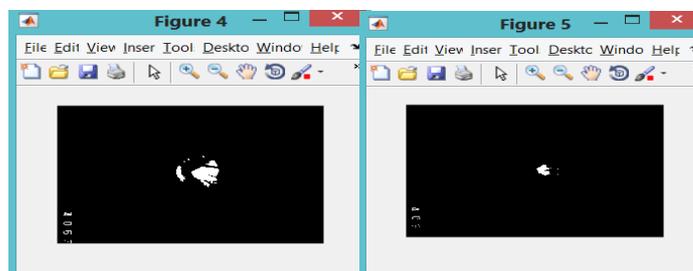
## II. EXPERIMENTAL RESULTS

The below figures shows the results of our activity. Fig 2 represents the acquired image or input image. The input image pre-processed and then it is converted to grey scale image. Fig 3 represents the grey scale image. Fig 4 shows segmented cup and Fig 5 illustrates segmented slab. Thereby the cup to slab quota was calculated. The CDR was calculated by finding the radius of the cup and slab. We obtained the conclusion as 0.3. If the CDR is greater than 0.3, then it is said to be glaucomatous and CDR less than or comparable to 0.3, it is said to be a normal image. The CDR value determines the eye condition.



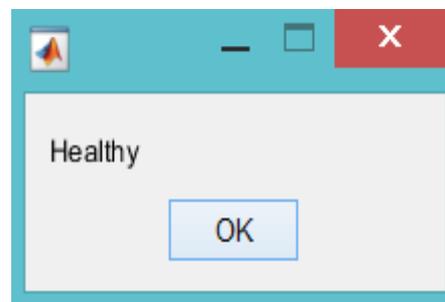
*Fig 3.1 Input image*

*Fig 3.2 grey scale image*



*Fig 3.3 Segmented disc*

*Fig 3.4 Segmented cup*



*Fig 3.5 Output*

### III. CONCLUSION

The investigation of Glaucoma can be done up a quota of the cup to slab ratio, illustrate as the ratio of the steep extent of the optic cup to the steep extent of the optic slab. The essential cup to slab quota spectrum is from 0.1 to 0.3. If the cup to slab scale overtakes 0.3 then it demonstrates the irregular action that is the existence of glaucoma.

### REFERENCES

- [1] U.RajendraAcharya(2011) 'Automated Diagnosis of Glaucoma Using Texture and Higher Order Spectra Features', Ieee Transactions On Information Technology In Biomedicine, Vol.,15, No.3.
- [2] Fengshou Yin (2012)'Automated Segmentation of Optic Disc and Optic Cup in Fundus Images for Glaucoma Diagnosis'1. Institute for Infocomm Research, A\*STAR, Singapore2. Singapore Eye Research Institute, Singapore .
- [3] Jiang Liu (2013) 'Superpixel Classification Based Optic Disc and Optic Cup Segmentation for Glaucoma Screening' IEEE Transactions On Medical Imaging, Vol. 32, No. 6, June 2013 1019.
- [4] Damon Wing Kee Wong (2015) 'Sparse Dissimilarity-Constrained Coding for Glaucoma Screening' IEEE Transactions On Biomedical Engineering, Vol. 62, No. 5, May 2015 1395.
- [5] Jun Cheng (2010)'Closed Angle Glaucoma Detection in RetCam Images'32nd Annual International Conference of the IEEE EMBS Buenos Aires, Argentina.
- [6] Yuji Hatanaka (2012) 'Glaucoma Risk Assessment Based on Clinical Data andAutomated Nerve Fiber Layer Defects Detection' 34th Annual International Conference of the IEEE EMBS San Diego, California USA.

- [7] SiamakYousefi (2014) 'Learning From Data: Recognizing Glaucomatous Defect Patterns and Detecting Progression From Visual Field Measurements' IEEE Transactions On Biomedical Engineering, Vol. 61, No. 7.
- [8] GopalDatt Joshi (2011) 'Optic Disk and Cup Segmentation from Monocular color retinal images for glaucoma assessment' IEEE Transaction On Medical Imaging Vol. 30, No. 6.
- [9] Soe Ni Ni (2014) had proposed 'Angle Closure Glaucoma Detection using Fractal Dimension Index on (SS-OCT ) images' IEEE Transaction On Medical Imaging .
- [10] Boston, Massachusetts USA, August 30 - September 3, Jiang Liu (2011) 'Focal Edge Association to Glaucoma Diagnosis' 3rd Annual International Conference of the IEEE EMBS.