



Finding Retinoblastoma Cancer Using Image Processing

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Abstract- Retinoblastoma (Rb) is a rare form of cancer that rapidly develops from the immature cells of a retina, the light-detecting tissue of the eye considered in the evaluation of leukocoria is a white pupillary reflex is an abnormal white reflection from the retina of the eye. For the detection of retinoblastoma cancer i.e. automatic detection of immature cells of a retina by using image processing algorithm by detecting the white radius of an retina using power law, median filtering and wavelet transform by applying different thresholding algorithm.

Keywords: median filtering, thresholding, leukocoria, iris, power law transformation.

I. INTRODUCTION

Leukocoria is an abnormal white reflection from the retina of the eye. Leukocoria resembles eyeshine, but leukocoria can occur in humans and other animals that lack eyeshine because their retina lacks a tapetum lucidum.

Leukocoria is a medical sign having various signs like Coats disease, congenital cataract, corneal scarring, melanoma of the ciliary body, Norrie disease, ocular toxocariasis, , retinoblastoma, andretrolental fibroplasia.

Retinoblastoma (Rb) is a rare form of cancer that rapidly develops from the immature cells of a retina, the light-detecting tissue of the eye. It is the most common malignant cancer of the eye in children, and it is almost always found in young children

Retinoblastoma is the life threatening nature of having cancer which is used for the evaluation of leukocoria caused by coat's disease.

This paper proposes an algorithm based on image processing for the detection of immature cells of the eye to identify the light white portion of an eye by applying power law transformation for the image enhancement and then apply median filtering to remove any type of noise in the image and finally the last approach is to apply wavelet haar transform followed by various thresholding schemes.

II. TECHNIQUES USED FOR IMAGE PROCESSING

Image processing helps to convert RGB image into digital image and also after some operations performed on it to enhanced the image and extract the useful information from that image.

To extract a useful information various operations performed on it

- With the help of digital photography or camera import the image
- Analyze that image by converting the image and apply various operations like removing noise and apply wavelet transform with thresholding.
- Last is the extracted information i.e. output.

III. METHODOLOGY

Below algorithm shows the sequence of operations to be performed to extract the information about the problem in the eye like preprocessing, filtering, thresholding etc.

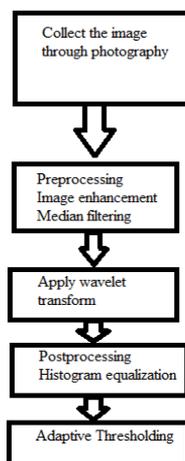


Fig1: Shows the flowchart

a) Preprocessing

Preprocessing of retinoblastoma cancer is done by converting rgb image into gray scale image and then preprocessing is done by reducing the noises and enhance the image to improve the image quality. Steps are as followed:

- convert Image into gray scale
- enhance the image by applying power law transformation
- 3×3 median filter is applied on the image to reduce the any type of noise for improving the image quality.

b) Wavelet Transform:

This transform is most appropriate for non stationary signals. Haar wavelet transform is used. Following steps are:

- Divide that information into approximated and detailed information
- Apply low pass and high pass filter on both the information
- Get various details of the images

c) Post processing

After wavelet transform several other operations are performed to enhance the eye image i.e. histogram equalization

d) Thresholding

Finally adaptive thresholding is applied to distinguish between eye is cancerous or not.

IV. RESULTS

After applying various techniques the results are as follows:

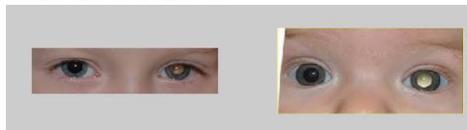


Fig2: Digital photography



Fig3: Gray scale conversion



Fig 4: Enhanced Image

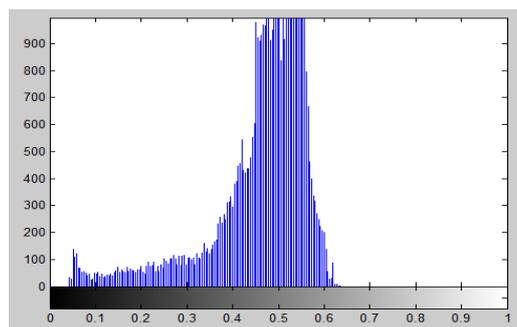


Fig 5: Adaptive histogram of the image

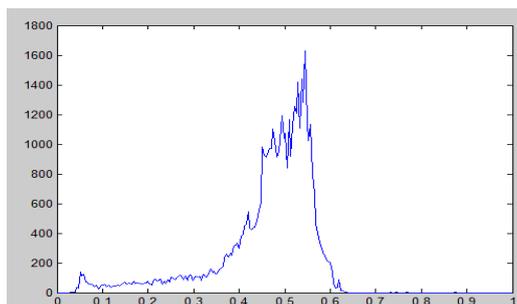


Fig 6: polynomial count



Fig 7: Different thresholding applied on the image information

V. CONCLUSION

This research proposed to find the variation in the stem cells of the eye. This is also used for various types of images having different sizes of retina and opening of an eye. Using median filter with wavelet transform gives the better result.

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