

Automated Detection of Glaucoma From Digital Retinal Images



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Abstract

Glaucoma is a common eye problem in aging. It is caused by increasing pressure in eye. The pressure increases due to improper exchange of fluid in anterior chamber of the eye that causes death of ganglion cells if it remains untreated than it will lead to patient's vision loss. Mostly, patient of glaucoma do not know that they have glaucoma unless it reaches its advance stage. So it is necessary to design Computer Aided System that detects glaucoma in its early stage. Fundus image analysis is an important tool for Glaucoma detection. We have designed a computer aided system that detects glaucoma from colour fundus images. Our proposed System includes four stages i.e vessel segmentation, optic disc detection, extraction of cup and disc and lastly measure of cup to disc ratio. First of all bright spots are extracted and then vessels are tracked to check which spot have maximum intensity so that region is mark as optic disc. After detecting optic disc, region of interest have been cropped and then by using thresholding and morphological operations, optic disc and cup have been extracted. Finally, ratio between cup and disc is measured. If this ratio is greater than 0.5 than image have glaucoma otherwise it is normal image. We have used four publicaly available databases that are MESSIDOR, DMED, DRIONS and AFIO dataset. We have tested the disc detection on Messidor database and achieved the accuracy of 99% whereas tested the glaucoma on 50 images taken from above mentioned databases and achieved accuracy of 94%.

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