Automatic Detection of Glaucoma in Retinal Fundus Images through Image Processing and Data Mining Techniques

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Abstract

Computational techniques are highly used in medical image analysis to aid the medical professionals. Glaucoma is a sight threatening retinal disease that needs attention at its early stages, though it does not reveal any symptoms. Glaucoma is identified usually through cup to disc ratio and ISNT rule. This work involves segmentation of blood vessels, segmentation of optic disc through proposed maximum voting of three segmentation algorithms (K-Means, Wavelet and Histogram based), segmentation of optic cup through intensity thresholding, feature extraction from these segmented structures, feature selection to identify significant features, hybrid model involving Naive Bayes to remove noise in data followed by ensemble classification of Reduced Error Pruning Tree. Optic disc segmentation methodology attains an average accuracy of 99.33%. Glaucoma detection accuracy reaches a maximum of 96.42%.

References


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**Index Terms**

Computer Science  
Image Processing

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**Keywords**

Glaucoma, Retina, Fundus Image, Optic disc, Maximum voting, hybrid classification