DETECTION OF OPTIC DISC FROM DIGITAL FUNDUS IMAGES OF RETINA USING BOTTOM-HAT TRANSFORM AS PREPROCESSING FOR GLAUCOMA DETECTION

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ABSTRACT

Automated retinal image analysis is emerging as an important screening tool for early detection of eye disease. In this automated analysis some factors need to be considered in order to get better analytical results. We present in this paper methodology to extract exact boundary of OD in digital retinal fundus images. The method starts with preprocessing of digital fundus images by contrast normalization throughout the image, and removal of blood vessels which is major reason for distraction of finding OD candidate. Further processing is followed by detecting pixel located in OD by three different methods: Maximum difference method, Maximum Variance method & Low Pass filter method. Exact pixel location within OD among the three positions is estimated by Voting type algorithm. Using this point/pixel as seed point during segmentation procedure we extract exact boundary of optic disc using morphological methodology and edge detection techniques followed by circular Hough Transform. The proposed method was evaluated using MESSIDOR data set containing 100 digital fundus images of retina. This method succeeded in 94% of cases of MESSIDOR.

KEYWORDS: Bottom Hat Transform (BHT), Diabetic Retinopathy (DR), Hough Transform, Location Methods, Optic Disc (OD), Segmentation