Abstract

One of the major symptoms of many blood related diseases like diabetes or cardiovascular disease is the change in blood vessel features. These diseases can be detected by analyzing features of retinal vessels and proper treatment can be provided to patient in early stages of disease. Cost associated in detecting these changes and inconsistency in the detection procedure led to the automation of this process. Among other tasks, retinal blood vessel segmentation is the foremost and very challenging task from which various features are analyzed to detect the disease. In this paper, an effective blood vessel segmentation method from coloured retinal fundus images is presented. Segmentation is done by extracting the green channel from RGB retinal image. Firstly the vessel structure is estimated using morphological operations and then noise is removed using Rician Denoise method. After removing the noise, segmentation of blood vessels is carried out using thresholding method. Segmented image needs to be post-processed before considering it for examining any disease. Proposed segmentation method was evaluated on two publicly available DRIVE and STARE datasets. Segmentation process achieves high level of accuracy than most of the previous techniques.
Further, results have demonstrated that the proposed method is applicable for segmenting retinal vessels and taking measurements from it. Advantages of this method are its simplicity, fast segmentation process, high efficiency and scalability to deal with coloured retinal images of high resolution.

References


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An Enhanced Segmentation Technique for Blood Vessel in Retinal Images


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Index Terms

Computer Science

Image Processing
Keywords

Blood Vessel Segmentation; Diabetic Retinopathy; Medical Retinal Imaging.