Detection of Diabetic Retinopathy from Retinal Fundus Image using Wavelet based Image Segmentation

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Authors:
Rajalaxmi Sahoo, Chandra Sekhar Panda

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Abstract

In case of Diabetic Retinopathy, retina is damaged because of fluid leaks from blood vessels into the retina. According to ophthalmologists, some basic features are there to recognize diabetic retinopathy, such as blood vessel area, exudates, hemorrhages, micro-aneurysms and texture. Presence of exudates within the macular region is a main hallmark of diabetic which identifies its detection with a high sensitivity. Hence, detection of exudates is an important diagnostic task that can be determined by means of morphological techniques for better result. Here image segmentation has done to detect Diabetic Retinopathy by extracting exudate from retinal fundus images. Here the final extracted exudates contained the boundaries of proper segmented regions which can identify the severity of disease. Using Wavelet Transform decomposition method and morphological operations the feature like exudate is possible to extract from retinal fundus image to detect Diabetic Retinopathy. Here 4 datasets have been taken such as STARE, DRIVE, DIARETDB1 and DIARETDB0 for extraction of exudate from retinal image in which the proposed method obtained an average value of accuracy at 95.72%, sensitivity at 95.87% and specificity at 96.2% respectively.
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Index Terms

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Keywords

Diabetic Retinopathy, Wavelet Transform, Exudates, STARE, DRIVE, DIARETDB1 and DIARETDB0.