Automatic Diagnosis of Diabetic Retinopathy Micro aneurysm from Low Contrast Retinal Images using Mathematical Morphology Methods

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Abstract

Diabetic retinopathy is a disease of the retina, occurring in about a quarter of people with diabetes. The retina contains cells that convert the light into the electric signals, and these signals are then sent on to the brain. The symptoms can blur or distort the patient's vision and are a major cause of blindness. Microaneurysms are one of the primary signs of retinopathy. Detection of exudates by ophthalmologists normally requires pupil dilation using a morphological method which takes time and affects patients. The leakage causes the retina to swell up a little and become waterlogged, a bit like a sponge. This swelling then damages the retinal cells themselves. This paper examines and proposes a set of optimally adjusted morphological operators to be used for Microaneurysm detection on diabetic retinopathy low-contrast images. Automatic tool for diagnosis of diabetic retinopathy must go through some well-defined steps. First, it has to detect the blood vessels and optic disc. Second, it has to identify abnormalities in the retina like exudates and microaneurysms that cause diabetic retinopathy. This method has resulted with sensitivity and specificity for our Microaneurysm...
detection is 80% and 99.5%, respectively.

References

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Index Terms

Computer Science

Image Processing

Keywords

Diabetic retinopathy; Microaneurysm; Morphology operator; Retinal image; Non-dilated retinal images.