Identification of Diabetic Retinopathy Stages using Fuzzy C-means Classifier

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Abstract

Diabetic Retinopathy (DR) is globally the primary cause of visual impairment and blindness in diabetic patients. Diabetic retinopathy occurs when the small blood vessels have a high level of glucose in the retina. That causes a change in the retina, which occur over a period of time in diabetics and cause the difficulties with vision. Regular screening is essential in order to detect the early stages of diabetic retinopathy for timely treatment to prevent or delay further deterioration. In this paper, the presences of abnormalities in the retina such as the structure of blood vessels, microaneurysms, and exudates using image processing techniques are detected. These features are processed with the help of Fuzzy C-Means clustering algorithm to detect the different diabetic retinopathy stages. This system intends to help ophthalmologists in DR screening process to detect symptoms faster and more easily. The sensitivity, Precision and accuracy for that Diabetic Retinopathy detection system are 98.01%, 99%, and 97% respectively.

References


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Diabetic retinopathy (DR) microaneurysms exudates and Fuzzy C-Means (FCM) Retinal Image (RI).