Abstract

Diabetic retinopathy is a severe and widespread eye disease that affects many diabetic patients and it remains one of the leading causes of blindness. Usually diabetic retinopathy is
asymptomatic in the premature phase and intensifies as it grows. Hence, routine screening is essential to reduce the further complication to a significant level. In this paper, a state-of-art image processing techniques to automatically detect the occurrence of hard exudates in the fundus images are discussed. After the adaptive contrast enhancement as preprocessing stage, fuzzy C-means algorithm has been applied to extort the same. The standard deviation, intensity, edge strength and compactness of the extracted features of the fundus images have been fed as an inputs into a recurrent Echo state neural network to classify the extracted features as true candidate or not. A total of 50 images have been used to find the exudates and out of which 35 images consisting of both normal and abnormal are utilized to train the neural network and obtain 93% sensitivity and 100 % specificity.

Reference

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**Index Terms**

- Computer Science
- Biomedical

**Key words**

- Diabetic Retinopathy
- Hard exudates
- Fuzzy
- C-Means
- ESNN