

Automatic Detection and Classification of Diabetic Retinopathy Using Retinal Fundus Images

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Abstract : Diabetic Retinopathy (DR) is a severe retinal disease which is caused by diabetes mellitus. It leads to blindness when it progress to proliferative level. Early indications of DR are the appearance of microaneurysms, hemorrhages and hard exudates. In this paper, an automatic algorithm for detection of DR has been proposed. The algorithm is based on combination of several image processing techniques including Circular Hough Transform (CHT), Contrast Limited Adaptive Histogram Equalization (CLAHE), Gabor filter and thresholding. Also, Support Vector Machine (SVM) Classifier is used to classify retinal images to normal or abnormal cases including non-proliferative or proliferative DR. The proposed method has been tested on images selected from Structured Analysis of the Retinal (STARE) database using MATLAB code. The method is perfectly able to detect DR. The sensitivity specificity and accuracy of this approach are 90%, 87.5%, and 91.4% respectively.

Keywords : diabetic retinopathy, fundus images, STARE, Gabor filter, support vector machine

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