A system for Classification of Diabetic Retinopathy

by

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Abstract

Medical image analysis is very popular research area these days in which digital images are analyzed for the diagnosis and screening of different medical problems. Diabetic retinopathy (DR) is an eye disease caused by the increase of insulin in blood and may cause blindness. An automated system for early detection of DR can save patient's vision and can also help the ophthalmologists in screening of DR. In this project, we develop algorithms for detection of DR and its different lesions such as Microaneurysms (MAs), Haemorrhage (H), Hard Exudates (HE) and Cotton wool spots (CWS). The project consists of three stages i.e. preprocessing, feature extraction and finally the classification. In preprocessing, it segments out the background, noise, blood vessels and optic disk (OD). We use Gabor filter bank for extraction of candidate lesions and then we form feature set for each lesion consisting of color, gray level, shape and statistical features. Finally, the classifier takes the feature sets as input and classifies them as MAs, H, HE or CWS. The implemented algorithms are tested on publicly available databases of retinal images and are evaluated using performance parameters such as sensitivity, specificity and accuracy. We have compared our algorithms with already proposed and published methods. This project will help the ophthalmologists in saving their time and can be applied as an application of tele-medicine system.

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