Conference Abstract

Automated diagnosis of maculopathy stages using texture features

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Abstract

Objective: Diabetic maculopathy is the main cause of visual loss in diabetic subjects. It affects the central vision from the early stage of diabetic retinopathy (DR). Regular eye screening of diabetes patients helps to detect the maculopathy at early stage and hence prevent the loss of vision. Manual screening of retinal images by ophthalmologists is time consuming, tedious and may cause inter/intra observer variability. Objective of our study is to develop an automated system to classify retinal fundus images into normal, non-clinically significant macular edema (NCSME) and clinically significant macular edema (CSME) classes.

Methods: The normal and DR images has various granular structures at different scale termed as ''texture''. In this work, texture features are extracted from the image. The statistically significant features are then fed to Fuzzy-Sugeno (FS) classifier for automated diagnosis.

Results: The proposed technique is validated using 300 images, 100 images of each normal, NCSME and CSME. We have obtained the best results using FS classifier with accuracy of 86.67%, sensitivity and specificity of 100%, and specificity of 100%.

Conclusion: This proposed automated system can aid clinicians in cross checking their diagnosis of diabetic maculopathy during the mass screening of DR subjects.

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Keywords:

diabetic maculopathy, texture, computer aided diagnosis, fuzzy classifier

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