

Universiti Teknologi MARA

**Diabetic Retinopathy Detection
Using Grey Level Co-Occurrence Matrix**

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ABSTRACT

Diabetic Retinopathy (DR) ranks top among Ophthalmologists that lead to blindness in people with diabetes. DR is a major eye disease that generally found in working-age individuals with diabetes and whose sugar levels are not controlled. As a result, early discovery through regular screening will help manage the disease's progression. However, because the number of people affected by the disease far outnumbers the number of Ophthalmologists who can screen them, an automated DR detection system is required to expedite the work of the Ophthalmologists. Hence, this project aims to develop an automated DR detection prototype to help primary care doctors detect the disease and reduce the number of reviews required by Ophthalmologists. To achieve this, the Gray-Level Co-Occurrence Matrix (GLCM) is used to extract features from fundus images of patients. The algorithm detects microaneurysms, exudates, and blood vessels from the images. The classification was performed by using Support Vector Machine (SVM) to generate the cross-validation accuracy to determine the learning algorithm's performance. A set of 30 fundus images containing 15 normal and 15 DR fundus images was used for automation testing using SVM as models to generate the confusion matrix and performance accuracy. The automated DR detection prototype yielded 90% accuracy for the detection of DR when tested on a public database of fundus images. Therefore, it could be a useful tool for DR detection screening in remote rural areas without access to ophthalmologists.

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