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## NUSYS'18

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# Automatic Detection of Diabetic Retinopathy Retinal Images Using Artificial Neural Network



Syamimi Mardiah Shaharum, Nurul Hajar Hashim,  
Nurhafizah Abu Talip @ Yusof, Mohamad Shaiful Abdul Karim  
and Ahmad Afif Mohd Faudzi

**Abstract** The Diabetic Retinopathy (DR) is a critical vascular disorder that can cause a permanent blindness. Thus, the early recognition and the treatment are required to avoid major vision loss. Nowadays manual screening is done however, they are very incompetent to large image database of patients and most importantly they are very time consuming. Besides, it required skilled professionals for the diagnosis. Automatic DR diagnosis systems can be as an optional method to the manual methods as they can significantly reduce the manual screening process labor. Screening conducted over a larger population can become effective if the system can distinguish between normal and abnormal cases, as a replacement for the manual examination of all images. Hence, the development of an Automated Diabetic Retinopathy detection systems has been recognized in the current times. This study has successfully developed an automated detection system for proliferative diabetic retinopathy symptoms using an artificial neural network with two types of feature used; mean of pixel and area of the pixel. The highest accuracy of this system is 90% with 30 hidden neurons in the neural network trained for all features. The results clearly show that the proposed method is effective for detection of Diabetic Retinopathy.

**Keywords** Diabetic retinopathy · Artificial neural network · Automated detection

## 1 Introduction

The Diabetic Retinopathy (DR) is a critical vascular disorder that might lead to complete blindness. Diabetic retinopathy is one of the devastating significances of diabetes that damage the blood vessels that supply and nourish the retina which leads

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