

ABSTRACT

Diabetes retinopathy is signaled by the appearance of vascular disorder in the retina with the form of leakage which eventually flows through the eye cavity and triggers the retina causing a blurred vision and able to develop into blindness if left untreated. Examination of patients with this kind of illness is carried out using a direct observation by the doctor through a fundus photo. But it takes 3-7 days to get the final diagnostic result which categorized as a weakness of this method. In the cause of that, a system that can help a DR diagnostic process to be faster and accurate is needed.

Based on the problem, a design for DR diagnostic system is arranged. The system carried out through a digital image processing. In this system design, the disease is being classified by the severity of the illness. The illness severity itself is being categorized into 4 classes such as normal, mild NPDR, moderate NPDR, and severe NPDR. The data obtained is in the form of secondary data from Messidor with the amount of 200 data and being divided into 120 training data and 80 eval data.

Based on the result of the system evaluation which engaged 2nd orde of statistical feature extraction with 4 parameters being applied (angular second moment, contrast, correlation, and energy), also artificial neural network (ANN) as the image classification method, a result that capable to indicate system performance are being obtained. The best system performance can reach 90,24% accuracy for 40,85 second computation time with the condition of 0 deviation and by applying 3 features combined (angular second moments, contrast, and correlation), also with the epoch value = 100 and hidden layer = 1000. In conclusion for the mean time, this system design can be used for DR system detection with faster time duration.

Keyword:DR, Second orde statistical feature extraction, ANN