

ABSTRACT

Diabetic Retinopathy is a disease of the retina of the eye caused by complications of diabetes. Advanced diabetic retinopathy can lead to blindness. The ability of human vision can be affected by disease attacks, one of which is caused by abnormalities in the eye, namely the retina. This disorder can be caused by disease Non-Proliferative Diabetic Retinopathy (NPDR), NPDR is a disease of the retina of the eye caused by complications of diabetes. Most people with diabetic retinopathy in the early stages do not feel the symptoms of visual disturbances, which causes delay in diagnosis in the treatment of this disease. Examinations to detect and classify the severity of diabetic retinopathy sufferers are currently carried out by trained medical personnel manually and require a relatively long time, so they are considered less effective and efficient. Therefore, a system is created that can be used to detect the disease in a safer way through iris images in a short time, making it more effective and efficient.

This final project aims to create a program that can be used to detect Non-Proliferative Diabetic Retinopathy (NPDR) through iris images. The NPDR classification is divided into 3 classes, namely Mild NPDR, Moderate NPDR, and Severe NPDR. The eye data images used in this study were obtained from Messidor as many as 80 training images and 40 test images. The image processing process consists of 4 stages, namely image acquisition then followed by the preprocessing stage, then the next stage namely feature extraction, and the last stage is classification. In this study, Fractals were used as a method for feature extraction, and Artificial Neural Networks (ANN) were used as classification.

From the test results, the system was built capable of detecting NPDR through iris images and classifying into four classes with the highest accuracy rate of 95 % and an average computing time of 0.1204 seconds when resize size 1024×1024 and fractal dimensions 16.

Keywords: Non-Proliferative Diabetic Retinopathy (NPDR), Fractal, Artificial Neural Network (ANN).