ABSTRACT

Diabetic retinopathy is a microvascular complication in the retina of the eye in people with diabetes mellitus. If not treated, this disease can result in blindness. Diabetic retinopathy has three types according to the severity of the sufferer, namely normal, non-proliferative (NPDR), and proliferative (PDR). The process of detection and classification of the severity of diabetic retinopathy patients is still done manually by trained medical personnel. Along with the development of the technology field, it allows the development of a system that can classify the severity of diabetic retinopathy.

In this final project, a system of classification of the severity of diabetic retinopathy is designed based on fundus images with digital image processing. The classification is divided into five classes of severity, namely normal, non-proliferative (mild, moderate, and severe), and proliferative, wich is equally divided into 60 training data and 40 test data. The method used for feature extraction is Gabor Wavelet and Artificial Neural Network (ANN) Backpropagation as a classification algorithm.

Based on the tests that have been done, the best accuracy is obtained at 85% with 60 training data. The best parameters using resize images with 512x512 resolution, blue canal image, first order parameter feature variance and entropy, downsampling $d_1 = 16$ and $d_2 = 16$, with the classification process using 500 pieces of hidden layer neurons; learning rate 0,005; and epoch 1000 times .

Keywords: *Diabetic Retinopathy, NPDR, PDR, Gabor Wavelet, ANN Backpropagation*