ABSTRACT

Diabetic retinopathy is a microvascular complication of the eye's retina found in people with diabetes mellitus. If it persists, it will be the cause of blindness. Diabetic retinopathy has three types according to the sufferer's severity, such as normal, non-proliferative (NPDR), and proliferative (PDR). Detection and classification process of the diabetic retinopathy sufferer's severity is currently performed by trained medical personnel manually. It is inevitable that as technology develops, it may allow the development of a system that can classify this diabetic retinopathy's severity.

This final project, utilizing digital image processing to classify the diabetic retinopathy's severity based on fundus image. This classification is divided into five classes, such as normal, non-proliferative (including mild, moderate, and severe), and proliferative. The method of feature extraction used is Gray Level Co-occurrence Matrix (GLCM) and Artificial Neural Network (ANN) Backpropagation as a classification algorithm.

Based on the tests that have been done, reached the best accuracy amount 86.67% with the number of train data as much as 60 data. The best parameter using the same uncut images, red canal images, 0° offset, that classify by tansig activation function, 200 neurons for hidden layer, learning rate 0.01, *epoch* for 1000 times, and training algorithm using trainlm.

Key words: *Diabetic Retinophaty, NPDR, PDR, ANN Backpropagation*