ABSTRACT

The macula on the retina is responsible for the center of human vision. Optical Coherence Tomography (OCT) is an imaging technique used to detect pathologies that occur in the macula such as Age-related Macular Degeneration (AMD), Choroidal Neovascularization (CNV), and Diabetic Macular Edema (DME). The ophthalmologist takes a long time and tends to be difficult in diagnosing the disease. So, an automatic classification system for general macular retinal pathology is needed based on OCT retinal images to improve time efficiency and accuracy of diagnostic results.

This final project designs an automatic classification system for generalized macular retinal pathology using the Convolutional Neural Network (CNN) model with EfficientNet architecture. The classification system works through several stages starting from inputting OCT image data, the next stage is preprocessing, in this study using three types of preprocessing, namely Gaussian Filter, Contrast Limited Adaptive Histogram Equalization (CLAHE), and Gabor Filter, then from the results of preprocessing data augmentation is performed. After going through the data augmentation stage, the training stage is carried out with two different types of optimizers, namely Adaptive Moment (Adam) and Stochastic Gradient Decent (SGD), and the last stage is to classify image data into four classes, namely Age-related Macular Degeneration (AMD), Choroidal Neovascularization (CNV), and Diabetic Macular Edema (DME).

The results showed that the best configuration for the general classification system of the macula on the retina obtained a test accuracy value of 90.60% with a test loss of 0.27 using CLAHE preprocessing and the Adam optimizer.

***Keywords**: Macular Pathology of the Retina,* Retinal OCT, *Convolutional Neural Network* (CNN), *EfficientNet*