

ABSTRACT

Diabetic Retinopathy is a disease of the retina caused by complications of diabetes, where there is damage to the blood vessels in the retina, causing fluid build-up (exudate) and bleeding in the retina. This condition causes blurred vision, or even blindness. Medical examination to detect diabetic retinopathy requires a relatively long time to be done manually by doctors by observing the fundus images of the patient's retina, but the retinal fundus images cannot provide clear information. Therefore, in this studies a system was designed to detect diabetic retinopathy in an effective and efficient manner.

This Final Task aims to create a system that can detect diabetic retinopathy disease through the image of the retinal fundus. The classification of diabetic retinopathy is divided into 5 classes, namely no DR, mild NPDR, moderate NPDR, severe NPDR, and proliferate DR. The dataset used in this studies used APTOS 2019 Blindness Detection dataset containing 3662 images and augmentation datasets containing 5100 images divided into 75% train data and 25% validation data.

In this studies, an image processing system using Convolutional Neural Network (CNN) was created using EfficientNet-B0 model to train datasets. From the test results, the best model in this studies was to use datasets of augmentation results with AdaMax optimizer, 0.001 learning rate, using 50 epochs with early stopping, and 32 batch size with accuracy of 88.863%, precision value of 89.2%, recall score of 89%, and f-1 score of 88.8%.

Keywords: *Diabetic Retinopathy, Convolutional Neural Network (CNN), EfficientNet.*