

## **ABSTRACT**

Diabetic Retinopathy (DR) is a complication of diabetes mellitus which damages the blood vessel network in the retina. Diabetic retinopathy can cause a person to lose their vision and in severe cases can lead to blindness. Diagnosis of DR with color fundus imagery involves a skilled physician to recognize the presence of lesions on the image which can be used to detect disease properly, so the process is time consuming. This final project aims to create a system that can detect diabetic retinopathy through retinal fundus images in an effective and efficient way.

The image processing system designed is a classification system for diabetic retinopathy using Convolutional Neural Network (CNN) with MobileNet architecture. Classification of diabetic retinopathy is divided into 5 classes, namely no DR, mild NPDR, moderate NPDR, severe NPDR, and proliferate DR. Classification is carried out by means of a training and testing process on the APTOS 2019 Blindness Detection dataset obtained from the kaggle website. This dataset consists of 3.672 images with an unbalanced amount of data for each class. The SMOTE method is used in this final project to overcome the unbalanced amount of data in each of these classes. The final analysis obtained from the designed system produces best performance parameters, which was 92,8% accuracy, 92,8% precision, 92,7% recall and 92,7% f-1 score using Adamax optimizer, learning rate 0,0001 and batch size 8 with 100 epoch iterations.

**Keywords :** Diabetic Retinopathy, Convolutional Neural Network, MobileNet, SMOTE.