

ABSTRACT

Glaucoma is damage to the optic nerve due to increased pressure on the eyeball. The cause is an imbalance between the eyeball fluid (aqueous humor) that is produced with the flow of eyeball fluid (aqueous humor) that is released. Early detection of glaucoma is the first step to reducing the severity of the sufferer. If left untreated, this disease can cause permanent blindness. So we need an automated system to help detect glaucoma early.

This study aims to design a glaucoma classification system on fundus images. Glaucoma is classified into five classes, namely deep, early, moderate, normal, and ocular hypertension (OHT). The dataset used is the RIM-ONE-R1 dataset which contains 169 color fundus images and is augmented into 2000 images, each class consisting of 400 images. Then, the dataset goes through a preprocessing process and model training in which each image will be divided into 80% train data and 20% test data. In the model training process, 5-fold cross-validation is used to select the most optimal model.

The glaucoma classification system in this study uses Convolutional Neural Network (CNN) with MobileNet architecture. The best test parameters used are the epoch value of 100, the value of batch size 8, the learning rate value of 0.0001, and the Adam optimizer. The best parameter test results give an accuracy value of 98.2% with a loss value of 0.051, a precision value of 98.4%, a recall value 98.2% and an f1-score value of 98.2%.

Keywords: Glaucoma, Convolutional Neural Network (CNN), MobileNet.