

ABSTRACT

A cataract is a disease that attacks the eye's lens and makes it difficult to see. Cataracts can occur due to the lens's hydration (addition of fluid) or denaturation of proteins in the lens. If cataracts are not treated properly, they may lead to blindness. Therefore, early detection needs to be done to provide appropriate treatment according to the level of cataract experienced.

This study developed a CNN-based cataract classification system with the GoogLeNet architecture. Fundus images are classified into four classes: normal, Imatur, Matur, and hyperMatur. The data used is a primary dataset collected from several related hospitals. The dataset consists of 399 fundus images and is augmented to 1600 images. Each cataract class consists of 400 augmented images. Then, the dataset goes through a preprocessing process and model training by dividing 80% of the train data and 20% of the test data. The model training process uses the cross-validation method with a 5-fold value to determine the most optimal model.

Cataract classification system using Convolutional Neural Network (CNN) with GoogLeNet architecture. This study obtained the best accuracy at 92,8%, with a loss value of 1,890. The parameters used to achieve the best performance are epoch 50, learning rate 0,0001, Adam optimizer, and batch size 16.

Keywords: Cataract, Convolutional Neural Network (CNN), GoogLeNet.