ABSTRACT

White blood cells, also known as leukocytes, are blood cells that play an important role in the immune system. The function of white cells is to fight virus, fungal, bacterial infections that can pose a risk for the body to be attacked by various diseases, white blood cells will also produce antibodies that can fight foreign substances in the body.

In a previous study related to the classification of white blood cells based on color and shape characteristics with the K-Nearest Neighbor (K-NN) method. From the testing of 100 images tested, the results of the segmentation test showed an accuracy of 78% and a classification test of 64%. Another study, conducting research related to white blood cell classification using the Support Vector Machine (SVM) method based on digital image processing, obtained an accuracy of 72.26% of white blood cell detection in microscope images.

In this study, the classification of white blood cells was carried out, and the types of white blood cells used are neutrophils, eosinophils, monocytes and lymphocytes using the *Convolutional Neural Network* (CNN) method. The architecture used in this research is Alexnet. The results in the best scenario obtained are getting an accuracy value of 89.5%, and for a loss value of 0.6931 with the parameters used are image size 128*128, Adam optimizer, learning rate 0.0001, and epoch 50. The parameters are influence are image size, optimizer, learning rate, and epoch.

Keywords: White blood cells, Classification, Convolutional Neural Network (CNN), Alexnet.