ABSTRACT

White blood cells or leukocytes are cells that make up blood components that function to help the body fight various diseases and as part of the immune system. Classification of white blood cells in medical personnel still uses manual vision with a microscope, this activity requires time and more energy, so it can cause low accuracy results, so a white blood cell classification system is needed.

In this final project, a white blood cell classification system using the Convolutional Neural Network (CNN) will be designed. The CNN architecture consists of 5 constituent layers, namely the convolution layer, Activation Rectified Linear Units, Pooling Layer, fully connected layer and softmax. At the classification stage, the softmax activation function is used to classify white blood cells which are divided into 4 classes, namely Eosinophils, Neutrophils, Lymphocytes and Monocytes.

The number of datasets affects the system performance results in the form of accuracy, precision, recall, and F1-score values. Where in this study the best results were obtained, namely with a total of 2000 datasets, which were divided into 1500 training data and 500 test data. The best system performance, for accuracy, precision, recall, and F1-score are 81%, 82%, 82%, 82% respectively.

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Keyword: White Blood Cells, Convolutional Neural Network.