

ABSTRACT

Anemia is a health problem in the world, especially in developing countries. There are various ways to detect anemia, one of which is to test the level of hemoglobin in the blood. Generally, to detect hemoglobin levels, the examination is carried out invasively by taking a sample of a person's blood. However, as science develops, hemoglobin levels can be measured through alternative non-invasive examinations by looking at the paleness of the conjunctiva of the eye.

This final research project aims to detect anemia conditions through the image of the conjunctiva of the eye by the method of extraction of the characteristic histogram of oriented gradient (HOG) and the classification of decision tree. The image of the conjunctiva first goes through the pre-processing stage. The pre-processing stages are cropping, resize, and color image conversion (RGB) to grayscale. Next is the classification process with the decision tree method.

Based on the test results using HOG and decision trees on 40 testing images, with an image size of 256x128, the best parameters were obtained, namely cell size of 8x8, block size of 8x8, bin numbers of 15, normalization of L2-Hys blocks, entropy criteria, best splitter, random state 10, and minimum impurity decrease of 0.15, the system was able to produce the largest performance of 82.5% with a computing time of 25.63 seconds. Meanwhile, when the comparison classification method is used, namely the logistic regression method with a stochastic gradient descent (SGD) optimizer, the best parameters of cell size of 16x16, block size of 8x8, bin numbers of 11, normalization of L2-Hys blocks, and random state 30, the system is able to produce the largest performance of 92.5% with a computational time of 24.20 seconds.

Key Word: Anemia, Hemoglobin, Conjunctiva, *Histogram of Oriented Gradient* (HOG), *Decision Tree*, Logistics Regression, *Stochastic Gradient Descent* (SGD)