ABSTRACT

Hemoglobin is a protein in red blood cells that functions as an oxygen binding agent and also circulates to all organs and tissues of the human body. Changes in hemoglobin levels, both low and high, can indicate health problems. Checking hemoglobin levels in the human body is usually done medically by taking blood samples that are injuring the patient or often called invasive. Therefore, a non-invasive method is made, which is a monitoring tool for measuring hemoglobin using the K-Nearest Neighbor algorithm based on the Internet of Things.

From the test results it can be seen that the monitoring tool is connected to Cloud ThingSpeak, the prediction process of the algorithm in python programming to the android application that runs well. The input value of Oxygen Saturation (SpO2) is carried out by the KNN algorithm processing where this algorithm is one of the Machine Learning algorithms used to predict an output value so that an average accuracy of 93.481133% at k = 2 is obtained. Delay End-to-End has an average value in the process of sending from monitoring tools to the Android application of 6.8 s. And the average value of throughput on NodeMCU to Cloud ThingSpeak communication is 9.98 Kbps, Cloud - Server - Cloud communication is 13.76 Kbps and communication on Cloud ThingSpeak to Android Application is 11.06 Kbps.

Keyword: *Hemoglobin, SpO2, ThingSpeak, K-Nearest Neighbor Algorithm, Quality of Service, Android.*