

ABSTRACT

Blood sugar measurements are carried out using a glucometer. This tool uses an invasive method which is done by taking a blood sample from the finger using a blood lancet (needle). This non-invasive method can cause pain and swelling. This makes some people, especially the elderly, afraid to check their blood sugar levels. Therefore, an IoT-based Blood Sugar Level Monitoring Prototype was created using the NodeMCU ESP8266 device with a non-invasive method so that someone can check their sugar levels without feeling sore, anywhere and at any time. And to make it easier for users, the prototype will display the measurement results via smartphone. This non-invasive method is implemented using infrared LEDs and photodiodes as reading sensors. The LED and photodiode are placed reflectively or parallel. The reading results in the form of ADC values are then converted to mg/dL values using the nodemcu esp-8266 microcontroller. The highest accuracy value from this research was 94.19% and the lowest was 82.93%. However, in terms of QoS measured, there are only three samples that match with QoS standards. Other samples is approved by TIPHON standards due to delays of more than 450 ms and jitter of more than 225 ms.

Keywords: *Glucometer, NodeMCU ESP8266, smartphone, invasive, non-invasive*