

ABSTRACT

Diabetes Mellitus (DM) is a chronic metabolic disorder that can cause serious complications if uncontrolled. This research aims to develop a non-invasive health condition recommendation system based on the Internet of Things (IoT). This system uses the MAX30102 sensor and ESP8266 microcontroller-based platform to measure heart rate, oxygen saturation, and blood glucose levels. The Tsukamoto fuzzy method is applied to provide health condition recommendations to users. Based on the test results, the system has an accuracy of 95.04% for heart rate measurement, 98.47% for oxygen saturation measurement, and 92.52% for blood glucose measurement with a standard deviation of ± 9.93 mg/dL and a precision of 90.76%. The measurement results and recommendations are displayed on an OLED screen and sent to the Telkom IoT platform using the MQTT protocol with an average packet length of 207.83 bytes. With the ability to perform non-invasive measurements and provide accurate health condition recommendations, this system is expected to help users monitor their health condition and serve as an early warning detector before critical conditions like hypoglycemia or hyperglycemia occur in DM patients. Integration with the IoT platform also allows for remote monitoring and collection of health history data.

Keywords: *DM, Fuzzy Tsukamoto, IoT, MQTT, Non-invasive.*