ABSTRACT

In the current era, we often encounter many wheelchair users around us who suffer from paralysis, either due to accidents or other things. Paralyzed patients are very likely to find it difficult to do anything without the help of others. The reality is that many of them use wheelchairs to facilitate their activities. Due to their weakness and weak joints they are at great risk of falling. It is now important to find out if the chair user had an accidental fall so that he or she can be helped in time. In addition, people who use wheelchairs need to know their health conditions.

For this purpose, this research creates a fall detection system that can simultaneously monitor the patient's health condition, such as monitoring pulse and body temperature. This system uses the MPU-6050 sensor to detect wheelchair movement, which is attached to the user's wheelchair for detection. The sensor is connected to the microcontroller to continuously transmit sensor data. the microcontroller will continue to monitor the resulting value if the tool detects a change in the position of a device. As well as the MAX30102 sensor and MLX90614 sensor, each of which functions as a monitoring of the heart rate and body temperature of wheelchair users. If the system detects the value generated by the sensor exceeds the threshold limit, the microcontroller will send a short telegram message using SIM800l.

The results of the implementation and testing of the accuracy of the sensor readings on the Fall Detection and Health Monitoring System tool, the accuracy value of the heart rate sensor was 96.95% with an average error of 3.05%, the body temperature sensor obtained an accuracy rate of 98.76% with a error of 1.24%. As for the SIM800L module, the success rate of sending warning messages is 100% with an average delay of 5.61 seconds, while for sending data requests, the SIM800L module has an average success rate of 63.3%. Then for the MPU-6050 sensor, the success rate of sending a warning message if the sensor detects a value that has exceeded the specified threshold reaches 100%.

Keywords: *Wheelschair, Microcontroller, MPU-6050, MAX30102, MLX90614, SIM800l.*