

ABSTRACT

Static bicycle exercise is a cardio exercise that is beneficial for physical health and can relieve stress. In this final project, the researcher proposes a system that can monitor speed, average speed, duration, mileage, RPM, cadence, and wasted calories based on the Internet of Things (IoT) with the intelligent stationary bike. The smart stationary bike uses an ESP32 microcontroller as a data processor and two hall effect sensors placed in the frame close to the tire as a speed detector, and the cadence is placed on the crank of a stationary bike. The data obtained from the sensors will be sent to Firebase via Heroku.

The results of the system accuracy test were carried out on the parameters of cadence, speed, distance, and wasted calories. The cadence parameter shows an accuracy of 86.593%. The average velocity parameter shows an accuracy value of 89.305%. The accuracy value for the distance parameter is 99.996%. The accuracy of the calorie consumption parameter is 88.81%. Measurement of Quality of Service in this research consists of throughput, delay, and jitter. Each parameter was tested 30 times at different distances, namely 1 meter, 2 meters, and 3 meters. The test results obtained the best value at 1 meter with an average throughput of 4595.75 Kbps, a delay of 523.62 ms, and jitter of 523.11 ms.

Keywords: Hall effect sensor, speed, ESP32, Internet of Things, Quality of Service (QoS)