

ABSTRACT

In human life cannot be separated from playing games. Many games that can be played ranging from modern games to traditional games. Sack racing is a traditional game that is played by jumping using a sack until it reaches the finish line. Unity3d is one application that is widely used in making games easily. In this study the author will make a waist motion sensor device using the Kalman Filter method, where the sensor will be attached to the waist and can record the user's jump movement. This tool will be implemented in a sack racing game using Unity3d.

The use of Kalman Filter in the design of this system aims to reduce noise in the data so that it can display the appropriate movement. The system design will use the MPU9250 which can capture player movements based on the IMU sensor. In addition, with the use of NodeMCU ESP32 so that it can transmit data wirelessly with Wi-Fi which will later be saved to the Antares webserver so that it can make this tool more practical to use and more comfortable when used in playing games. Meanwhile, in making games in Unity3d it is implemented in TPP (Third Person Perspective) mode and in 1 game it takes 9 jumps from the start point to the finish.

After testing, it was found that the tool can work well to send 598 data with a duration of 5 minutes. The average delay for sending and receiving data is 1 second, for the Arduino local delay and the Antares webserver it is 3.05 seconds. While the jump axis reference obtained the pitch axis with a percentage of 100% and the average upper limit deviation for the pitch of 5.3443 degree.

Keywords: Sack Race, Unity3d, Antares, Kalman Filter, MPU9250, NodeMCU ESP32.