ABSTRACT

Archery is on of many sports that uses the strength of the right arm to pull the string so that arrows can be fired to the target. The high cost of archery equipment kit and a wide space for archery is considered an obstacle today for people who want to try archery. The impact may be to the people who are talented in archery can be hampered to develop their talents in archery. In this final project, a research was to develop a hardware to capture the movement of both arm for use in a virtual archery sport system using fourteen MPU9250 sensors, Multiplexer and ESP32 by using a recursive filter, Kalman Filter is chosen to eliminate the noise at the input data from MPU9250. Later, after being processed by ESP32, the resulting data will be forwarded to PLX-DAQ to logging the data and then forwarded to Blender so can be viewed of arm movements. Based on the test results in this study, it can be concluded that the drift values and standard error regression of each particular test give varying drift values and standard errors. In addition, the motion suitability test can be seen that the movements in the system and in the Blender have similar movements.

Keywords: MPU9250, Kalman Filter, *Motion Detection, Archery*, PLX-DAQ Blender, and ESP32.