

Long Jump Performance Improvement System

Aaron Gearhart, Zerak Haider, Nour Hameedalden, Ramy Hassan, and Nadine Shihadeh

Department of Systems Engineering and Operations Research
George Mason University
Fairfax, VA

Corresponding author's Email: agearha2@gmu.edu

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Abstract: Long jumping is a complex process consisting of several simultaneous biomechanical motions. Boys improve at a rate of 48% and girls 26% from age 11 to 18. Coaches train athletes by providing feedback to athletes via verbal instruction and using video. Neither method is effective. Technological advancements enable wearable sensors that provide athletes with initial velocity and angle at takeoff. The wearable sensor was developed using an Arduino Sten-Slate ESP Kit with an integrated Esp8266 module, a Neo-6M GPS module, an MMA8451 three-axis accelerometer, and a MicroSD card module. Verification drop testing showed the accelerometer having greater than 90% accuracy for all axes when compared to gravity. Furthermore, verification motion testing showed the magnetometer had over 99% accuracy in magnetic heading when compared to true north. Calibration testing will be conducted using four subjects to derive the calibration coefficients and evaluate the values for estimated jump distance and jump height.

Keywords: performance improvement, long jump, wearable, athletes, coaches