IP Proposal
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1 Objectives

- To be able to detect the force exerted by various locations on a person's foot.
- To be able to characterize, based on the force vs time graph, whether a person is standing, walking, running, or jumping.
- To be able to characterize the sport being played based on the force vs time graph.

2 Materials & Methodology

Table 1: Estimated cost of materials.

Quantity	Item	Cost/pc (PhP)	Subtotal (PhP)
1	Pressure-sensitive conductive velostat sheet	349.00	349.00
1	ESP8266 WiFi Microcontroller	325.00	325.00
2	9V Battery	79.00	158.00
		TOTAL	832.00

1. Pieces of the velostat sheet are attached to 3 locations on the insole of a shoe.
2. The velostat is attached to the microcontroller for real-time data acquisition.
3. Voltage vs. force calibration was done by applying different values of force to the velostat sheet.
4. A force vs. time is plotted in real-time for different motions.
5. A characterization of the different motions was done using the frequencies and magnitudes obtained from the force vs. time plot.

3 Predicted Results

Characterization of different motions:

- **Standing** - constant force observed over time
- **Walking** - a cascading motion from the three sensors will be observed
- **Running** - same as walking but with higher frequency
- **Jumping** - two sets of impulse will be observed from the take-off and landing.

4 Validation Scheme

- Compare the obtained force value from the sensor with the calculated calibration equation/curve, for standing motion.
- Through real-time analysis, compare a video of the motions to their force vs. time plot.