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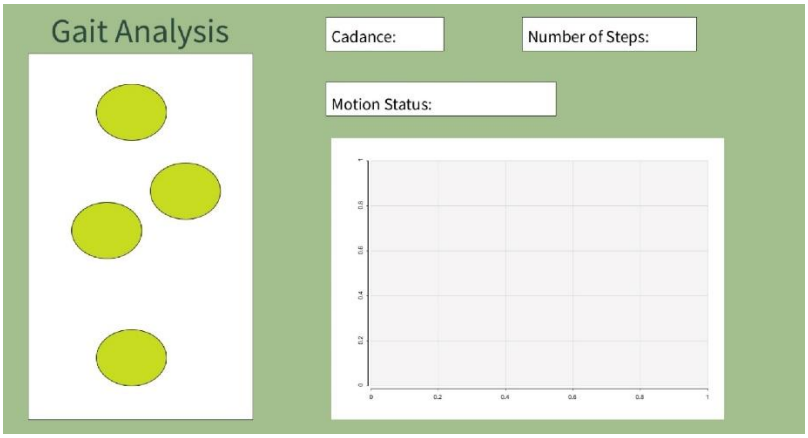
CS 479

Lab 3 - Individual Report

In this lab we are building a smart shoe insole to analyze the gait of users. Gait analysis is a method to evaluate the walking and running profiles of a person and identify pathological gait in case of any biomechanical abnormalities. In order to develop a prototype of the smart shoe insole we need to develop a force pad using Force Sensitive Resistors (FSR). We need to place the FSR sensors at the Medial Forefoot (MF), the Lateral Mid-foot (LF), the Medial Midfoot (MM). Using FSM and 3.3Kohm resistor we will create a voltage divider. Between ground and digital pins we will place 4 LED's. The amount of force exerted on FSR sensors will determine the brightness of LED's. In order to measure the step length and calculate the stride length. We will collect the data from applying pressure to the FSR. For the very first time we have created a user Interface where we applied pressure on all the FSR and generate a Gait analysis.



In Fig1: UI for Gait analysis

When we apply more pressure on Heel, an orangish-Red color is shown as there is more pressure on the heel. We will calculate the Gait analysis of Heel as shown in Fig2.

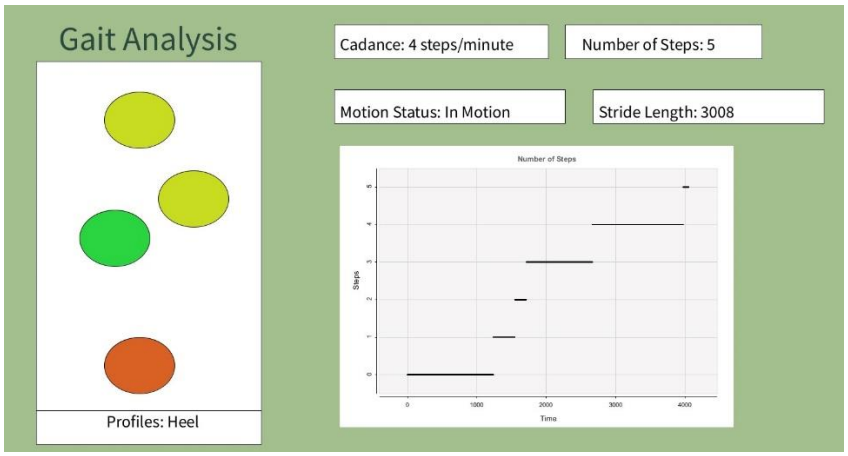


Fig 2: When Motion status is in motion

Similarly, we will apply pressure on the rest of the three FSR to calculate the Medial Force Percentage (MFP) on the different walking profiles. In Fig3 and fig4 will depict the output of the accelerometer includes the orientation along X, Y and Z direction and its acceleration.

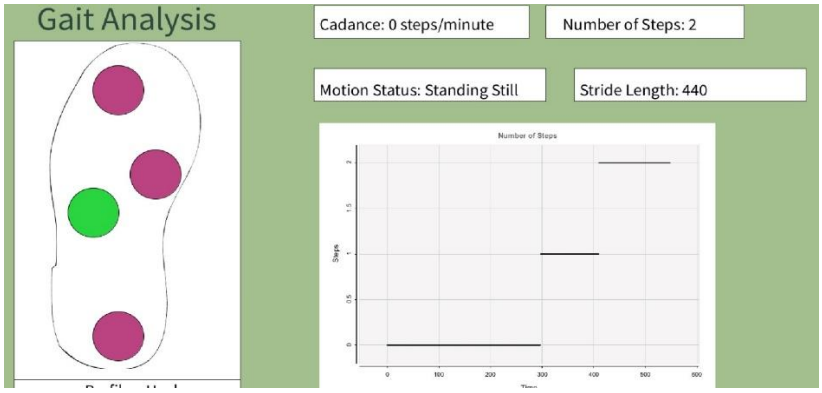


Fig 3: When motion status is Standing still

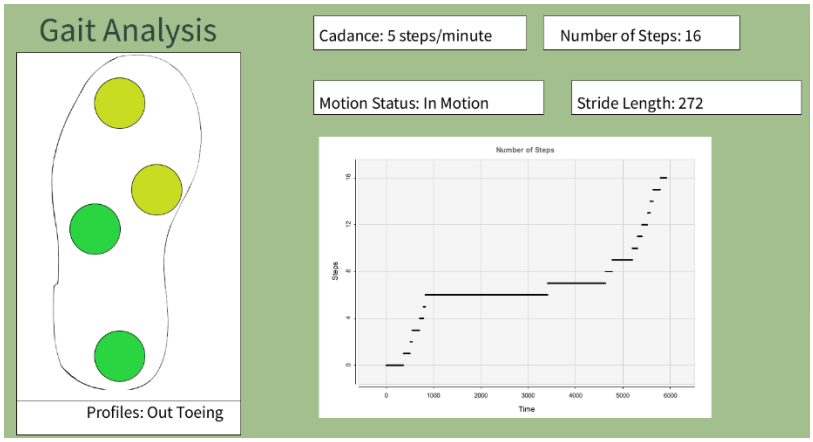


Fig4: When motion status is in Motion