CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)

Matthew Cho

Project Number

J0908

Project Title

Smart Shoes: An Innovative Method to Analyze and Correct Improper Gait

Abstract

Objectives/Goals

My project goal is to measure the angle of the user#s feet, to determine if their gait was proper, display the collected data or allow for real time correction of the feet, and provide a program that professionals could use to analyze data.

Methods/Materials

Arduino Nano, 3 axis gyroscope and accelerometer, Bluetooth module, buzzer, button, battery, and a pair of shoes.

Results

Using gyroscopes and accelerometers, the shoes can measure the angle and acceleration of your feet. The shoes can beep when your feet exceed an angle. When the user hears beeps, they will adjust their feet, which leads to better gait. They can also send data to a computer for a deeper analysis of the data.

Conclusions/Discussion

The shoes can identify the angles of the user's feet to identify if they have improper gait. The shoes can also correct gait by alerting the user of their gait. The user will in turn correct their feet until their gait is proper. Professionals can also analyze the data for a deeper understanding of their patient#s gaits.

Summary Statement

Smart shoes are shoes that measure the angle and acceleration of your feet to allow for correction and identification of improper gait.

Help Received

My father helped me understand some of the programming subjects such as wireless connection.