Maestro Mittens

**Team:**

* Kushal Majmundar (kmajmu3)
* Shayna Kapadia (shaynak2)
* Tulika Gupta (tulikag2)

**Problem:**

Not everyone knows how to play an instrument. And if they do, they might not know how to do it well and be able to stay in key. But they would like to be able to make some music!

**Solution Overview:**

We propose a hand gesture controlled instrument. Much like how a conductor waves their hands around, so would you. The gestures would translate into notes, and things like how quickly you move would make the music faster or slower as well. An accelerometer/gyroscope would be able to detect speeds and direction, while flex resistors on your fingers could control other musical aspects. These flex sensors will control how many notes you could play at a given time. For example, if you want to play a 3 note chord you could hold three fingers down.

The gesture control would be just for one instrument. We plan on making our own tones to use. For each note in a given range of notes, we will produce our own unique sound. In order to ensure that the sounds made by the user are pleasant to the ear, we will make the range of notes possible set to only notes in a specific key.

**Solution Components**

**Power Subsystem**

* The gloves will be powered with the help of a lithium ion battery.

**Sensor Subsystem**

* An Accelerometer/Gyroscope sensor placed at your wrist which can calculate the speed of your hands as well as the angle. The angle value will be used to distort the chord you play with your fingers.
* Flex Sensors will be placed in each finger of the glove to detect the angle at which you bend your fingers and how many fingers are bent.

**Processing Subsystem**

* An ESP8266 wifi board to accumulate and send out the data to a computer which will then realize the note to play and then play it.

**Criterion for Success**

Our gloves will allow the wearer to produce some sort of music in response to their hand/arm gestures and motions.

There’s a company called Stretchsense which has a hand gesture based glove. However, their product isn’t specialized as a musical instrument, as our project aims to be. Also, it appears that their gloves produce music based on their orientation with respect to a curved table, not just the gloves themselves. In addition, their product is very expensive and uses expensive sensors; while ours will aim to be more cost efficient.