



SMART GLOVE SIGN LANGUAGE CONVERTER



Department : IT

SMART GLOVE SIGN LANGUAGE TO TEXT AND SPEECH CONVERTER

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UNDER GUIDANCE OF PROF . V M KHARCHE

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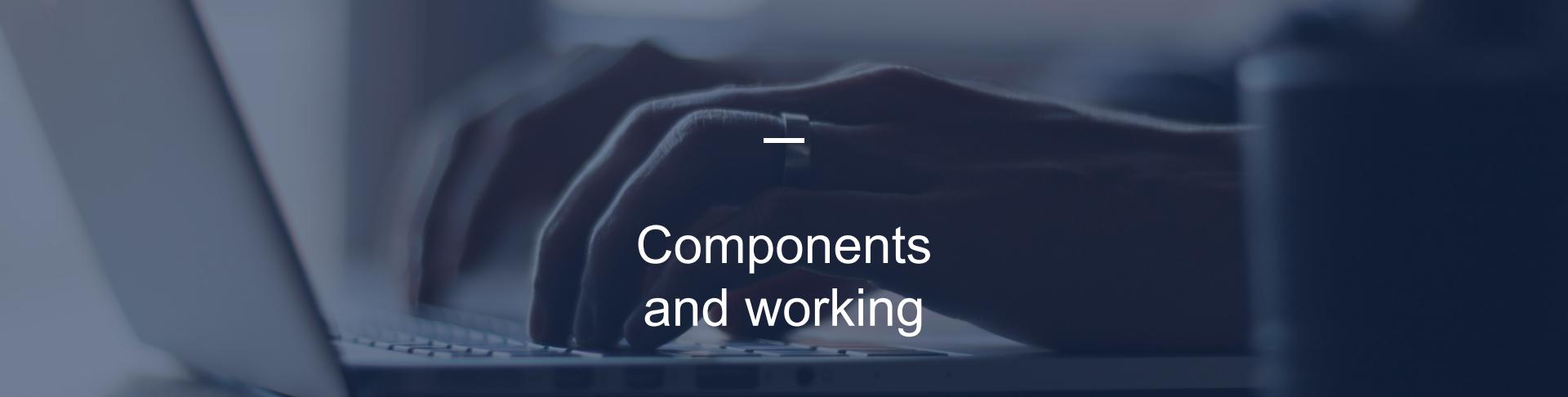
Objective

A basic and general idea of what is our project

objective

Summary Of Work

The main aim is to convert basic symbols that represents the 26 English letters. THE sole purpose of this project is to help the deaf community to easily communicate and interact with their nearby surroundings and display those letters on Smart phone . ACCELEROMETER is used to measure the tilt in the palm of smart glove . Five bend sensors are placed on glove four for fingers and 1 for thumb. These sensor measures the bend in fingers and thumb and palm and according to the bend angle value the arduino micro controller understands which set of value represents which symbol and transfer the appropriate outcome value to the android app via Bluetooth and which will be displayed on smart phone.



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Components and working

A general idea of what will be our core components of project and how will be the working

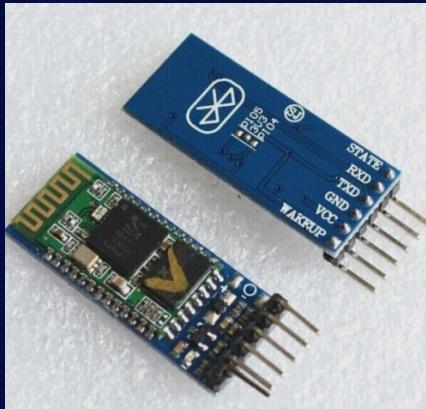
Components

Summary Of Work



Flex sensor

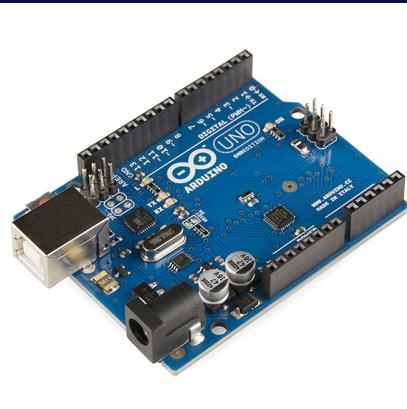
flex sensor are used to mesure the bend in the figure 4 for figure 1 for thumb according to bend angle value the Arduino will represent the corresponding symbol assigned



hc 05 Bluetooth module

It will diplay and speak the symbol generated from glove to smartphone into android

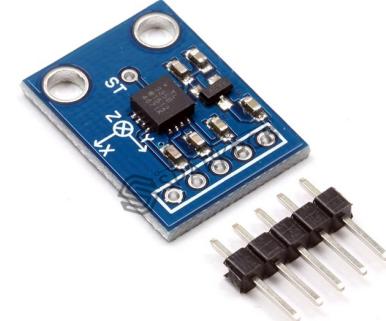
app



Arduino

Arduino is used as our central processing unit

NANO R3



Accelerometer

Accelerometer is used to measure the tilt in the palm
ADXL335

Working

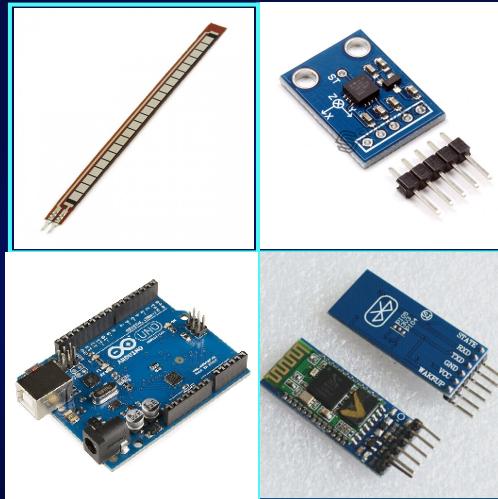
Summary Of Work

Step1

flex sensor are used to mesure the bend in the fingure 4 for fingure 1 for thumb according to bend angle value the Arduino will represent the corresponding symbol assigned

Step 3

Arduino is used as our central processing unit .all the tilt value and angle values are stored in arduino and the data from flex sensor and accelerometer will be accepted and according to ben of sensor the corresponding alphabet will be displayed and spoke on mobile



Step2

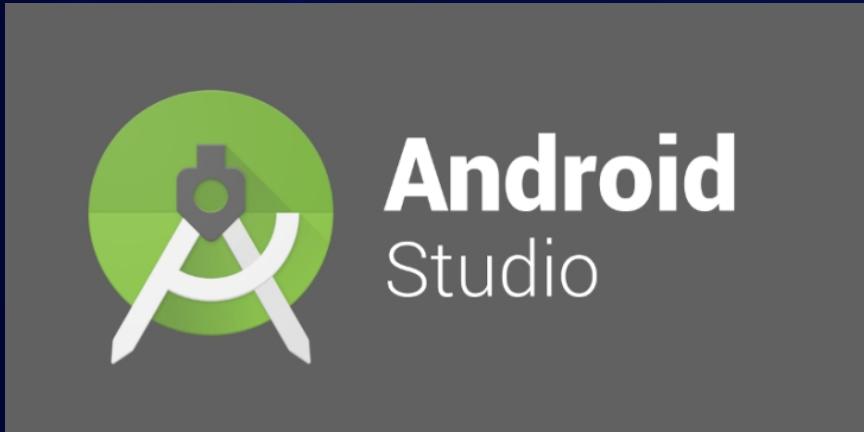
Accelerometer is used to measure the tilt in the palm and to fint the approximate value for the symbol

Step 4

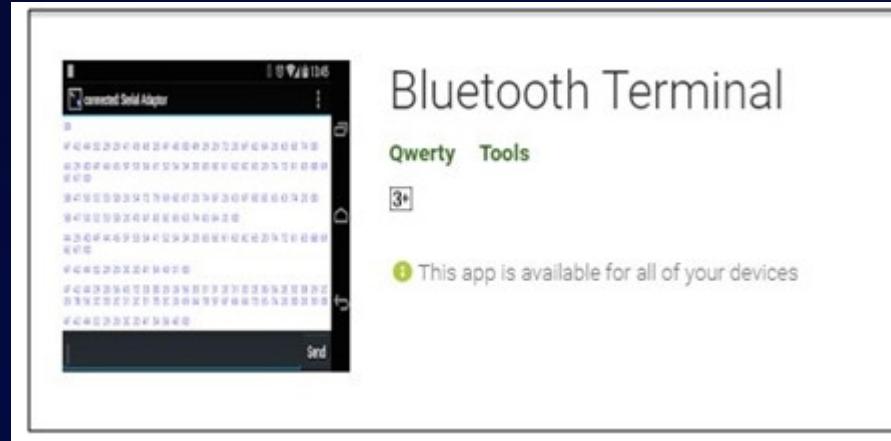
The data from arduino will be send to smartphone using this bluetooth module mand the alphabet will be displayed and dictated on smart mobile using a android app generated from android studio.

Android studio

Summary Of Work



Android studio will allow us to convert text into voice and also allow us to speak a text along with its display .



BLUETOOTH TERMINAL IS AN APP THAT IS USED HERE TO COMMUNICATE THE OUTPUT OF OUR SYSTEM / DEVICE. THIS IS AN OPEN SOURCE APP THAT CAN BE DIRECTLY CONNECTED TO THE BLUETOOTH TERMINAL JUST BY ADDING THE PORT VALUES SAME AT BOTH ENDS AND IT PROVIDES A PLATFORM ON WHICH WE CAN DISPLAY THE ALPHABETS AS WELL AS CAN HEAR THE AUDIO O THATT ALPHABET.

Future scope

Idea about what will be our future scope

Future scopes

a basic idea of how our project can be used in other purpose



Home automation

the system can be paired with controller to implement and provide home automation



Fitness

can be paired up with fitness sensor system to monitor the health



Dictation

can be used as an automatic dictation system for deaf and blind person . EG. book reading



help for disability

can generate help for disabled person for hearing and visual

LITERATURE SURVEY

A basic and general idea of literature survey done for the project.

literature survey

The idea behind project

With the advent of wearable technology, it is now possible to implement numerous and extremely creative ideas to serve humanity in unprecedented ways. Thus inspired, we have developed a smart system which would be able to serve as best friend to the hearing and speech impaired person. The primary goal of this paper is to design and implement a low cost wired interactive glove, interfaced with a Computer with higher degree of accuracy for gesture recognition .

In literature, the usage of data gloves has been found to be cumbersome and restrictive in the gestures which are possible in real applications . The use of light weight sensors and reduced number of bend sensors help in alleviating this problem while maintaining a high degree of recognition accuracy.

The main reason behind using flex Sensors is that the bend sensors have a limited sensing capability. They are unable to sense further bending beyond a certain threshold.

As mentioned in the abstract the glove is aimed at benefiting people with hearing and speech impairment. It can enable such differently abled persons to communicate normally with other people without a sense of inferiority or embarrassment.

With further modifications to the decoding procedure it can even enable a differently abled person to give a speech in a conference, thereby helping the truly talented minds, lacking the powers of speech and hearing, in expressing their ideas. Such a method has been tried and reported in literature

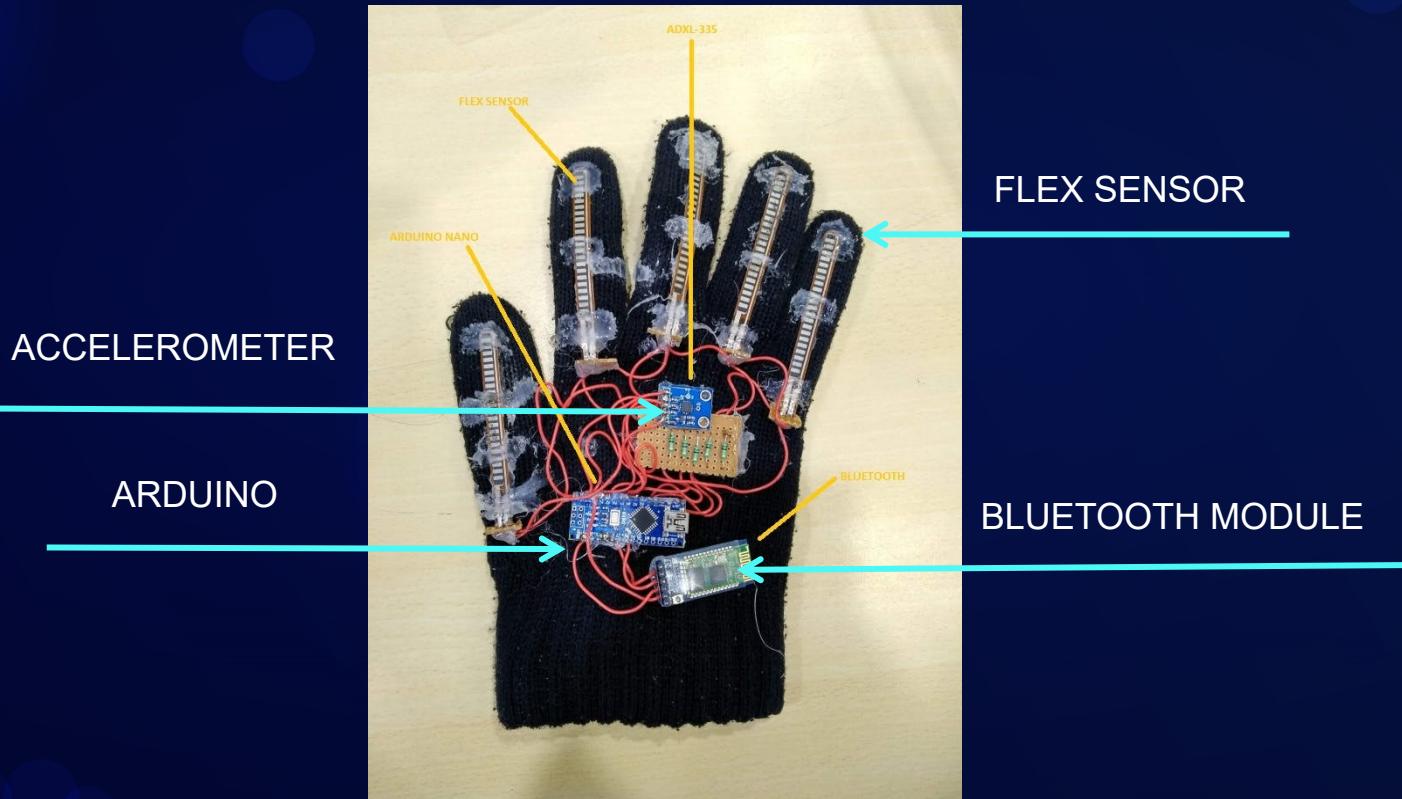
Flex sensors are sensors that change resistance when bent. This change in resistance can either be increasing or decreasing depending on the type of flex sensors used. This concept shows that if flex sensors are placed at the joints of fingers, they can be used to determine if fingers are bent or not. Given five fingers with two states each, one for bent and one for relaxed, finger gestures could easily be given a numeric code which be used as command signals for device control and virtual simulation.

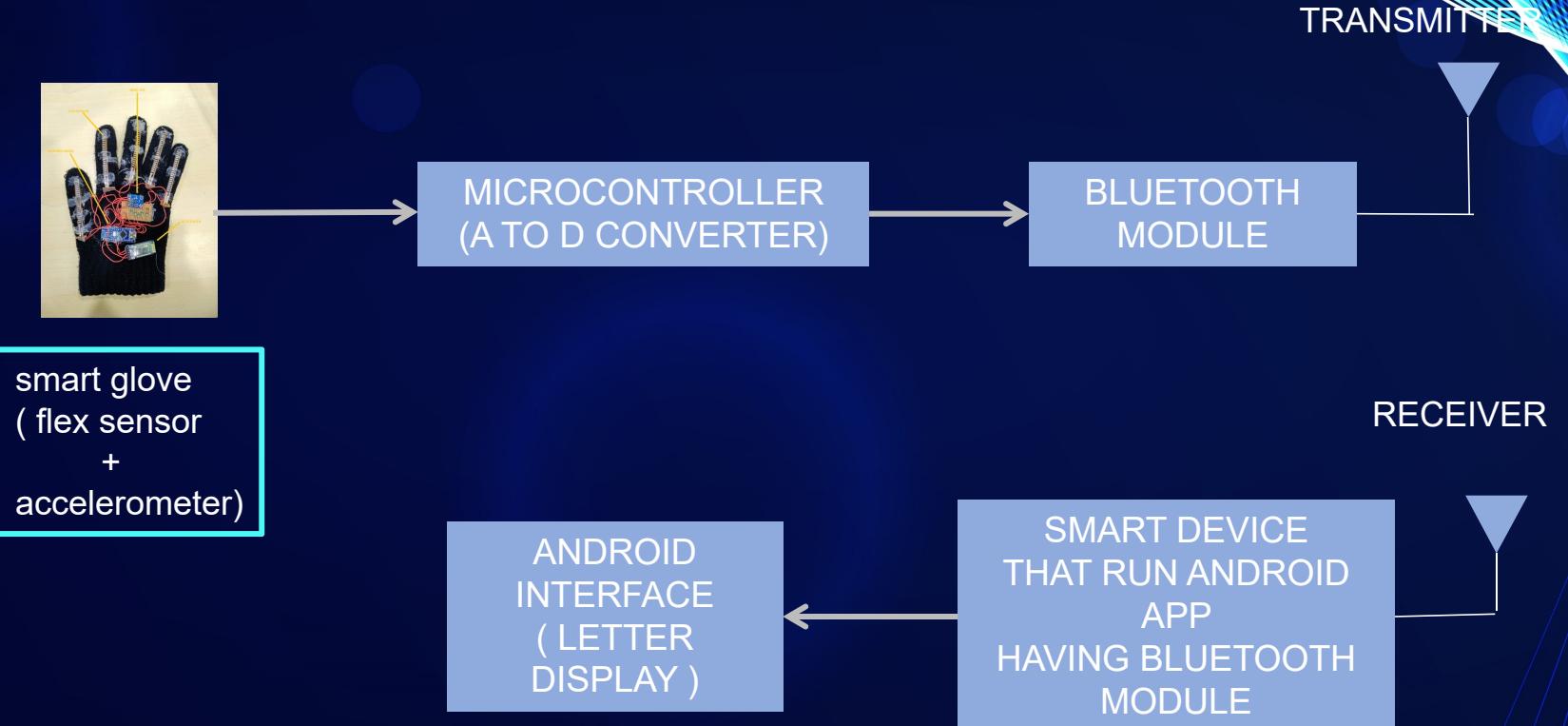
With this concept, flex sensors along with a digital accelerometer, which can be used to detect the hand tilting movements, can be placed in a glove allowing hand movements to be captured and be used as commands for device control and virtual simulation. Thus, it was aimed to create a low-cost wireless glove controller through the use of flex sensors and a digital accelerometer which allows the user to define specific finger gestures to be used to control robotic devices and generate 3d virtual environment.

Architecture and Design.

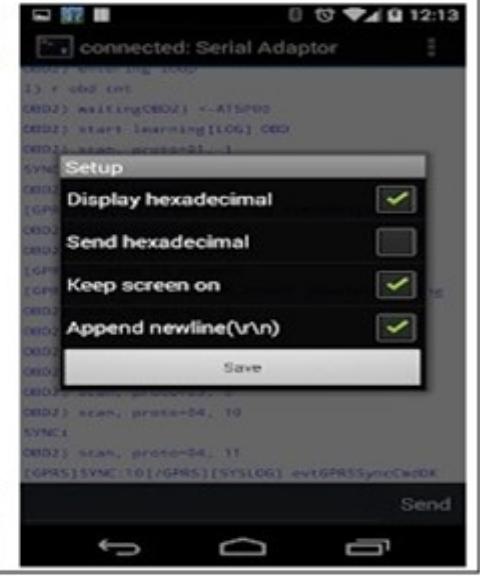
A basic and general idea of HOW the project is going to look in real life.

ARCHITECTURE AND DESIGN

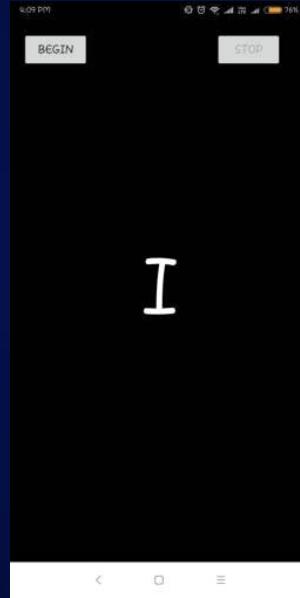
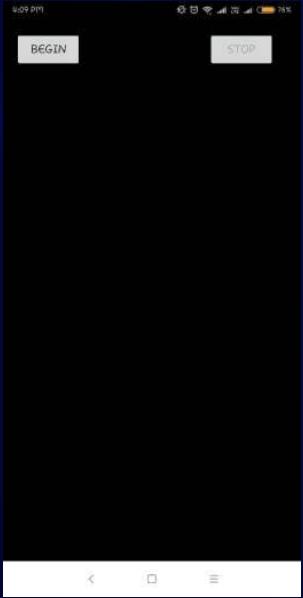




ANDROID APP INTERFACE / UI



ANDROID APP INTERFACE / UI



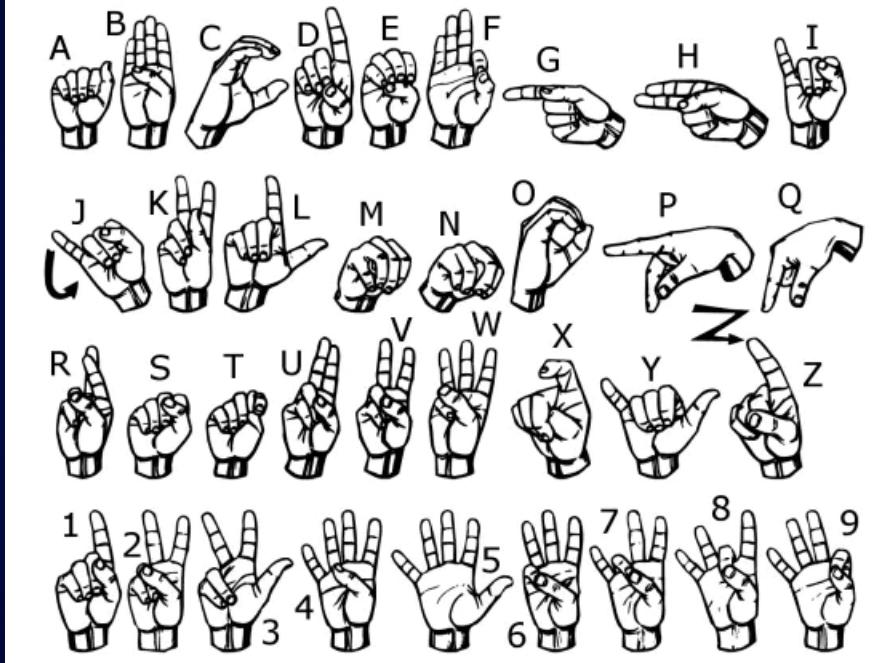
DATA COLLECTION

A BRIEF IDEA OF HOW DATA WILL BE ENTERED IN PROJECT.

you might be wondering how data is entered into the gloves and how the glove will give us the output ?

here is the answer to that





The aim is to convert basic symbols that represent the 26 English alphabet as mentioned under ASL (American Sign Language) script and display them on a smartphone screen.

1. WE set our flex sensorors minimum bend value and maximum bend value

```
int FLEX_PIN1 = A0;  
int flexADC1 = 0;  
int sensorMin1 = 1023;  
int sensorMax1 = 0;
```

2. calibrating the sensors for adaptivity with different bends

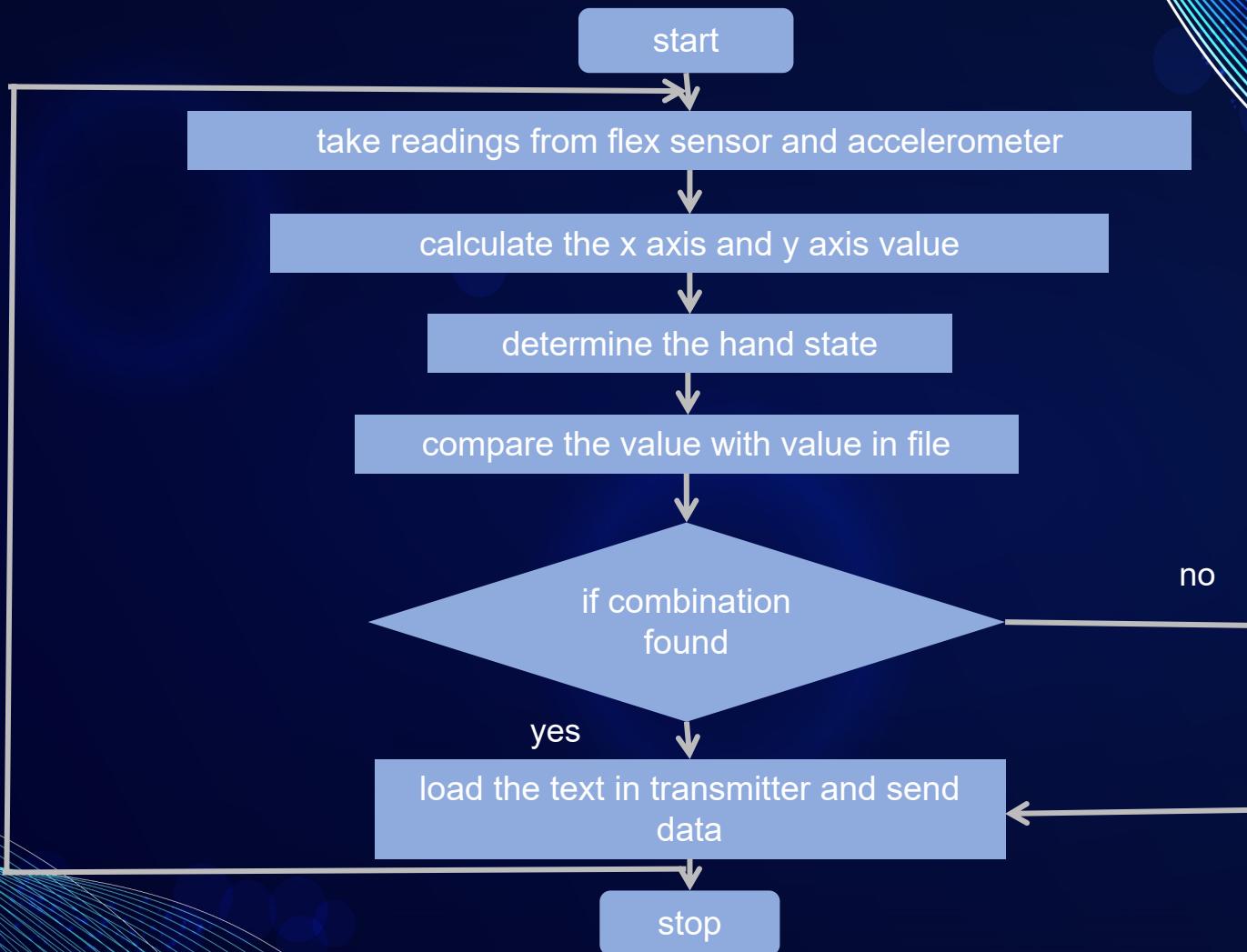
```
if(flexADC1<sensorMin1)
{
    sensorMin1=flexADC1;
}
if(flexADC1>sensorMax1)
{
    sensorMax1=flexADC1;
}
```

3. read the sensor value

```
if(flexADC1<sensorMin1)
{
    sensorMin1=flexADC1;
}
if(flexADC1>sensorMax1)
{
    sensorMax1=flexADC1;
}
```

3. capture the corresponding bend value alphabet.

```
if (
(angle1>=70)&&(angle1<=82))&&((angle2>=77)&&(angle2<=95))&&((angle3>=70)&&
(angle3<=86))&&((angle4>=73)&&(angle4<=85))&&((angle5>=0)&&(angle5<=45)
)
printfun('A');
```



Reference

Reference



glove for
translating sign g

We are using this reference for implementing flex sensor.



Indian Sign
Language Conv

We are using this reference to implement android studio.



two way.pdf

We are using this reference for flex sensor as well as android studio implementation . this is as same as the first reference but difference here is that this one have 2 way communication .



Accelometer
using flex sens

We are using this reference to implement accelerometer and flex sensor.

IMAGE LINK



<https://courses.ideate.cmu.edu/60-223/s2020/work/a-glove-that-translate-sign-language-into-text-and-speech/>

IMAGE LINK



<https://www.pinterest.ca/pin/294071050652773561/?autologin=true>



THANK YOU FOR WATCHING



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