

## Sign Recognition for Dumb and Deaf people using Android App.

1. Stela R. Wavikar      2. Ujwala D. Rode      3. Manali D. Sonar  
wstela1992@gmail.com      ujwalarode@gmail.com      manalisonar@gmail.com

Shatabdi Institute of Engineering and Research, Agaskhind, Nashik

**Abstract**— Sign language is the way through which deaf and dumb people can communicate with each other. It has been observed that, impaired people find it very difficult to interact with the society. Normal individuals can't able to understand their sign language. To bridge this gap, the proposed system acts as the mediator between impaired and normal people. This System uses Flex Sensor to capture the signs.

Flex Sensors are connected to the ARDINO Board. The Flex Sensor captures dynamic gesture. Thus the method is proposed for feature extraction of dynamic gesture of Indian Sign Language (ISL). As American Sign Language (ASL) is popularly used in the field of research and development, ISL on the other hand has been standardized recently and hence its ISL recognition is less explored. The propose method extracts feature from the sign through Flex Sensor and then transmit that sign signals through Bluetooth to the Android Mobile. This integrated feature improves the performance of the system; the system serves as an aid to disabled people. Its application includes hospitals, government sectors and some multinational companies.

**Keywords:**-Flex Sensor, ARDINO Board, Android Mobile, Indian Sign language (ISL), American Sign Language (ASL).

### Introduction

As the name suggests, this system gives voice to voiceless i.e. voice is given to the person who is not able to speak. Dumb/mute people use sign language for communication purpose. Sign language uses gestures instead of sound to convey information. This language includes combining hand shapes, hand movements. In this system flex sensors plays the major role. Flex sensors are attached to the glove using needle and thread. Flex sensors are the sensors whose resistivity varies with the amount of bend. In this paper, Arduino(ATMEGA328) is used to take input from flex sensors All the data from Arduino (AT MEGA328) is sent to android phone and accordingly the android phone will speak the corresponding character which has been sensed.

### I PROPOSED SYSTEM

This system improving the communication with the deaf and dumb using flex sensor technology. A device is developed that can translate different signs to text as well as voice format. Flex sensors are placed on hand gloves for the use of above said people. Flex sensor's resistance changes according to the flexion experienced. Sensors in the glove pick up

gestures and transmit that Arduino (AT MEGA328). This converted text data will be sent wirelessly via Bluetooth to an Android phone which runs Text to Speech software and incoming message will be converted to voice. Here device recognizes alphabets, numbers and symbols based on sensor movement.

### A. System Architecture

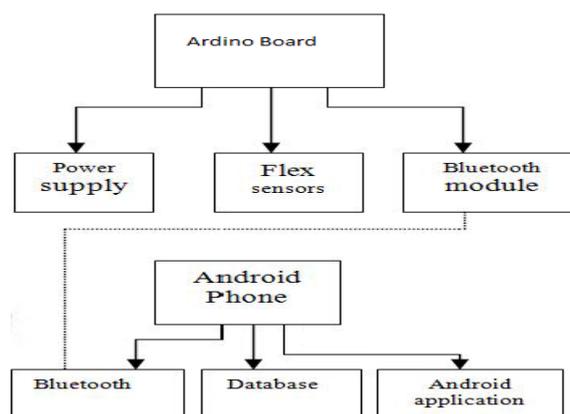


Fig: System architecture

In this system data glove is implemented to capture the hand gestures of a user. The data glove is fitted with flex sensors along the length of each finger and the thumb. The flex sensors output a stream of data that varies with degree and amount of bend produced by the sign. In this device Flex Sensor plays the major role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor The first module (input) acquires signs performed by a dumb person communicating with the system using sign language; Flex sensors outputs data stream depending on the degree and amount of bend produced by the sign.

B. Block Diagram

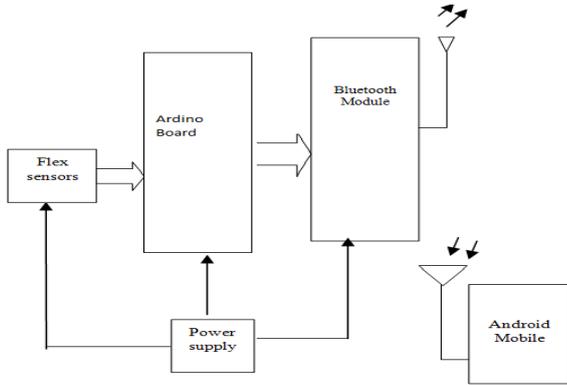


Fig: Block Diagram

II IMPORTANT PARAMETER

1) Flex Sensor:

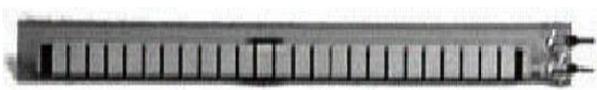


Fig: Flex Sensor

Flex sensors are attached to the gloves of the dumb and mute people. Through these gloves gestures has to be performed. Flex sensors changes their resistance as per the degree of bend. When there is no any bend, its resistance is 10kΩ. Flex sensors consist of number of conducting particles. When there is a bend, conducting particles in the flex sensors get separated. Due to this, current decreases and resistance increases. Therefore, flex sensors are also known as bend sensors Maintaining the Integrity of the Specifications.

2) Bluetooth Module:

The Arduino (AT MEGA328) sends the data to android phone by using Bluetooth module. In the proposed system, HC-05 Bluetooth module is used. The data from Arduino (AT MEGA328) is given to android mobile by using Bluetooth module. The database is created for different alphabets Sign Language in the android phone. When the input data matches with the data in the database then we will get the required output i.e. speech as well as text. To create android application.



Fig: Bluetooth Module

3) Android Phone:

The data from Arduino is given to android mobile by using Bluetooth module. The database is created for different alphabets of American Sign Language in the android phone. When the input data matches with the data in the database then we will get the required output i.e. speech as well as text. To Create android application java coding is used.

III. TECHNOLOGY & PROGRAMMING LANGUAGES

The technology used here is embedded technology which is the future of today's modern electronics. The proposed work includes combination of hardware and software. The followings are the various Programming Languages & technologies used in the proposed system.

For Android mobile

- SQL server based database
- java coding-Eclipse software
- Android application

IV. APPLICATIONS & ADVANTAGES

Advantages

- 1) Flexible: This system is flexible. That is the sign conversion can be made in any language.
- 2) Power consumption: It takes less power to operate system.
- 3) Flex sensors: Normal individuals can't able to understand their sign language. To bridge this gap, the proposed system acts as the mediator between impaired and normal people. This System uses Flex Sensor to capture the signs. Flex Sensors are connected to the ARDINO Board. The Flex Sensor captures dynamic gesture.

Application

1. Gesture recognition and conversion.
2. As a translating device for Mute people.
3. It can be used for Mobiles for SMS sending.
4. Translation of sign language in many regional languages.

## CONCLUSION

The project aim to reduce the communication gap between Deaf or dumb people and normal people. This system will Improve deaf/dumb person's lifestyle. Overall system effective And efficient because of the use of Ardino board and android Phone. This paper is an excellent exposure for the people Working in the area of designing system based on Ardino Board and android application.

## References:

[1] Editor: A Prototype for a Sign Language Interfacing System  
AUGUST 2014.

[2] C. Valli and C. Lucas, *Linguistics of American Sign Language: An Introduction*, 3rd ed. Washington, DC, USA: Gallaudet Univ. Press, 2000.

[3] B. Yi, "A framework for a sign language interfacing system," Ph.D. dissertation, Dept. Compute. Sci. Eng., Univ. Nevada, Reno, NV, USA, 2006.

[4] J. Loomis, H. Poizner, U. Bellugi, A. Blakenore, and J. Hollerbach, "Computer Graphic modeling of American sign language," *ACM SIGGRAPH Compute. Graph.* vol. 17, pp. 105–114, Jul. 1983.

[5] S. C. W. Ong and S. Ranganath, "Automatic sign language analysis: A Survey and the future beyond lexical meaning," *IEEE Trans. Pattern Anal. Mach. Intell.*, vol. 27, no. 6, pp. 873–891, Jun. 2005.