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# A Review on Hand Gesture Recognition for Deaf and Dumb People Using GSM Module

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**ABSTRACT:** Communication is the best media for the people to share their views with each other. About nine billion people in the world are deaf and dumb. The Communications between deaf-dumb with a normal person have always been a challenging task. Deaf and dumb people usually communicate via language, a form of illustration of words through hand and finger positions. To minimize this communication gap between normal person and these people for better interaction, we are developing an electronic device that can translate the sign language which is converted into speech in order to make proper communication between deaf and dumb people with normal person.

**KEYWORDS:** Flex sensor, Gesture recognition.

## I.INTRODUCTION

Communication with the other person is the best media for express our feelings, emotions through the words and sound. But some people cannot express his feelings, emotions through the word and sound those people are called as deaf and dumb. These people can express his feelings and emotions by using gesture and sign language but normal people don't understand his sign language, so for the proper communication between deaf and dumb with the normal person we are developing one device. By using this device deaf and dumb people can communicate with the normal person.

The proposed system is used the sign language for the communication. In this project an electronic speaking system is develop to ease the communication process of speech impaired people. We design one glove which is fitted with the flex sensor in our hand then the flex sensor sense the signal and this signal given to the microcontroller whereas all the data kept in the database, then microcontroller matches the motion of hand with the database and produce the speech signal i.e. we will get the output through the speaker. The system is also includes the text to speech conversion but in this system we can communicate with a long distance by using hand glove. In this system words are generated by a microcontroller i.e. we are using 10bit binary code in the form of 2048 words can be generated and these words will be transmitted in the form of voice calls with the help of GSM modem to communicate with a large distance in a phone calls.

## II.PROPOSED METHODOLOGY

**PROBLEM DEFINATION:**

To develop an electronic support system for avoiding communication gap between deaf-dumb and normal people we are using a gloves. It consists of five flex sensors which can transmit the signal in the form of voice calls with the help of GSM modem. It covers a large distance by using phone calls to make a communication easier between deaf and dumb people with normal person.

**OBJECTIVE OF THE PROJECT:**

According to the statistics given by the World Health Organization, about 285 million people in the world are blind,300 million are deaf, 1 million are dumb and many more suffering from one or more physical disabilities. The developments in Science and Technology have reached to great heights in making the Human Life easier and comfortable within a short span of time. During the last few decades, we have come across various technologies that have made our life so easier and comfortable that we even do not have to move our body to do a task. But always

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running in the race to be ahead of everyone we have forgotten that we still have a section of our population called the physically disabled people who are deprived of the advancements of Science and Technology because it has not given them that comfort that is required by them to feel that they too are the part of the society and they too can walk hand in hand with others. Communication being a fundamental aspect of human life is very much difficult for the people who are Deaf. There are a little means of communication between there people like the Braille Language for communication between Blind people and the Sign Language for Dumb and Deaf people. This paper is going to concentrate on the above mentioned fact and tries to develop a new instrument which can help differently abele people (Deaf and Dumb) to communicate easily in the living world with other normal persons.

## III.METHODOLOGIES OF IMPLEMENTATION

**BLOCK DIAGRAM:**

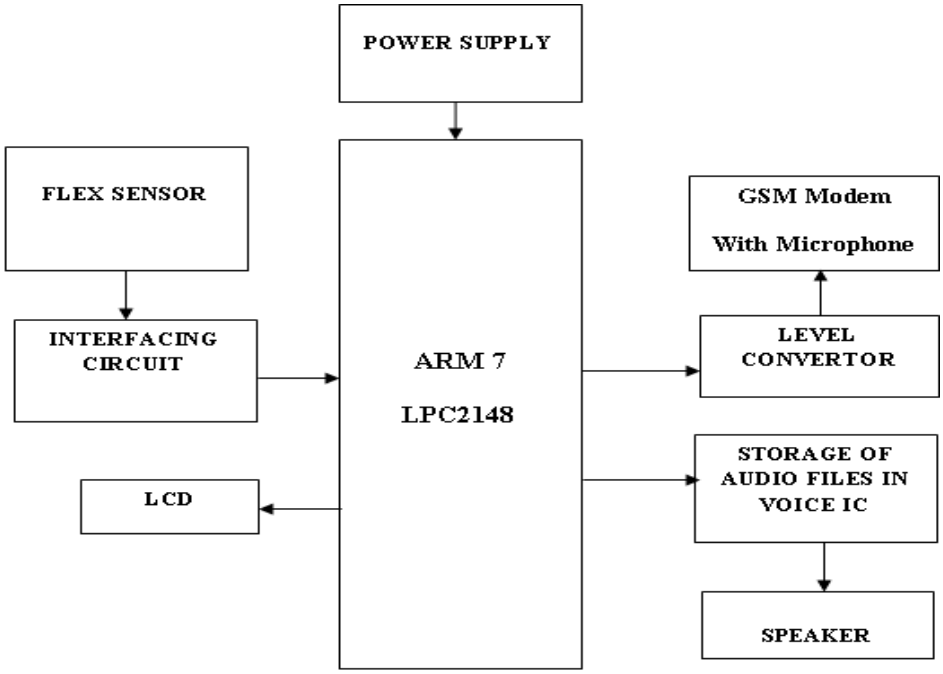


Fig.1: Block Diagram of Proposed System

**DESCRIPTION:**

Generally dumb people use sign language for communication but they find difficulty in communicating with others who don't understand sign language. This project aims to lower this barrier in communication.

In this electronic system we design one glove which is fitted with the flex sensor in our hand then the flex sensor sense the signal and this signal given to the ARM7 LPC2148 whereas all the data kept in the database. Then ARM7 LPC2148 matches the motion of hand with the database and produces the speech signal i.e. we will get the output through the speaker. The system is also includes the text to speech conversion. In this system, words are generated by a microcontroller and these words will be transmitted in the form of voice calls with the help of GSM modem to communicate with a large distance in phone calls. If the call is not received then message will be send through GSM.

**REQUIREMENT:**

**HARDWARE:**

- ARM7 TDMI(LPC-2148)
- Flex sensor
- LCD display
- GSM modem

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**SOFTWARE:**

- Programming language: Embedded c
- Complier: keil-uVision3/4
- Proteus

**FLEX SENSOR:**

Flex Sensor are analog resistors. They work as variable analog voltage dividers. Inside the flex sensor are carbon resistive elements within a thin flexible substrate. When the substrate is bent, the sensor produces a resistance to 30-40kohms at 90 degrees. The sensor measures ¼ inch wide, 4-1/2 inches long and 0.19Inches.

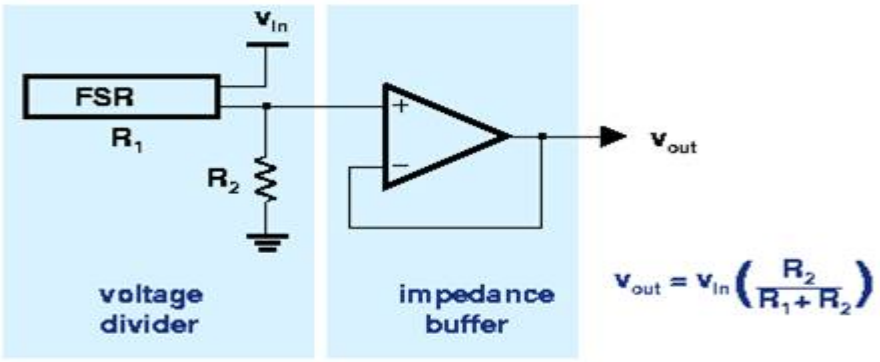


Fig.2: Basic flex sensor

Flex sensors are normally attached to the glove. They require a 5-volt input and output. The impedance buffer is a single sided operational amplifier, used with sensors because the low bias current of amplifier reduces error due to source impedance of flex sensor as voltage divider. The LM358 or LM324 op amps are the suggested. To adjust the sensitivity range in circuit a potentiometer adjustable buffer can be added. For variable deflection threshold switch, an op amp is used and high or low outputs depending on the inverting input voltage. In this way flex sensor can be used as a switch without going to a Microcontroller. In resistance to voltage converter using a dual sided supply op-amp and the sensor uses as the input of a resistance to voltage converter. The positive output is derived by a negative reference voltage in flex sensors. When the need of the low degree of bending then it is get utilized and applied. Resistivity varying with the sensor's degree of bend and the voltage output changing accordingly. The output voltage is determined based on the equation Vin * R1 / (R1 + R2), where R1 is the other input resistor to the non-inverting terminal. Using the voltage divider concept the output voltage is determined and it ranges from 1.35v to 2.5v.

Fig.3: Gloves with Flex sensor

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**GESTURE RECOGNITION:**

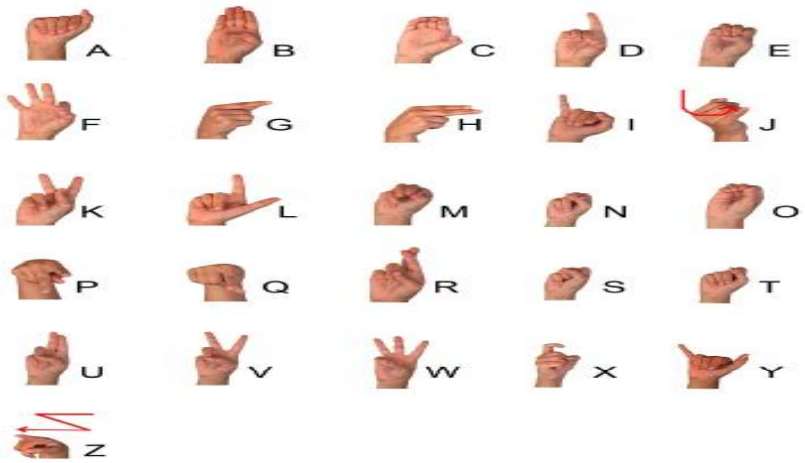


Fig.4: Hand Gesture for the different letter

Word mode: User can generate different voice message regarding to gesture
Eg: in voice hallow, hi, bye, come here, go, seat etc
Many projects used glove based systems for automatic understanding of gestural languages used by the deaf and dumb community. Gesture is the part of the recognition system. It contains data to match with incoming data. The system tries to match incoming data with existing posture. The bend values of the fingers and for each posture definition the distance to the current data is calculated. Then, the position/orientation data is compared in a likewise manner.
Sensor data are recognized and then recorded while a user performs various sign, correlating these with specific signs and mapping them to a database. The system stores sensor data in an array for recognition. When the sensor data matches the set of values associated with a sign system recognizes that sign and output it as text.

**FLOW CHART:**

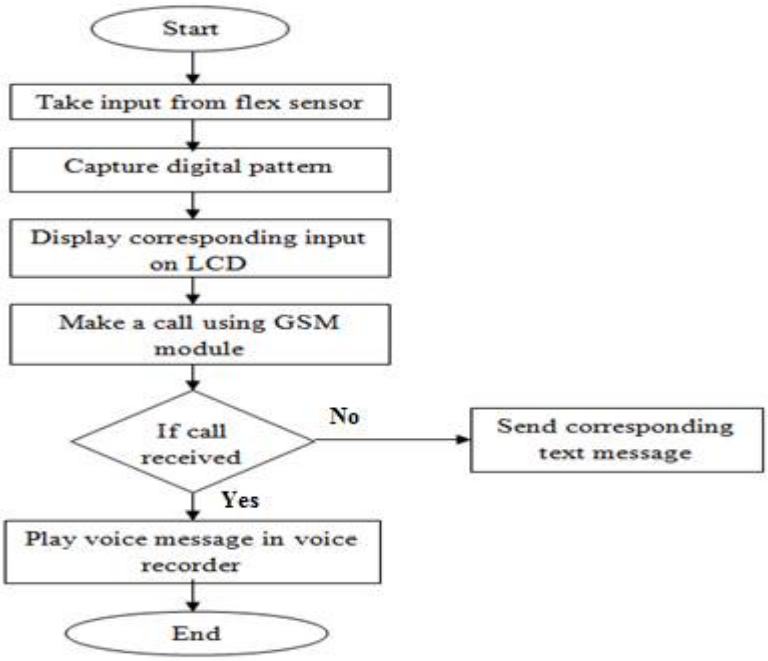


Fig.5. Flow chart of desired system

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Above figure shows flow chart of the desired system. In this system we are taking input from flex sensor which capture digital pattern and display corresponding data on LCD. Then we are making call using GSM module. If call is received by person then it will play a voice message otherwise it will send corresponding text message.

## IV.CONCLUSION

In this project an electronic speaking system was developed to ease the communication process of speech impaired people. With this project, deaf or dumb people can use the gloves to form gestures according to sign language which will be converted in to speech. Our proposed system helps to mute peoples which are communicated with normal peoples in mobile phones by using hand gloves shapes.

## REFERENCES

[1].Sunitha K. A1, Anitha Saraswathi.P2, Aarthi.M3, Jayapriya. K4, Lingam Sunny5, Deaf Mute Communication Interpreter- A Review, International Journal of Applied Engineering Research ISSN 0973-4562 Volume 11, Number 1 (2016).
[2].Shoaib Ahmed .V, "MAGIC GLOVES (Hand Gesture Recognition and Voice Conversion System for Differentially Able Dumb People)", Tech Expo-The Global Summit, London 2012.
[3].P A S Ram kumar1, N S N Lakshmipathi Raju2, T Saran kumar3, V Venkateswarulu4, Hand Gesture Recognition Using Sign Language Transcription System,Research Article Volume 6 Issue No.10, 2016 IJESC.
[4].Kamalpreet Sharma, Naresh Kumar Garg, "Hand Gestures Recognition For Deaf And Dumb", International Journal of Computer Application and Technology (s), May - 2014, pp. 10-13.
[5].Sonal Garg,,Shivani Singhal, Suman Kumari, A review paper on Hand Gesture Recognition and Voice conversion system, International Journal of Scientific & Engineering Research, Volume 6, Issue 10, October-2015.
[6].1G.Yella Reddy, 2M. Ramana Reddy, M.Tech, Ph. D, Design of Ultrasonic Spectacles, Flex Sensor Based Voice Generation and Speech to Text (Data) Conversion Techniques for Physically Disable People, IJRECE Vol–1, Issue-2, Oct - Nov, 2013.
[7].MANGESH T NIKAM1, SONALI R GHODUNDE2, KALYANI V SONAWANE3, VIDYARANI R GAWADE4, Talking Hands for Deaf and Dumb People, International Journal of Scientific & Engineering Research,Vol.04,Issue.03 February-2015.
[8]. Praveenkumar S Havalagi, Shruthi Urf Nivedita, THE AMAZING DIGITAL GLOVES THAT GIVE VOICE TO THE VOICELESS, International Journal of Advances in Engineering & Technology, Mar. 2013.
[9]. Pallavi Verma1, Shimi S. L. 2, Richa Priyadarshani 3, Design of Communication Interpreter for Deaf and Dumb Person, International Journal of Science and Research (IJSR), ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438.
[10]. Sunita V. Matiwade1, Dr. M.R.Dixit2, Electronic Support System for Deaf and Dumb to Interpret Sign Language of Communication, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 5, Issue 5, May 2016.
[11]. 1V. RAMYA,2 B. PALLANIAPPAN, DESIGNING AN EMBEDDED COMMUNICATION AID FOR SPEECH IMPAIRED USING XBEE AND GSM, Journal of Theoretical and Applied Information Technology 30th April 2014. Vol. 62 No.3.
[12]. 1Sunita V. Matiwade, 2DR. M.R.Dixit, Electronic Support System to Interpret Sign Language of Communication used by Deaf and Dumb Community, September 2015, Volume 2, Issue 9 JETIR (ISSN-2349-5162)