Speaking System for Aphonic People using Hand Signatures

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Abstract

In our planet there are more than 8 million aphonic people are present from their infancy age onwards. People with both speech deterioration and visual deterioration mostly uses the hand signatures to liaise with natural community. It is intricate for common people to apprehend towards the aphonic humanity. The liaise between both speech & visual deterioration people and ordinary mankind is always been an energizing quest to all over the planet. Hence aphonic liaise involves scholiast or an application to remould their indication to articulate. Previously it was developed by using binary data and image capturing techniques which are complicated while travelling and cost expensive. Therefore the system being proposed is with the use of only flex sensors, arduino nano r3.

Keywords: Aphonic, Arduino Nano r3, Flex Sensors, Hand Signatures, Liaise

I. INTRODUCTION

Aphonic people need to articulate with the society for their day-to-day life schedule. The aphonic people throughout the planet uses the hand signatures to articulate with community. However there must be a scholar who must sustain an unique preparation to transliterate between aphonic and the whole community. By establishing an liaise towards aphonic should be an absolute necessity in present and future too. Hand signatures are essential solid movement of fingers by impaired people to channel the data which they need to say. Hand signatures are heavy stands for communication among aphonic and the society. In reality signatures are intensely embedded in our daily communication through mobile or in personal conversation. There are vast signatures throughout the planet which convey compound meanings and understanding them is a compound quest to the people who are unaware of that particular skill present in that language. All the sign languages uses hand signatures and other difficult non-verbal operation to confess their meaning. It associates with the particular hand signs using fingers without any movement of arms, body or any kind of exterior expressions. The liquid crystal display of size 16*2 shows the word if the people are speech deterioration. The speaker gives the output as voice if they are visually deterioration. It was always a quest to find an scholar in a society that who understands the impaired sign language to convey their basic or emergency needs easily at present and future situations. The inspiration for designing such useful application came from the fact that it would demonstrate a greatest responsibility that every human have towards the psychologically adding people , by improving the social awareness among them toward the society by using the American sign language which is easy to learn to all.

In present state there is a vast communication difference between special and normal people, to overcome this difficulty we are using only the most common sign language in the planet which can be used to liaise with each other what they need to communicate really with their own words .The idea is to create an sign language talking system by only five fingers of one hand using flex sensors and arduino nano r3.

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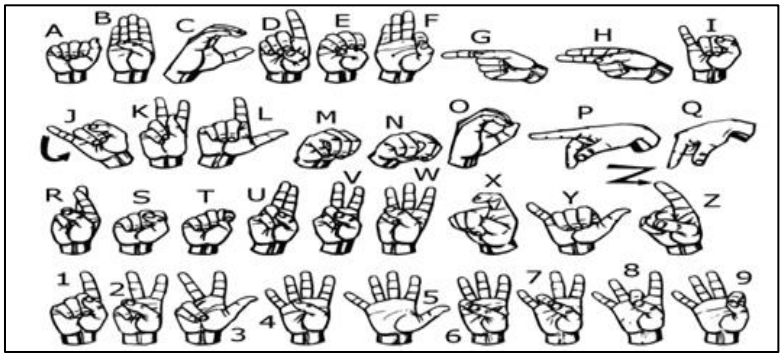


Fig. 1.1: Alphabets in ASL

II. LITERATURE SURVEY

Many researchers are working in paddock of signature identification of American Sign Language. keeping the identical discussion in mind vast scientist came up with an advanced systems. Few of developing systems follows only Indian Sign Language but the most common language used in our planet is American Sign Language which was invented in 19th century at New England and it was a French Sign Based system. Wide range of scientists invent smart gloves in past years by using image processing with some expensive software's like MATLAB (Matrix Laboratory) and with some modules which are having distinct features that useful to communicate with others. These are less weight but cost is too expensive and having difficult level is high while travelling. There are mainly four systems which were introduced in past.

The first one is embedded based hand talk assisting system. It is mainly based on the clicking the push buttons as the binary data by assigning a specific routine to an hexadecimal data. It only says emergency words such as daily routine words like "I am sick", "I need water".. etc. These are only displayed at LCD display.

The second one is an interactive glove which was developed by many scientists in the year 2015 for only the specified day-to-day routine words only. It is an wireless communication in which it display's output in our mobile phone which must be an android.

Next to it there is an imaged processed glove by using MATLAB software in which we have to store all the words or the numbers in database that which it compare's the given gesture through the whole database which is time taking process. In this we take two color papers to two fingers that which having different angles based on the different languages. This is expensive software that which we have to buy or by installing the pirated software's there is a problem that all the features present in original one is not accomplished to do any program.

Last there is a glove which is based on image detection using Open-CV (Computer Vision). It is also a database model in which they used an raspberry pi and flex sensors. In this the output is based voice only through an android application by using MIT-app inventor. There is a drawback that if raspberry pi is used for long time it will get heated and shutdown, we have to upload code each and every time if it turned off. It is difficult to handle and danger while travelling. All the above mentioned proposed systems were difficult and time taking process in which they only say about the routine words but not what he want to communicate with the other in the community.

III. PROPOSED METHOD

This paper consists of an speaking system for aphonic people using hand signatures. The above block diagram represents the architecture of glove inbuilt with the components of flex sensors, arduino nano r3, LM386 audio amplifier inbuilt board, LCD display and talkie library with arduino IDE software. In this method arduino nano is a small microcontroller and interfaced with the five flex sensors from thumb finger tolittle finger, display the alphabets through normal speaker by amplifying circuit. We are given only 5v supplied by power supply from arduino nano board.

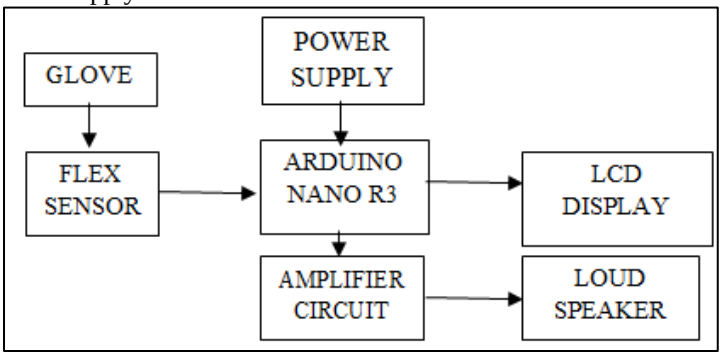


Fig. 3.1: Proposed System Block Diagram

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A. Arduino Nano R3:

It is a small microcontroller, compatible, versatile and friendly in nature. It contains ATMEGA328P processor with 32 pins including ground and two different types of supply voltages 3.3V & 5V. it contains simple functions to read and write a particular value. It is as simple as C language programming.

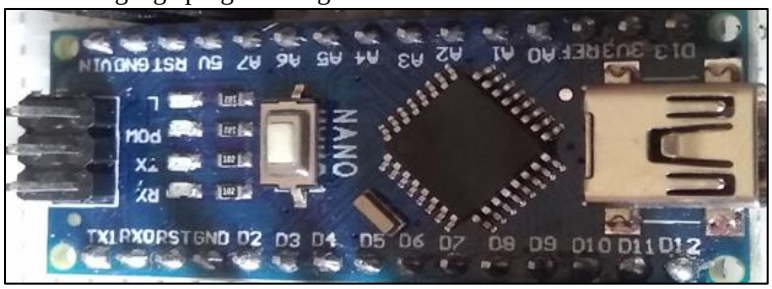


Fig. 3.2: Arduino Nano R3

B. Flex Sensor:

This is a sensor based on the resistance that when there is a slight bend in the sensor the values are changed. It is also known as variable resistance. The sensor is present in two particular sizes 2.2 & 4.5 inches. These sensors can calculate low resistance, high resistance and medium resistance. These sensors convert the bent angle to resistance parameter, can be measured using multi meter.



Fig. 3.3: Flex Sensor

C. LM386 Audio Amplifier Board:

This board acts as an small Mic and loud speaker system which amplifies the output from the Arduino board to an understandable voice. It removes the noise from the output voices. It gives us loud and clear voice without any interrupting signals.

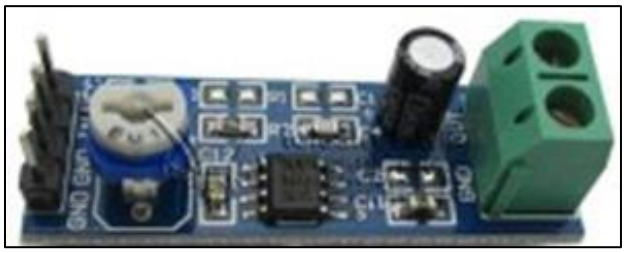


Fig. 3.4: LM386 Audio Amplifier

D. LCD Display:

The full form is liquid crystal display which is an optical device having the features of electronically modulating properties including polarizers. 16*2 is the basic LCD display having 2 rows and 16 columns. It is used to display both the numbers and letters. It can also display up to hexadecimal binary numbers only.



Fig. 3.5: LCD Display

IV. WORKING

The main theme of this project is to develop an assisting system to the people who are visually and speech deteriorated. The main goal of our project is to make Aphonic people to communicate with the society. In our project signatures play major role to

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communicate with each other. There are five flex sensors from thumb finger to little finger varying the resistances in between 0 to 1023. By taking all the five variable resistance values keeping them in if loop with logical AND condition to compare with the hand signatures and to display it in the LCD. By including the talkie library in the Arduino IDE software it helps to spell the voice of particular alphabets, numbers and emergency words.
This project contains three different modes like Mode 1,2 & 3.
When Mode 1 is activated and give the particular hand sign of a number it displays and spells that particular number.
When Mode 2 is activated and give the particular hand sign of an alphabet it displays and spells that particular alphabet.
When Mode 3 is activated and give the particular hand sign of an emergency words it displays and spells it.
We would like to change the digital pin due to drawback of push buttons when we press a push button it will be high for a particular time interval only. For each and every time if they need to say a number they must click on the push buttons every time. Instead of that we have implemented this method of prototype that they can communicate with number sign system also.

A. Mode 1:

In this mode digital pin 4 acts as input and if it is given to the digital pin 5 then the loop enters into the number section in the program. For numbers there are 9 different hand signatures.

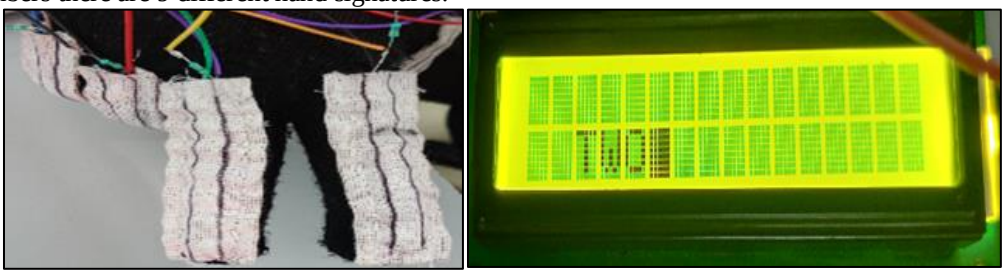


Fig. 4.1: Output of Mode 1

B. Mode 2:

In this mode digital pin 4 acts as input and if it is given to the digital pin 6 then the loop enters into the alphabet section in the program. For alphabets there are 26 different hand signatures.

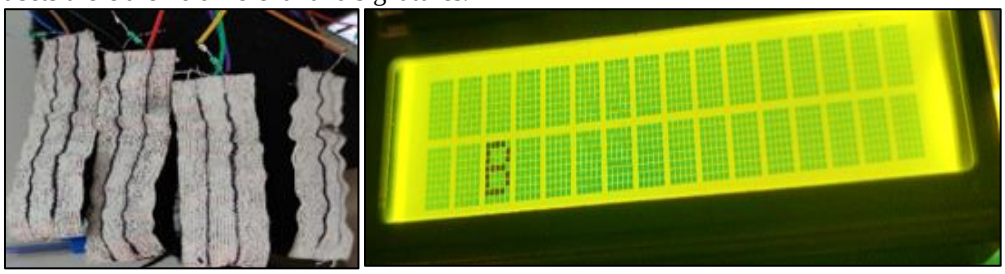


Fig. 4.2: Output of Mode 2

C. Mode 3:

In this mode digital pin 4 acts as input and if it is given to the digital pin 7 then the loop enters into the Emergency words section in the program. For emergency words there are minimal different hand signatures.

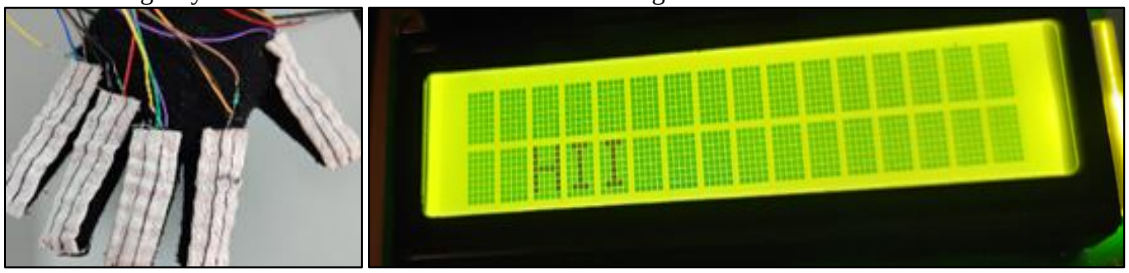


Fig. 4.3: Output of Mode 3

V. RESULTS AND DISCUSSIONS

This solution helps to the Aphonic people in reality whatever they want to communicate with the society using American Sign language. This project is available in low cost which can be affordable by everyone in the community. Our prototype not only displays but also gives output through voice as shown in below figures.

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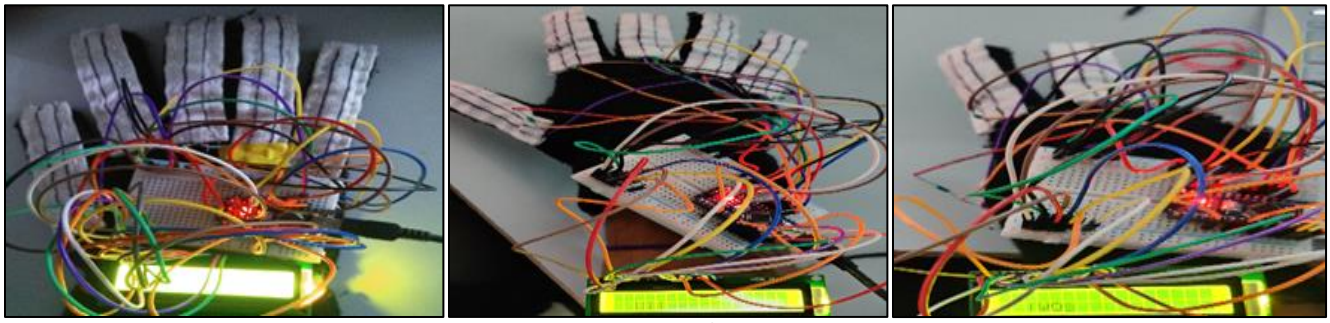


Fig. 5.1: Final output of the prototype

VI. CONCLUSION

This paper introduces the prototype of speaking system for Aphonic people using hand signatures in American Sign language which is common throughout the planet. It is more reliable, versatile, less expensive, easy to use and portable. This will be most helpful to the special persons in the society who lost their trust towards others can be rebuilt in them.

During this paper we faced many problems that we would like to improve using the current technologies like wireless transmissions or through mobile applications. If we include the current technologies then the circuit is complicated and expensive. So, we would like to propose this prototype with a minimum cost, just by including talkie and TTS library into the software which solves the communication problems between normal and special persons.

ACKNOWLEDGEMENT

Without the guidance and motivation of many people who are having troubles in the day-to-day life, this project could not achieve as it did. In this many people are our advisors, our faculty of Electronics And Communication Engineering department at Vasireddy Venkatadri Institute of Technology and our fellow students. This project would not exist without the moral support of our guide Ms.R.Tejaswini (Ass.Professor). With the help of our Electronics and Communication Department, we would not have resources to complete this project.

REFERENCES

[1] Arthi M, Vijayalakshmi P, “Sign language to speech conversion,” 5th International Conference on Recent Trends in Information Technology 2016.
[2] Priyanka Lokhande, Riya Prajapati and Sandeep Pansare, “Data Gloves for Sign Language Recognition System” IJCA Proceedings on National Conference on Emerging Trends in Advanced Communication Technologies NCETACT, pp. 11-14, Jun 2015.
[3] Vinod J Thomas, Diljo Thomas, “A Motion based Sign Language Recognition Method”, International Journal of Engineering Technology, volume 3 Issue 4, ISSN 2349-4476, Apr 2015.
[4] Sakshi Goyal, Ishita Sharma, Shanu Sharma,“Sign Language Recognition system for deaf and dumb people,” International Journal of Engineering Research and Technology Vol.2 Issue 4, April 2013.
[5] Ghotkar, Archana S., “Hand Gesture Recognition for Indian Sign Language”, International Conference on Computer Communication and Informatics (ICCCI), 2012, pp 1-4.
[6] Rajan, P. Subha and Dr G Balakrishnan, "Real Time Indian Sign Language Recognition System to aid Deaf and Dumb people,” 13th International Conference on Communication Technology (ICCT), 2011.

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