

## IMPLEMENTATION OF GESTURE TO SPEECH CONVERSION USING ANDROID SYSTEM

M Kasiyammal<sup>1</sup> P Amrutha<sup>2</sup> Archana B T<sup>3</sup>

<sup>1</sup>Assistant Professor, ECE, Dadi Institute of Engineering & Technology, Visakhapatnam

<sup>2</sup>Assistant Professor, ECE, Dadi Institute of Engineering & Technology, Visakhapatnam

<sup>3</sup>Assistant Professor, ECE, Dadi Institute of Engineering & Technology, Visakhapatnam

{<sup>1</sup>kasi.kutti@gmail.com <sup>2</sup>archanabt@gmail.com <sup>3</sup>amrutha.p4@gmail.com }

**Abstract.** The communication among human beings is executed by speech, expressions and gestures. In that, the expressions and gestures are mostly used by speech defective people. Generally, the processing of gestures is always challenging. The data (gesture) can be obtained initially and it should be recognized properly. Usually, Dumb and paralyzed people use the signs or gestures for conversation with normal one. In this we propose an "Implementation of Gesture to speech conversion using Android System" which will assist those people who are suffering from speech defects. In present scenario android system is carried by everyone and Bluetooth module is equipped with the android system which has the coverage area around 100mts. Hall effect sensors are the sensors used to sense the gesture and sends the instruction to CPU (arduino board) from which the data is sent to the android mobile phone through text to speech app.

**KEYWORDS:** Hall Effect sensors, ATmega328 microcontroller, Arduino UNO, Bluetooth module, Voice recorder & playback unit, android mobile, LCD.

### 1 Introduction

Many of us are expressive with speech whereas some of speech defect people express themselves with signs or gestures. The types of gestures are (i) static, (ii) dynamic. First type is a posture or a certain pose which is easy to compute. Though there is computational complexity, the Real time applications are executed by the dynamic type only because of its sequence in posture. The communication barrier between speechless and normal people is removed with the help of this system. This gesture to speech conversion gives the output not only to speaker but also to android system as text message. The android system with bluetooth is provided to cover-up the distance about 100 metres. In order to implement the gesture conversion process with one of the recent technology, this embedded system is designed.

## 2 Block diagram

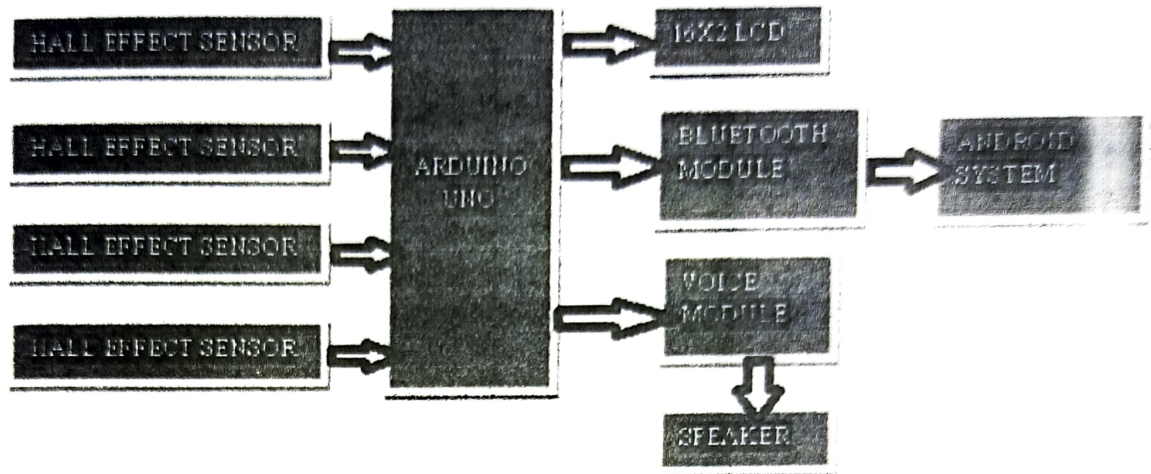


Fig.1. Block diagram of Gesture to Speech conversion system

## 3 Design Methodology:

**3.1 Hall Effect Sensor** –The hand gestures are received and will be sent to the arduino board by these sensors.

**3.2 Arduino**- This acts as the central processing unit of the entire system by which data transmission takes place between sensors and external devices like LCD, BLUETOOTH module, VOICE module and ANDROID system.

**3.3 Bluetooth Module**- It receives the processed signal from the arduino board and sends it to the android system for displaying the output. Bluesoleil which also supports Microsoft windows, Linux and windows CE is used. CSR, broadcom, marvel chipsets are also supported by it. Various Bluetooth drivers are also available for Bluetooth chips on modern computers.

**3.4 Voice Module and Speaker**-The audio signal is transferred to the speaker through voice module. A single chip Voice recorder cum Playback device is APR 9301. This can record and playback the voice of duration from 20 to 30 seconds. It doesn't require software and microcontroller due to its high quality voice recorder cum playback data storage capacity.

**3.5 LCD Display**- This is also provided to display the converted gesture into speech for the convenience of the user.

**3.6 Android System**-

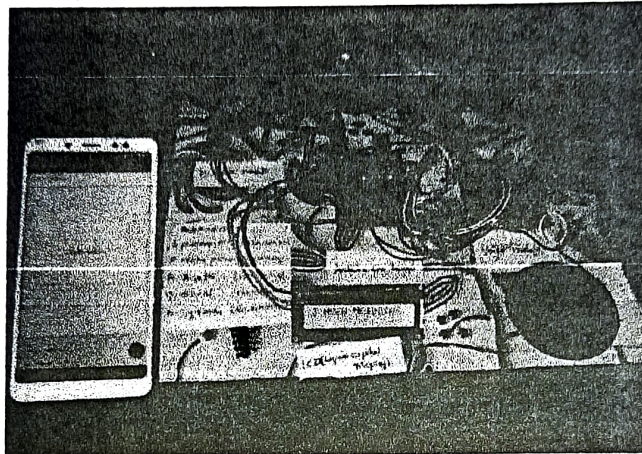
An operating system for Mobile Phone is 'android'. Smart phones and tablets use this version. It is a modified version of the Linux kernel and other open source software. Consortium of developers from Open Handset Alliance developed this operating system of mobile. The main contributor and commercial marketer of this OS is Google.

**4 Results:**

**4.1 OUTPUT OF GESTURE1**

The hand gesture from top joint of the index finger (which is the indication of the message 'I need Medicine') is received by Hall Effect sensor. When the sensor gets calibrated to the magnet then the gesture gets initialized and it displays the message (I need medicine) in LCD as well as it speaks out from the speaker.

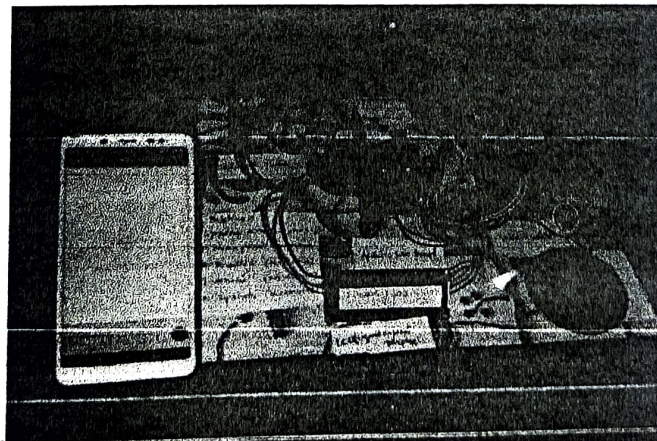
The result of the gesture "I Need Medicine".



**4.2 OUTPUT OF GESTURE1**

The hand gesture from middle joint of the index finger (which is the indication of the message 'I want Food') is received by Hall Effect sensor. When the sensor gets calibrated to the magnet then the gesture gets initialized and it displays the message (I want food) in LCD as well as it speaks out from the speaker.

The result of the gesture "I want food".



## 5 Conclusion

It is hard to see the people without mobile phone. In present scenario 80% of them is familiar of android mobile phone. We take that as an advantage to assemble this system. In order to overcome the disadvantages of the existing system (Like image processing difficulties and high storage capacity), this is designed with less storage and with ease of access. Smart gloves focus the translation of gestures into a small sentence which is converted into speech and displayed on the mobile phone. Principle Component Analysis method is used by smart glove for the classification of the real time input data for feature extraction.

## REFERENCES

- [1] G. R. S. Murthy, R. S. Jadon. (2009). "A Review of Vision Based Hand Gestures Recognition," International Journal of Information Technology and Knowledge Management, vol. 2(2), pp. 405-410.
- [2] P. Garg, N. Aggarwal and S. Sofat. (2009). "Vision Based Hand Gesture Recognition," World Academy of Science, Engineering and Technology, Vol. 49, pp. 972-977.
- [3] Fakhreddine Karray, Milad Alemzadeh, Jamil Abou Saleh, Mo Nours Arab, (2008) . "Human-Computer Interaction: Overview on State of the Art", International Journal on Smart Sensing and Intelligent Systems, Vol. 1(1).
- [4] Wikipedia Website.
- [5] Mokhtar M. Hasan, Pramoud K. Misra, (2011). "Brightness Factor Matching For Gesture Recognition System Using Scaled Normalization", International Journal of Computer Science & Information Technology (IJCSIT), Vol. 3(2).
- [6] Rafiqul Z. Khan, Noor A. Ibraheem, (2012). "Survey on Gesture Recognition for Hand Image Postures", International Journal of Computer And Information Science, Vol. 5(3), Doi:10.5539/cis.v5n3p110
- [7] N. Ibraheem, M. Hasan, R. Khan, P. Mishra, (2012). "comparative study of skin color based segmentation techniques", Aligarh Muslim University, A.M.U., Aligarh, India.
- [8] M. M. Hasan, P. K. Mishra, (2011). "HSV Brightness Factor Matching for Gesture Recognition System", International Journal of Image Processing (IJIP), Vol. 4(5).