Gesture Base Text and Voice Converter

Abhay Satmohankar¹, Ujwal Chavhan², Shikha Meshram³, Sandesh Bhavsagar⁴ and Anand Rewatkar⁵
¹B.E. Final Year Department of Electronics & Telecommunication Engineering, G.N.I.T College, Nagpur
²,³,⁴,⁵Professor at Department of Electronics & Telecommunication Engineering, G.N.I.T College, Nagpur

Abstract—Human beings interact with each other to convey their ideas, thoughts, and experiences to the people around them. But this is not the case for deaf-mute people & patient. Sign language paves the way for deaf-mute & patient people to communicate. Through sign language, communication is possible for a deaf-mute person & patient without the means of acoustic sounds. The aim behind this work is to develop a system for recognizing the sign language, which provides communication between people with speech impairment and normal people, thereby reducing the communication gap between them. Compared to other gestures, hand gesture plays an important role, as it expresses the user's views in less time. In the current work flex sensor-based gesture recognition module is developed to recognize English alphabets and few words and a Text-to-Speech synthesizer based on HMM is built to convert the corresponding text.

I. INTRODUCTION

The development of the most popular devices for hand movement acquisition, glove-based systems, started about 30 years ago and continues to engage a growing number of researchers. Communication involves the exchange of information, and this can only occur effectively if all participants use a common language. Sign language is the language used by deaf and mute people and it is a communication skill that uses gestures instead of sound to convey meaning simultaneously combining hand shapes, orientations and movement of the hands, arms or body and facial expressions to express fluidly a speaker’s thoughts. Signs are used to communicate words and sentences to audience. A gesture in a sign language is a particular movement of the hands with a specific shape made out of them. A sign language usually provides sign for whole words. It can also provide sign for letters to perform words that don’t have corresponding sign in that sign language. 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. This digital glove aims to lower this barrier in communication. It is electronic device that can translate Sign language into speech in order to make the communication take place between the mute communities with the general public possible. It can also provide sign for letters to perform words that don’t have corresponding Sign in that sign language. Sensor gloves technology has been used in a variety of application areas, which demands accurate tracking and interpretation of sign language. The paper explains the designing requirements, factors of digital gloves. This paper contains the map to develop a pair of gesture vocalize gloves. It gives the related works, explains the system architecture, characteristics and operation of each component in the system architecture. Provides the future works, advantages and disadvantages of this device. Sign language is the language use by deaf and mute people and it is a communication skill that uses gesture instead of sound to convey meaning simultaneously combining hand shape, orientation and movement of the hand, arms or body and facial expression to express fluidly a speaker’s thoughts. Signs are used to communicate word and sentence to audience. A gesture in a sign language is particular movement of the hand with a specific shape made out of them. A sign language is the language use by deaf and mute people and it is a communication skill that uses gesture instead of sound to convey meaning simultaneously combining hand shape, orientation and movement of the hand, arms or body and facial expression to express fluidly a speaker’s thoughts. Signs are used to communicate word language usually provide for whole words.

II. LITERATURE SURVEY

Sachin Bhat, Amruthesh M, Ashik, Chidanand Das and Sujith in their paper, "Translating Indian Sign Language to text and voice messages using flex sensors", in International Journal of Advanced Research in Computer and Communication
Engineering Vol. 4, Issue 5, May 2015 have designed a Gesture to voice conversion and have concluded that The more reliable, user independent and portable system to convert the sign language to text message from which consumes less power because of the low ultra power AT89S52 microcontroller is designed.

Priyanka R.Potdar, DR.D.M.Yadav "Innovative Approach for Gesture to Voice Conversion:Review".International journal of innovative research and development .vol 3,Issue 6, june2014. have designed Gesture to Voice Conversion and have concluded that completion of the project suggests that these wired gloves can be used for partial sign language recognition. In future work of this proposed system supporting more number of signs and different language mode.

Mr Prashant chaudhari,prof.G.R Phulay and Mr Ravindra Patil in their paper,"A Review on Hand Gesture Recognition System", in International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 3, January 2013 have designed a Hand Gesture Recognition System and have concluded that data glove can give promising results if used in the field of medicine and also be used for monitoring hand function for rehabilitation purposes.

Mr.M.V.N.R.P.Kumar, Mr Ashutosh Kumar, Mr.S.B.Arawandekar, Mr.A.ABhosale, Mr.R.L.Bhosale “AVR Based Gesture Vocalizer Using Speech Synthesizer IC”. International journal of Research in Advent Technology, vol 3,issue 5,May 2015 have designed Gesture to voice recognisation project and have concluded that The project aims to lower the communication gap between the deaf or mute community and the normal world. This project was meant to be a prototype to check the feasibility of recognizing sign language using sensor gloves. With this project the deaf or mute people can use he gloves to perform sign language and it will be converted in to speech so that normal people can easily understand. Sign language recognition system mainly have two wellknown approaches viz. Image processing technique and another is microcontroller and sensor based data glove. These approaches are also known as vision based and sensor based techniques. In the image processing technique camera is used to capture the image/video, in this static images are analyzed and recognition of the image carried out using algorithms that produce sentences in the display. The algorithms used in vision based sign language recognition system are Hidden Markov Mode (HMM), Artificial Neural Networks (ANN) and Sum of Absolute Difference (SAD). The disadvantage of vision based techniques includes complex algorithms for data processing. Visual based mostly techniques use camera chase technologies, whereby usually the user wears a glove with specific colors or markers indicating individual parts of the hands, specially the fingers.

III. RESEARCH AND METHODOLOGY

Block Diagram

The flex sensor pictured bellow changes resistance when bent. It will change only resistance in one direction. ANU flexed sensor has a resistance of about 10,000 ohms. As flex sensor is bent, there resistance increases to 30-0 kilo ohms at 90 degrees. The sensor measures ¼ inch wide, 4-1/2 inches long and 0.19 inches thick. In this two or three sensors are connected serially and the output from the sensor is inputted to the analog to digital converter in the controller.

In our project we use IC ATMEGA 16, which has four ports. PortA, Port B, Port Cand Port D.In microcontroller IC we connect Data Glove is fitted with Flex Sensors, Voice Recorder Kit, and Graphical LCD. When Flex Sensor is bending then it gives the signal to the microcontroller. Microcontrollers generate the two signal one output signal goes to the speaker through the voice recorder kit and another output signal is goes to the graphical LCD.
The ATMEGA 16 microcontrollers are used in this project. It consists of four port, port A, port B, port C and port D. The four flex sensors are connected to the port A. The 128x64 graphical LCD is connected to the port D. Voice recorder module is connected to port B. The pin number 30 & 10 are connected to the VCC and pin number 11 & 31 are connected to the GND. The 5 volt power supply is given to the circuit. When we store the command at a first finger is “I WANT A WATER” then it display on the graphical LCD as well as we can hear the sound from the speaker through voice recorder kit “I WANT A WATER”.

IV. RESULT AND CONCLUSION

This project is design for the need person which really wants a need. This project is utilized by specially the patient’s deaf dome peoples.

Gestural is quick and convenient to use. It expresses emotions and message including hands, face or other body parts to convey. Gestural control can allow the user to feel as though they are controlling world around them. Gestural control gives you to ability to control all yours devices from a distance without having to touch a thing. Flexible to user. It takes less power to operate. Gesture recognition is efficient to simple and greater accuracy features. Reduction in complexity.

It is used in Hospitals. It is used in Railway Station, Bus stop, Airport. Translation of sign language in many regional languages. It can be used in the field of fire extinguishing

REFERENCES


