



IMPLEMENTATION OF BIDIRECTIONAL VOICE COMMUNICATION BETWEEN NORMAL & DEAF & DUMB PEOPLE USING HAND WAVE & VOICE RECOGNITION

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ABSTRACT

Sign language is the most important methodology using which hearing and speech impaired people can interact with the rest of the world. Conversation with hearing impaired individuals gets complicated if the listener is ignorant of sign language. Hence it becomes important to construct a bridge between these two banks. Generally deaf and dumb people use sign language for communication but they find difficulty in communicating with others who don't understand sign language. This paper aims to give bidirectional communication between mute people and normal people. It is based on the need of developing an electronic device that can translate sign language into speech as well as speech into text in order to make the communication take place between the mute communities with the general public possible. Wireless data is sent using ZigBee from MEMS sensors along the length of each finger and the thumb. Mute people can use the sensor to make hand gestures and the signal is communicated to android mobile and it will be converted into speech on the mobile. So that normal people can understand their sign language. The normal person having an android mobile app which includes speech recognition system which is converted into the text format and send it to the electronic hand glove device subsequently it is displayed as a text what they are spoken.

Key words: Zero padding, Space time block coding, Signal to noise ratio, Adaptive array systems.

INTRODUCTION

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. 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

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for letters to perform words that don't have corresponding sign in that sign language. In this project MEMS sensor plays the major role, MEMS sensors are sensors that change in resistance depending on the amount of bend on the sensor. Signs are having signaled to transfer to the mobile app and it has to convert into speech. Another hand mobile is having speech recognition and converts into text which is viewed by mute people. We are in process of developing a prototype using this process to reduce the communication gap between differentially able and normal people.

Proposed system

In this paper data glove is implemented to capture the hand gestures of a user. The dumb person should use the MEMS sensor when they make the gestures. The MEMS sensors output a stream of data that varies with degree of bend. The analog outputs from the sensors are then fed to the PIC microcontroller. It processes the signals and perform analog to digital signal conversion. The resulting digital signal is encoded and transmitted through ZigBee system. Zigbee receivers receive the signal by the mobile via OTG. In this section the gesture is recognized and the corresponding text information is identified. Text to speech conversion takes place in the voice section and play out through the speaker in mobile. Mobile has APP convert into voice. Same mobile app is having voice recognition module the speech is converted into text which is communicated through ZigBee via OTG. In this section speech to text conversion takes place in the mobile section and it displays on the device. Zigbee receivers receive the signal by the mobile via OTG. In this section the gesture is recognized and the corresponding text information is identified. Text to speech conversion takes place in the voice section and play out through the speaker in mobile. Mobile has APP convert into voice .Same mobile app is having voice recognition module the speech is converted into text which is communicated through zigbee via OTG.

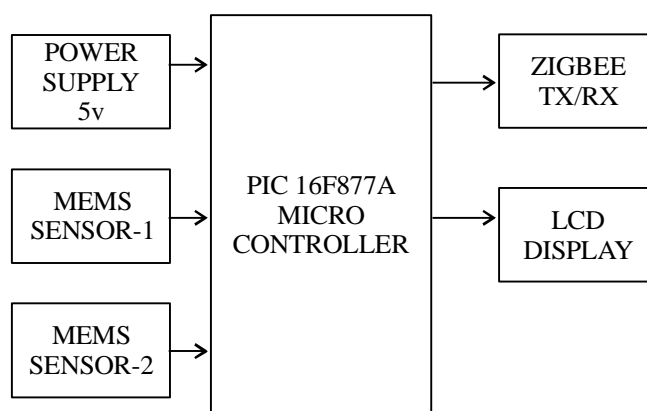


Fig. 1: Glove section



Fig. 2: Mobile section

Hardware specifications

PIC 16F877A Micro controller

The PIC16F877A CMOS FLASH-based 8-bit micro controller is upward compatible with the PIC16C5x, PIC12Cxxx and PIC16C7x devices. It features 200ns instruction execution, 256 bytes of EEPROM data memory, self-programming, an ICD, 2 Comparators, 8 channels of 10-bit Analog - to-Digital (A/D) converter, 2 capture/compare/PWM functions, a synchronous serial port that can be configured as either 3-wire SPI or 2-wire I2C bus, a USART, and a Parallel Slave Port.

Mems sensor

Accelerometer sensor can measure static (earth gravity) or dynamic acceleration in all three axis. Application of the sensor is in various fields and many applications can be developed using this sensor. Accelerometer sensor measures level of acceleration where it is mounted this enable us to measure acceleration/deceleration of object like car or robot, or tilt of a platform with respected to earth axis, or vibration produced by machines. Sensor provides 0G output which detect linear free fall. Sensitivity can be adjusted in two ranges. Acceleration is a vector force which has direction and measured in meters per second. Earth produces gravitational acceleration on all objects on earth. By monitoring the three axis acceleration one can measure the level of tilt of any platform.

ZIGBEE

ZigBee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. The ZigBee standard operates on the IEEE 802.15.4 physical radio specification and operates in unlicensed bands including 2.4 GHz, 900 MHz and 868 MHz. The 802.15.4 specification upon which the ZigBee stack operates gained ratification by the Institute of Electrical and Electronics Engineers (IEEE) in 2003. The specification is a packet-based radio protocol intended for low-cost, battery-operated devices. The protocol allows devices to communicate in a variety of network topologies and can have battery life lasting several years.

RESULTS AND DISCUSSION

This paper is mainly use full for bidirectional communication between mute people and normal people. This device is used to translate sign language into speech as well as speech into text. Zigbee wireless technology is used instead of bluetooth .Power consumption is also low. This project has covered almost the requirements further requirements and improvements can easily be done .Improvements can be done when the more advanced technology is available. The output of this project is used for deaf and dumb people who were educated only. This drawback will be enhanced by future developments.



Fig. 3: The hardware of hand gesture reorganisation

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