FINGER GESTURE VOCALIZER

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ABSTRACT

Sign language is a natural way for communication between normal and dumb people, but often they find difficulty in communicating with normal people as we don't understand their sign language. In this manner, there dependably exists a language boundary. To limit this obstruction, we propose a gadget which can change over their hand motions into voice which a typical individual can get it. This gadget comprises of a Wireless Glove, comprising of flex sensors and accelerometer. These sensors sense the development of hands and fingers. This framework comprises of a discourse synthesizer circuit which changes over these developments of hand into ongoing discourse yield and a showcase will give the content for the relating signal. The content and voice yield being in English. In this way, this gadget gives effective method for correspondence to both hard of hearing moronic and typical individuals.

Signal acknowledgment is a theme in software engineering and dialect innovation with the objective of translating human motions by means of scientific calculations. Signals can begin from any real movement or statehowever regularly start from the face or hand. Current concentrates in the field incorporate feeling acknowledgment from face and hand signal acknowledgment. Clients can utilize straightforward signals to control or collaborate with gadgets without physically contacting them. Numerous methodologies have been made utilizing cameras and PC vision calculations to translate gesture based communication. Be that as it may, the distinguishing proof and

acknowledgment of stance, walk, proxemics, and human practices is likewise the subject of motion acknowledgment procedures. Motion acknowledgment can be viewed as a route for PCs to start to comprehend human non-verbal communication, in this manner fabricating a more extravagant scaffold among machines and people than crude content UIs or even GUIs (graphical UIs), which still farthest point the larger part of contribution to console and mouse.

1. INTRODUCTION

In today's world, there is a continuous demand for automatic appliances with the increase in level of material comfort; there is a sense of urgency for developing circuits that would ease the complexity of life. The communication between audio-vocally impaired people poses a much tedious task. They, throughout the world use sign language to communicate with others; this is possible for those who have undergone special trainings. Common people face difficulties to understand the gesture language. To overcome these real time issues, Gesture Vocalizer system is developed. Whenever the proposed system senses any gesture, it plays corresponding recorded voice. The main purpose of this project is to present a system that can translate real time finger spelling of the American Sign Language into text. It improves the communication of people with hearing disability. Our system is integrated into a glove that works by sensing the hand movements when making gestures from sign language alphabet, and then it recognizes data and transmits it wirelessly to a PC

through internet and displays the corresponding information. In our paper we believe that, with the employment of glove, signs can be created with more accuracy and better consistency. Having a glove also would enable us to practice sign language without having to be next to a computer. The sign language glove appears to be a convenient aid in communication with the deaf.

2. WORKING

2.1 BLOCK DIAGRAM
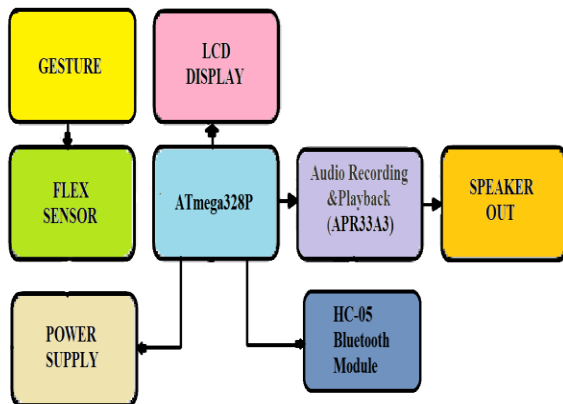
2.2 CIRCUIT DIAGRAM
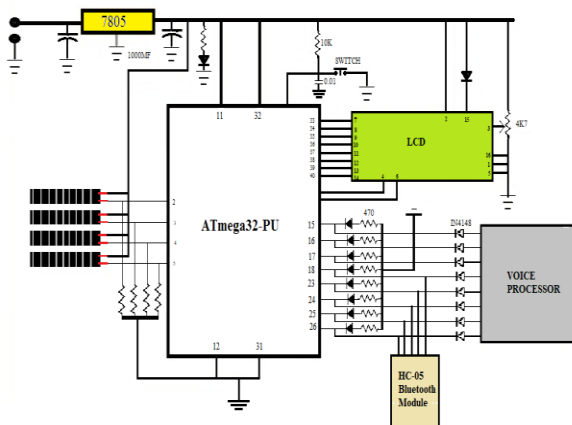
3.HARDWARE DESIGN &SELECTION CRITERIA OF HARDWARE

3.1 Specifications

ATmega328P

- 28-pin AVR Microcontroller
- Flash Program Memory: 32 kb
- EEPROM Data Memory: 1 kb
- SRAM Data Memory: 2 kb
- I/O Pins: 23
- Timers: Two 8-bit / One 16-bit
- A/D Converter: 10-bit Six Channel
- PWM: Six Channels
- RTC: Yes with Separate Oscillator
- MSSP: SPI and I²C Master and Slave
- USART: Yes
- External Oscillator: up to 20MHz

APR33A3

- Operating Voltage Range: 3V ~ 6.5V
- Single Chip, High Quality Audio/Voice Recording & Playback Solution
  - No External ICs Required
  - Minimum External Components
- User Friendly, Easy to Use Operation
  - Programming & Development Systems Not Required
- 680 sec.(11 Minutes) Voice Recording Length in APR33A3-C2
- Powerful 16-Bits Digital Audio Processor.
- Nonvolatile Flash Memory Technology
  - No Battery Backup Required
- External Reset pin.
- Powerful Power Management Unit
  - Very Low Standby Current: 1uA

- o Low Power-Down Current: 15uA
  - o Supports Power-Down Mode for Power Saving
- ❖ Built-in Audio-Recording Microphone Amplifier
  - o No External OPAMP or BJT Required
  - o Easy to PCB layout
- ❖ Configurable analog interface
  - o Differential-ended MIC pre-amp for Low Noise
  - o High Quality Line Receiver
- ❖ High Quality Analog to Digital and PWM module
  - o Resolution up to 16-bits

4. SOFTWARE DESIGN & SELECTION CRITERIA OF SOFTWARE

The Arduino incorporated advancement condition (IDE) is a cross-stage application (for Windows, macOS, Linux) that is composed in the programming dialect Java. It is utilized to compose and transfer projects to Arduino board. The source code for the IDE is discharged under the GNU General Public License, adaptation 2. The Arduino IDE underpins the dialects C and C++ utilizing exceptional guidelines of code organizing. The Arduino IDE supplies a product library from the Wiring venture, which gives numerous regular info and yield systems. Client composed code just requires two essential capacities, for beginning the portray and the fundamental program circle, that are incorporated and connected with a program stub principle() into an executable cyclic official program with the GNU apparatus chain, additionally included with the IDE dispersion. The Arduino IDE utilizes the program overdue to change over the executable code into a content document in hexadecimal encoding that is stacked into the Arduino board by a loader program in the board's firmware.

Open Arduino IDE make sure that u have changed your signature as per targeted AVR ATmega

1. Open Arduino IDE
2. File > Examples > Arduino ISP
3. Select Arduino328 from Tools > Board
4. Select your serial port.
5. Burn in your Arduino board.
6. Select Arduino as ISP from Tools > Programmer
7. Select Burn Boot loader

4.1 ALGORITHM

Step 1: First we have to analyses the movement through flex sensor

Step 2: Now the signal is sent from the sensor to the controller section i.e microcontroller

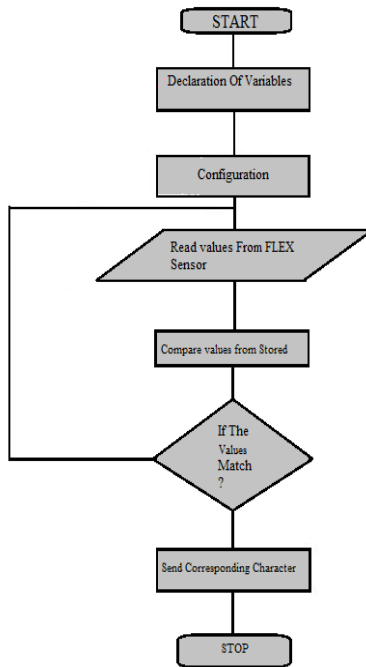**Step 3:** Take predefined sign languages

Step 4: The microcontroller detects the hand gestures.

Step 5: then microcontroller sends the signal to Audio Processing and LCD unit

Step 6: The message is displayed on LCD

Step 7: The message is heard through the speaker

4.2 FLOWCHART

5. RESULT ANALYSIS

5.1 Result given out by the system on LCD

Figure: Result 1

The proposed system which is designed shows the:

1. Simulation output of sensing the gesture of hands
2. The sensor provides the data on the LCD which has been given up by the flex sensor through hand gesture.
3. The results of the project are accurate and hence can be used by the deaf and dumb person for communicating with fellow person.

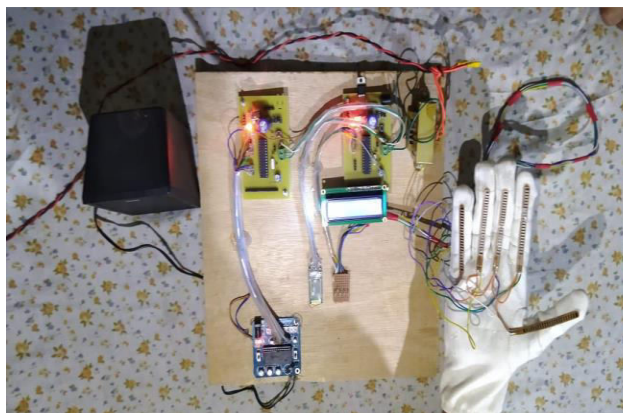### 4.2 Gestures incorporated in this project

Figure: I am hungry

Figure: Hi! How are You?

Figure: I want water

Figure: Help me

Figure: Please go

5.2 Second result given by the Bluetooth module by connecting the circuit with Bluetooth of the mobile phone

Figure: Result 2

The input given on the app is projected on the LCD of the circuit and audio output comes through the speaker. The app is included in the project so that the normal person could communicate with deaf or blind peoples.

➢ The result displayed changes according to the input given by the normal person through the app.

➢ It helps in communicating with the handicapped through visual and audio output.

6. CONCLUSION

This system is useful for dumb, deaf and blind people to communicate with one another and with the normal people. The dumb people use their standard sign language which is not easily understandable by common people and blind people cannot see their gestures. This system converts the sign language into voice which is easily understandable by blind and normal people. The sign language is translated into some text form, to facilitate the deaf people as well. This text is display on LCD. In order to improve and facilitate the more gesture recognition, motion processing unit can be installed which comprises of Gyroscope as well and with the help sensor fusion technique, we can accommodate a number of other gestures as well for better and efficient communication.

6. FUTURE SCOPE

- Designing of wireless transceiver system for "Microcontroller and sensor based gesture vocalizer"
- Perfection in monitoring and sensing of dynamic movement involved in "Microcontroller and sensor based gesture vocalizer"
- Designing of whole jacket, which would be capable of vocalizing the gesture and movements of animals
- Virtual reality application e.g. ,replacing the conventional input devices like joy

sticks in video games with the data gloves.

- The robot control system to regulate machine activity at remote sensitive sides

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