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Sign to Speech Conversion for Dump People

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Abstract Sign language is the way through which dump people can communicate. It has been observed that, impaired people find it very difficult to interact with the society. Normal individuals can't able to understand their sign language. To bridge this gap, the proposed system acts as the mediator between impaired and normal people. This System uses Flex Sensor to capture the signs. Flex Sensors are connected to the ARDUINO Board. The Flex Sensor captures dynamic gesture. The propose method extracts feature from the sign through Flex Sensor and then transmit that sign signals through Bluetooth to the Android Mobile. This integrated feature improves the performance of the system, the system serves as an aid to dump people.

Keywords — Android mobile, ARDUINO Board, Bluetooth, Dump people, flex sensor, transmitter,

I. INTRODUCTION

Now a days, embedded system emerging as an important trend in all applications. More recently developed embedded applications are changing our lifestyle in a smart way. Sign language is an expressive and natural way for communication between normal and dump people, it means information majorly conveys through the hand gesture. The intension of the sign language translation system is to translate the normal sign language into speech and to make easy contact with the dump people. 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 dump people that uses gestures instead of sound to convey or to express fluidly a speaker's thoughts. A gesture in a sign language is a particular movement of the hands with a specific shape made out of them. The main aim of this project is to present a system that can efficiently translate Sign Language gestures to both auditory voice and text. Several languages are being spoken all around the world. So, this system aims to give the voice output in various regional languages. Here we have used English language.

A. PURPOSE

- To bridge the gap between normal people and impaired people.
- To communicate effectively through android.
- Conveying the related information about their needs

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II. BLOCK DIAGRAM

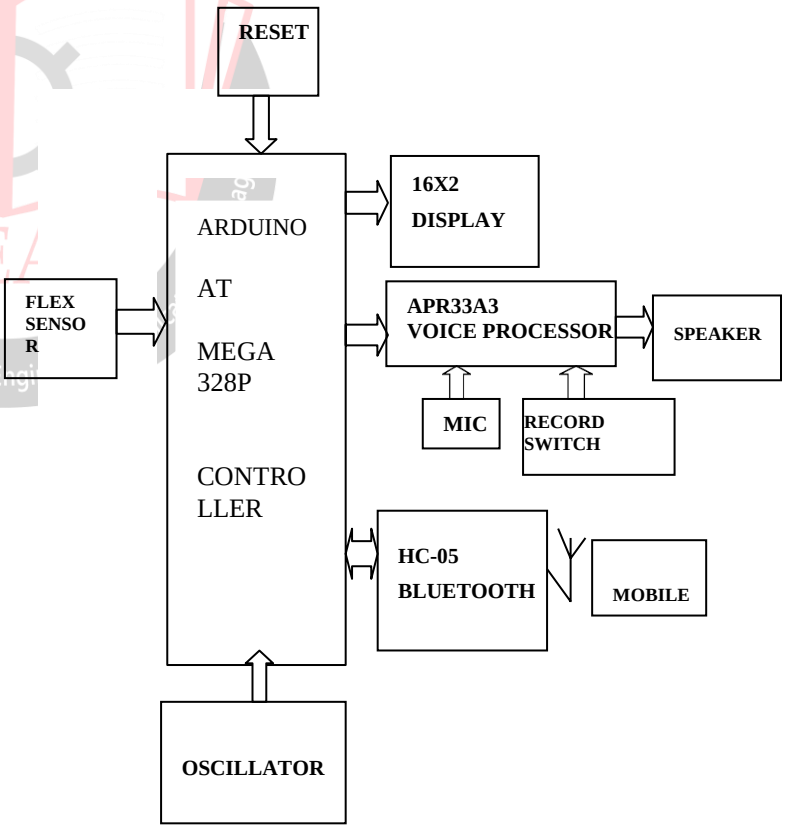

Fig: Block diagram of sign to speech conversion for dump people

POWER SUPPLY BLOCK

AC SUPPLY

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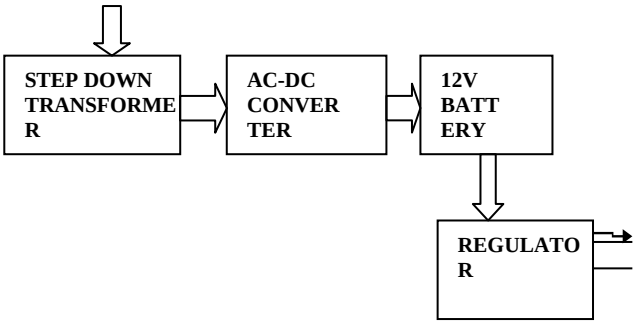


The main working principle behind this work is conversion of sign to speech. All the digital components in this circuit uses a 5v DC supply. A step down transformer reduces the voltage level from 230V AC to 12V AC supply. This is voltage is then converted into DC using full wave center tapped rectifier. IC7805 voltage regulator is used to maintain constant 5V DC.).

BLOCK DIAGRAM DESCRIPTION

The block diagram consists of transformer, rectifier, regulator, LCD display, Arduino, flex sensor, voice module and a speaker. The step-down transformer converts the incoming 230V AC supply to 12V AC. The rectifier converts the 12V AC transformer secondary voltage into pulsating DC voltage. To smooth DC power, additional filter circuits are required. So, the rectified output is filtered with the help of a capacitor to produce pure DC. A regulator is connected to adjust the output voltage as per the requirements. The Arduino Uno is a microcontroller board based on the ATmega328. A simple flex sensor 2.2" in length. As the sensor is flexed, the resistance across the sensor increases. LCD's operate as a light "valve", blocking light or allowing it to pass through. An image in an LCD is formed by applying an electric field to alter the chemical properties of each LCC (Liquid Crystal Cell) in the display in order to change a pixel's light absorption properties. The aPR33A series are powerful audio processor along with high performance audio analog-to- digital converters (ADCs) and digital-to- analog converters (DACs). The aPR33Aseries incorporates all the functionality required to perform demanding audio/voice applications. HC-05 embedded Bluetooth serial communication module (can be short for module) have two work modes: order-response work mode and automatic connection work mode. And there are three work roles (Master, Slave and Loopback) at the automatic connection work mode.

III HARDWARE DESCRIPTION

A. FLEX SENSOR

Flex sensors are passive resistive devices that can be used to detect bending or flexing. The flex sensor shown in this article is a bi-directional flex sensor that decreases its resistance in proportion to the amount it is bent in either direction.

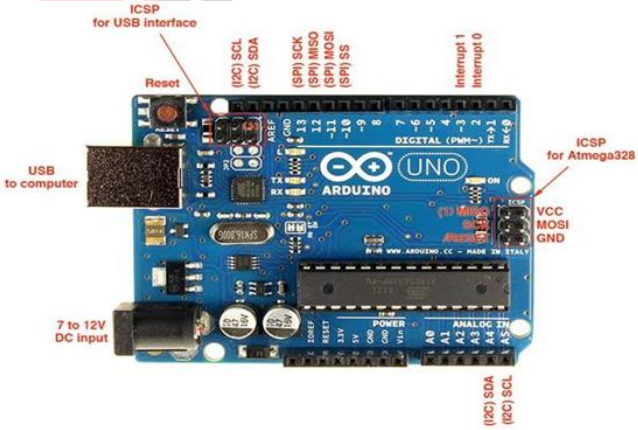
Fig: Flex Sensor

B. ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to- serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. The Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.

ARDUINO PIN DIAGRAM



The board has the following new features:

- 1.0 pin out added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible with both the board that uses the AVR, which operates with 5V and with the Arduino Due that operates with 3.3V. The second one is a not connected pin that is reserved for future purposes.
- Stronger RESET circuit.
- ATmega 16U2 replace the 8U2.

"Uno" means one in Italian and is named to mark the upcoming release of Arduino

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1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards.

C. MEMORY:

The ATmega328 has 32 KB (with 0.5 KB used for the boot loader). It also has 2 KB of SRAM and 1 KB of EEPROM (which can be read and written with the EEPROM library).

D. INPUT AND OUTPUT:

Each of the 14 digital pins on the Uno can be used as an input or output, using pin mode, digital write, and digital read functions. They operate at 5 volts. Each pin can provide or receive a maximum of 40 mA and has an internal pull-up resistor (disconnected by default) of 20-50 K Ohms.

E. aPR33A3 (RECORDING VOICE IC):

Today's consumers demand the best in audio/voice. They want crystal-clear sound wherever they are in whatever format they want to use. APLUS delivers the technology to enhance a listener's audio/voice experience. The aPR33A series are powerful audio processor along with high performance audio analog-to-digital converters (ADCs) and digital-to-analog converters (DACs). The aPR33A series are a fully integrated solution offering high performance and unparalleled integration with analog input, digital processing and analog output functionality. The aPR33A series incorporates all the functionality required to perform demanding audio/voice applications. High quality audio/voice systems with lower bill-of-material costs can be implemented with the aPR33A series because of its integrated analog data converters and full suite of quality-enhancing features such as sample-rate convertor. The aPR33A series C2.0 is specially designed for simple key trigger, user can record and playback the message averagely for 1, 2, 4 or 8 voice message(s) by switch, It is suitable in simple interface or need to limit the length of single message, e.g.toys, leave messages system, answering machine etc. Meanwhile, this mode provides the power-management system. Users can let the chip enter power-down mode when unused. It can effectively reduce electric current consuming to 15uA and increase the using time in any projects powered by batteries.

F. VOLTAGE REGULATOR

The LM 78XXX series of the three terminal regulations is available with several fixed output voltages making them useful in a wide range of applications. One of these is local on card regulation. The voltages available allow these regulators to be used in logic systems, instrumentation and other solid state electronic equipment. Although designed primarily as fixed voltage regulators, these devices can be used with external components to obtain adjustable voltages and currents. The LM78XX series is available in aluminum to 3 packages which will allow over 1.5A load current if adequate heat sinking is provided. Current limiting is included to limit the peak output current to a safe value. The LM 78XX is available in the metal 3 leads to 5 and the plastic to 92. For this type, with adequate heat sinking. The regulator can deliver 100mA output current.

IV CIRCUIT DIAGRAM

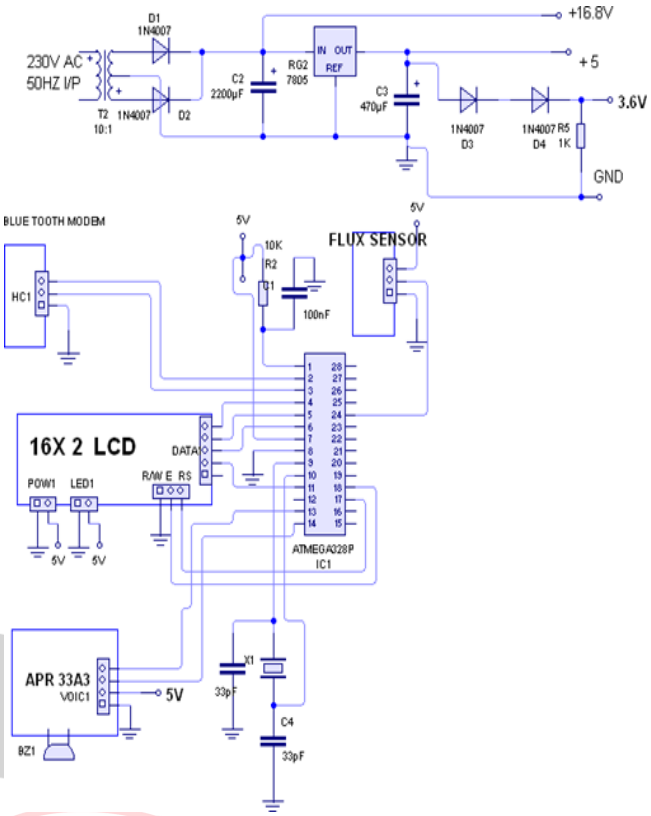

Fig: Circuit Diagram

V KIT PREVIEW

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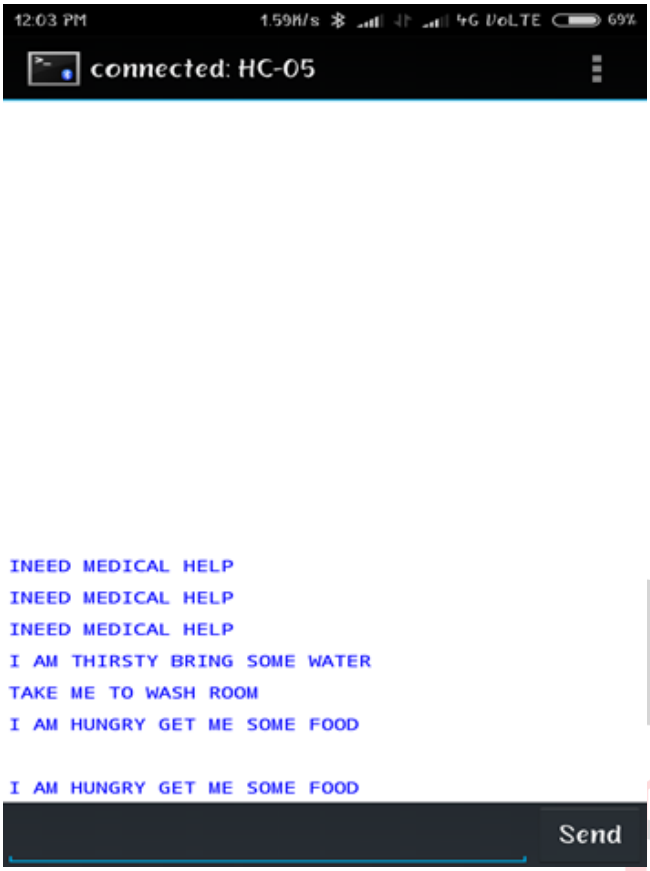
A. MESSAGE BOX



VI CONCLUSION

This methodology interprets sign language into speech. The sign language interprets into some text kind displayed on the android mobile. The foremost characteristic of this project is that the gesture recognizer may be a stand alone system, that's applied in commonplace of living. It is useful for speech impaired and paralyzed patient means those do not speak properly.

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