Smart Glove for Deaf and Dumb

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Abstract— The aim of this paper is to help the deaf and dumb people. It is very compact setup that can be easily set up on the gloves. It is light weight as well so it won't be a problem for the differently able to keep on wearing it all through the day. It basically aims on converting the sign language into text as well as audio output. Along with this there is provision to check the health of the person which includes heartbeat, body temperature and sweat secretion. Besides this global positioning system is included to track the person which works for 24 hours a day. In case of emergency the person can send a message to the registered guardian. All these features will help differently able to get along with the normal people easily and grow equally. It is also economical and hence a large group of people can take advantage of this.

Key words: Smart Glove, GPS, GSM, GSR, Thermometer, Heartbeat Sensor

I. INTRODUCTION

Humans need to communicate in order to live, grow, exchange ideas and feelings. This can be done either verbally or non verbally. For those people who are deaf and mute, sign language is a boon. But this boon is not easy for normal people to understand so our project gives anvisual and audio output in order to make it easy for everyone. Along with this monitoring of their health will be easier. For safety purpose tracking their position is also made possible.

II. LITERATURE REVIEW

There were certain attempts made in the past in order to convert gesture into speech. Some attempts were made with the help of CMOS camera or leaf switches based gloves. These faced the problems of coordination with real time events and lightings.

III. PROPOSED IDEA

This idea aims to help the mute and deaf people to communicate and express their thoughts with the help of flex sensors. Different messages are pre-recorded for various sign made with the fingers. These messages will be displayed on the LCD screen as well as can be heard on speakers. Certain sensors such as temperature sensor, GSR and heart rate sensor are used to monitor the health as well. GPS allows to track the position and GSM allows to send message in case of emergency.
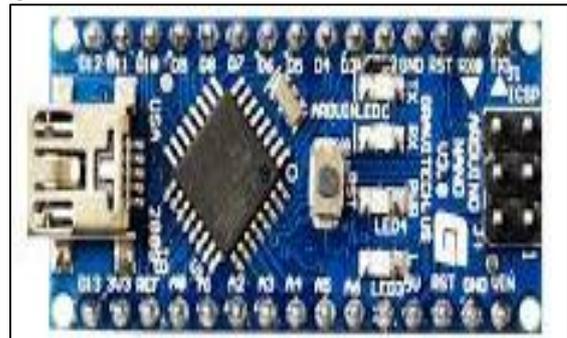
IV. COMPONENTS USED

- Aurdino Nano
- Flex Sensor
- GPS
- GSM
- GSR
- Heart Rate Sensor
- Thermometer
- Accelerometer
- LCD

A. Aurduino Nano

Arduino boards are widely used in robotics, embedded systems, and electronic projects where automation is an essential part of the system. These boards were introduced for the students and people who come with no technical background.


B. Flex Sensor

Flex sensors are passive resistive devices that can be used to detect bending or flexing. These bending are fed with different messages. Therefore whenever there is change in the resistance the system gives the message assign to it as output.
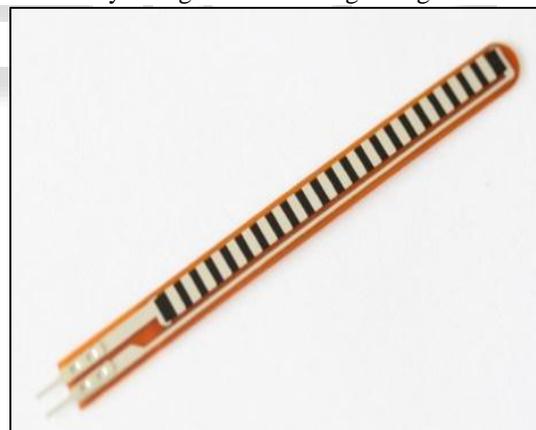
C. GPS (Global Positioning System)

It is a satellite-based radio navigation system. It provides information about the position and time to the GPS receiver unless there is any obstacle between line of sight to four or more satellites.
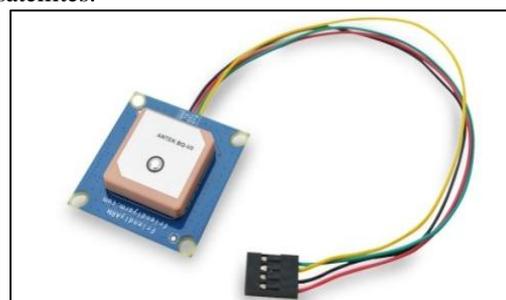
D. GSM (Global system for Mobile)

GSM module is used to setup communication between mobile and the GSM system. This uses TDMA technique for its operation.
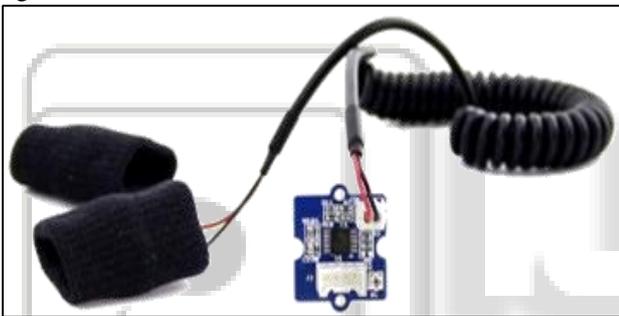

E. GSR (Galvanic Skin Response)

It is a method of measuring electrical conductance of the skin. Strong emotions can lead to sweat secretion by sweat glands. It can be done by simply attaching two electrodes to two fingers on one hand.

F. HEART RATE SENSOR

Principle of operation is photo phlethysmography. It measures the change in volume of blood through any organ of the body which causes a change in the light intensity through that organ.


G. Accelerometer

A device that measures proper acceleration which is not same as rate of change of velocity. An accelerometer on earth measures earth's gravity as 9.81 m/s whereas on the free falling body measures it as zero.

H. LCD (Liquid Crystal Display)

LCD ia a mixture of solid and liquid. It uses liquid crystal to produce visible images. Liquid crystal display consists of an array of tiny segments (called pixels) that can be manipulated to present information.

V. COMPARISON

- Initially the conversion of gesture to text was done with the help of CMOS CAMERA. In this the conversion was made possible by transmission of image data by UART serial PORT.
- Another attempt for this was leaf switches based gloves. In this the switches used were thin as leaf and was considered to be at 5V when left normal and 0V when bent. Then accordingly the output was obtained.
- Copper plate based glove is another attempt in this. This glove can be made d) using small metal strips that are fixed on the five fingers of the glove. The copper strips indicate a voltage level of logic 1 in rest position. But when they come in contact with the ground plate, the voltage associated with them is drained and they indicate a voltage level of logic 0. Thus necessary output is obtained.

VI. BLOCK DIAGRAM
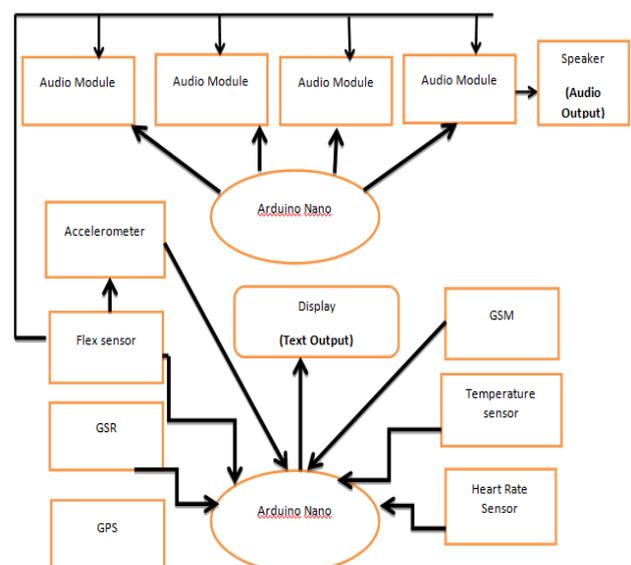
VII. CONCLUSION AND FUTURE SCOPE

This project is very useful for the deaf and mute people as they will be able to communicate with others. The difficulty of understanding the sign language by common people is resolved.

This project doesn't deal with the facial expression which is a crucial thing to study the emotions and gestures of the people. So this can be further implemented to level up the project. Also the size can be reduced to make it more users friendly and portable.

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