Smart Glove For Deaf And Dumb Patient

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ABSTRACT

In this paper we represent smart glove for deaf and dumb patient. About nine billion people in the world are deaf and dumb. The communication between a deaf normal visual people. This creates a very little room for them with communication being a fundamental aspect of human life. The blind people can talk freely by means of normal language whereas the deaf-dumb have their own manual-visual language known as sign language. Sign language is a non-verbal form of intercourse which is found amongst deaf communities in world. The languages do not have a common origin and hence difficult to interpret. The project aims to facilitate people by means of a glove based communication interpreter system. The glove is internally equipped with five flex sensors. For each specific gesture, the flex sensor produces a proportional change in resistance. The processing of these hand gestures is in Arduino uno Board which is an advance version of the microcontroller and the LABVIEW software. It compares the input signal with predefined voltage levels stored in memory. According to that required sound is produced which is stored is memory with the help of speaker. In such a way it is easy for deaf and dumb to communicate with normal people.

Keywords – Deaf And Dumb Patient , Sign Language, Flex Sensor

I.   INTRODUCTION

General, deaf people have difficulty in communicating with others who don't understand sign language. Even those who do speak aloud typically have a "deaf voice" of which they are self-conscious and that can make them reticent. The Hand Talk glove is a normal, cloth driving glove fitted with flex sensors along the length of each finger and the thumb. The sensors output a stream of data that varies with degree of bend. The output from the sensor is analog values it is converted to digital and processed by using microcontroller and then it will be transmitted through wireless communication (RF)[3], then it will be received in the receiver section and processed using responds in the voice using speaker. In this paper flex sensor plays the major role, Flex sensors are sensors that change in resistance depending on the amount of bend on the sensor. They convert the change in bend to electrical resistance - the more the bend, the more the resistance value. They are usually in the form of a thin strip from 1"-5" long that vary in resistance from approximately 10 to 50 kilo ohms[2]. They are often used in gloves to sense finger movement. Flex sensors are analog resistors. They work as variable analog voltage dividers. Inside the flex sensor are carbon resistive elements within a thin flexible substrate. More carbon means less resistance. When the substrate is bent the sensor produces a resistance output relative to the bend radius

II.   METHODOLOGY

The figure 1 shows the basic circuit diagram of flex sensor. Using flex sensor we measure the change in resistanceMotion Sensors (Flex Sensor) - The flex sensors are the sensors that change in resistance depending

upon the amount of bend on the sensor[8]. They convert the change in bend to electrical resistance. They can be unidirectional and bidirectional. Available in thin strip form. The Flex Sensor patented technology is based on resistive carbon elements. As a variable printed resistor, the Flex Sensor achieves great form-factor on a thin flexible substrate. When the substrate is bent, the sensor produces a resistance output correlated to the bend radius the smaller the radius, the higher the resistance value. Flex sensors has the length from 1 inch to 5 inch i.e. near about 73mm in length and 6.35mm in width. The resistance of the flex sensor varies above or below 550Ω. The main difference between unidirectional flex sensor and bidirectional flex sensor is that, as the unidirectional flex sensor is bent, the resistance increases, while when a bidirectional flex sensor is bent, the resistance decreases. At rest or 00 bend, the resistance of the unidirectional flex sensor is 10KΩ.As it is further bent at 450, the resistance increases according to the bent. At 900 bent, the resistances of the unidirectional flex
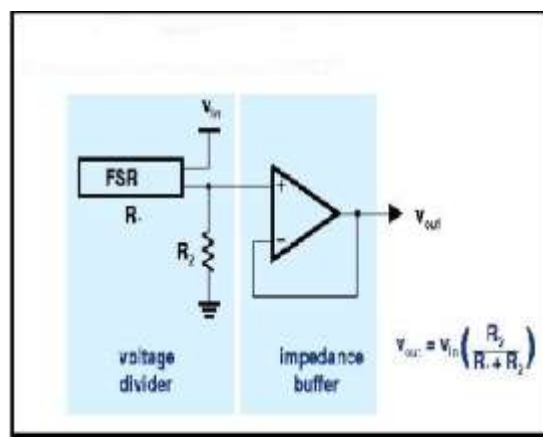

fig 1: Basic flex sensor circuit

sensor ranges from 30KΩ to 50KΩ.[13]

III.   EXPERIMENTATION

Figure 2 shows the American sign language. Using the Sign Language the deaf & dumb people will be able to talk like normal people. Depend upon these sign languages we can able to

convert the signs into letters or words [11]

Fig 2: sign language

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Fig 3: block diagram

The major building blocks of this figure3 are:

1.   Flex sensor

2.   Sign language

3.   Arduino uno board

4.   Deaf and dumb people

5.   LABVIEW software

6.   Speaker

The circuit shown in the figure. It consists of arduino uno board, flex sensor, sign language, signal conditioning of flex sensor, LABVIEW software.

The flex sensor interfaced with the arduino uno board. The voltage change coming from the bending of flex sensor will goes through the arduino board to LABVIEW software and the signal goes to display board and audio signal goes to speaker and sound will generate[9]

IV.   RESULT ANALYSIS

This paper is a useful tool for speech impaired and partially paralyzed patients which fill the communication gap between patients, doctors and relatives.

1. As it is portable, cost effective.

2. Requires low power operating on a single lithium-ion rechargeable battery and having less weight and robust gives patient liberty to carry it anywhere at their will.

3. This paper will give dumb a voice to speak for their needs and to express their gestures

4. Hence this paper is an attempt to make it easy to understand the actions of the dumb people by getting the output in the form of text and voice.

5. The text is also forwarded as SMS via Bluetooth or modem for better convenience and for security purposes.

V. CONCLUSION

The main aim of the paper is to reduce the communication gap between deaf or mute community and normal people. This system is proposed to improve lifestyle of deaf and dumb people. This is also favourable for degrading the communication difference between the blind person and the dumb person. All over the paper is effective and efficient because it is using LABVIEW.

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