

Motion Based Message Conveyor for Physically Disabled People

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Abstract - As we were thinking about the idea for our project, during the search we found the statistics of disability population in our country. So, we came to know that the count of physically disabled people is very high. That's why we decided to do this as our project. We are using an accelerometer as the main part of our project. It is the device which is used to detect the motion. We will put the accelerometer on any movable body part of person who is physically challenged. If he got some problem he will move the body part which contain accelerometer in particular direction as per the programming. Device will detect the motion and will give an output signal to the Arduino Uno. Arduino will detect input as per the programming done for the direction of accelerometer. After detection of motion it will give output on LCD display as per the program. E.g. "Some problem". So, a buzzer will give an alarm for emergency help. People nearby the disabled one will come to know the problem and will try to solve it. An additional feature we are giving to map the temperature of the body, especially considering the patients.

Keywords: Accelerometer, Arduino Uno, temperature of body.

1. INTRODUCTION

Population of India is the second highest in the world. The population of disabled people is also very high. If we observe in the surrounding, there are lots of people who have some type of disability. A survey was carried out by census in 2001 to obtain disability population in India. This survey revealed that the physical disability is the second highest type of disability observed in people of India. This reason was enough for us to start working on this topic.

We are making a project known as motion based message conveyor. As the name suggests there will be motion of device to send an emergency message. We are using a 3-axis accelerometer which is the device which has 3 axes namely X, Y and Z. Due to this it can achieve greater accuracy with small movement also. This accelerometer will be placed on the movable part of the body of person with disability. If the person has any problem he will move his body part containing accelerometer to a particular direction. The change in angle will be observed by accelerometer. So, the angle of tilt will be forwarded to the Arduino Uno. This angle of tilt will show the direction of tilt of accelerometer.

Every movement of the accelerometer has given a different meaning with the messages programmed using

Arduino Uno. E.g. "Some Problem". This message will be transmitted by using an RF transmitter towards the receiver using wireless transmission. Receiver will receive the message and will be decoded in parallel inputs. These inputs will be given to 8051 microcontroller for further movement. A 16*2 LCD display will be connected to the microcontroller which will be used to display the message as per the program. Not only the message will be displayed but, an alarm will be given by using a buzzer which will be connected to 8051 microcontroller. This alarm is for the people who are the caretakers of the patient suffering from disability. Another feature we are giving is a temperature sensor will be connected to the Arduino Uno which will continuously measure the body temperature and will display it on LCD display.



2. LITERATURE SURVEY

Title: - Hand Gesture Recognition Application for Physically Disabled People.

Author: - D. Vishnu Vardhan, P. Penchala Prasad. Assistant Professor, Department of ECE, JNTUA College of Engineering Pulivendula, Andhra Pradesh, India.

Review of author: - This paper has completely explained about the hand gesture recognition. An electronic hand glove has been made for the people who are dumb or suffering from Quadriplegia and paraplegia, diseases caused due to the injuries to the spinal cord. In this glove 5 accelerometer sensors have been used on each and every

finger of the glove. Due to this they give more accuracy in very small movements of the fingers also. The accelerations of a hand motion in three perpendicular directions are detected by accelerometers and acceleration values were transmitted to microcontroller. Different hand gestures were given the different messages which were converted into voice messages using audio module.

Title: - Motion Based Message Conveyer for Paralytic/Disabled People.

Author: - Arpit Verma, Nitish Kapila, Narsingh Rathore, Aakash Prajapati.
B.Tech Students Department of ECE SRM University NCR Campus Modinagar

Review of author: - The accelerometer outputs constant analog voltage levels by recording the change in X and Y direction. These voltages are sent to the comparator IC which compares it with the references voltages that have been set via variable resistors attached to the IC. The levels can be set between any two voltages. Every voltage generated by the accelerometer is compared with these set voltages and an analog 1 or 0 signal is generated by the comparator IC. The analog signal so generated is fed as input to the encoder IC. Encoder converts that parallel analog signal waveform into serial analog signal waveform which is compatible for transmission. Push button which is attached with the transmitting pin enables transmission of the signal. The coded data will be passed onto the RF module only when the button is pressed. This button helps in making sure that no data is transmitted unless required. Working frequency of RF is 315 MHz. The receiver receives the signal from transmitter, demodulates it and passes it to decoder IC. Original data bits are recovered by decoding the signal received by the decoder. Decoder converts the serial waveform to parallel waveform which is suitable for microcontroller use. The input is a serial coded modulated waveform while the output is parallel. The parallel binary data from the encoder is fed to the microcontroller. After comparison with old statistics, the microcontroller gives output towards the LCD.

3. BLOCK DIAGRAM:-

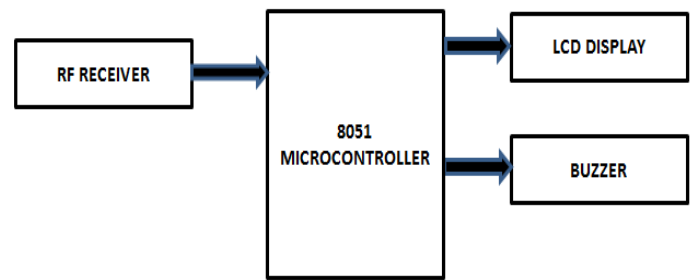
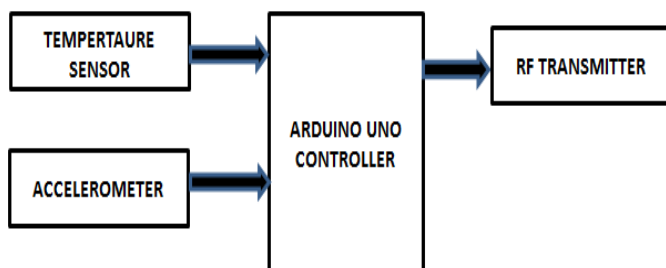


Fig. Block diagram

As we observe in the block diagram, first one is the transmitter of our device which contains four blocks, which are as follows:

Arduino Uno, accelerometer, temperature sensor and RF transmitter. Arduino Uno plays an important role in our device, as it is the microcontroller used to control the various actions performed by our device. We are using a 3 axis accelerometer which will gather the readings of changing angle of the device and convey a message as per the programmed instructions. Temperature sensor is used to continuously monitor and display the temperature of the body. All this information is transmitted towards the receiver by using the RF transmitter.

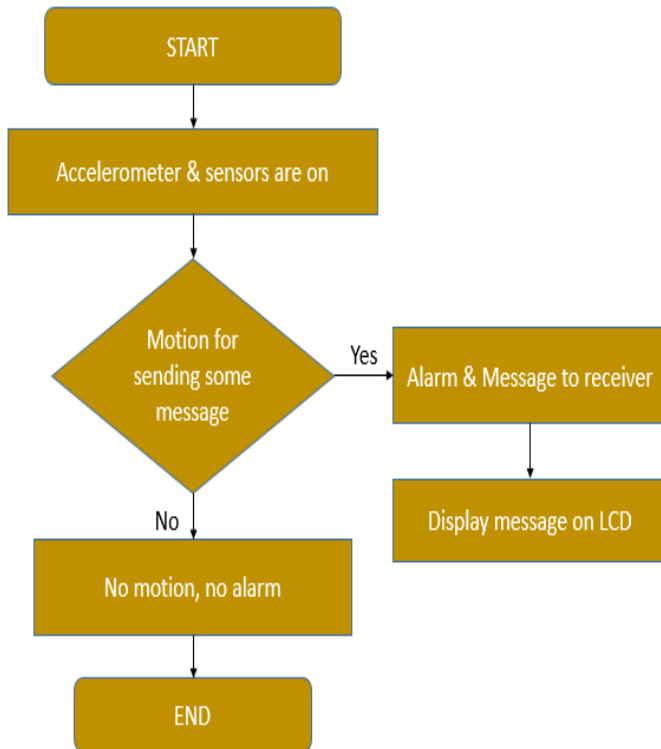
On the receiver side the RF receiver is used to catch the signal and give to the 8051 microcontroller. This microcontroller will read the signal and display the message on the LCD display and the buzzer will be blown with the message.

4. ALGORITHM AND FLOWCHART

4.1. Algorithm

- 1) Start.
- 2) Switch on the Arduino Uno.
- 3) Switch on the LCD and Sensors.
- 4) Initialize the Arduino Uno.
- 5) Initialize temperature sensor.
- 6) All the devices are ON.
- 7) Motion by a patient which send panic signal to the receiver.
- 8) Measured temperature value is send to the receiver.
- 9) If values of sensors exceeds threshold value.
- 10) Buzzer is ON and message display on LCD.
- 11) If there is no reaction from patient then no alarm is ON and message will not be displayed on LCD
- 12) Stop.

4.2 Flowchart



As shown in above flowchart, the process will be as follows- Device will be started first by giving power supply to it. All the sensors i.e. Accelerometer, temperature sensor will be on. To work the device there needs to be the motion of the accelerometer in some of the angle in any direction. There will be programmed instructions for every movement of the accelerometer i.e. for each direction. If there is motion of the device in any direction then there will be an alarm and a programmed message will be sent to the receiver which will be displayed on the LCD display connected to the receiver. If the device is steady i.e. there is no any device motion then there will be no alarm and message. So, process will end.

5. FUTURE SCOPE

1) GSM Technology could be incorporated to achieve greater range. As RF range is limited. With the use of GSM we can send message phone of the doctor or attendant.

2) The project can be further developed into an automatic wheel chair where in wheel chair will be moved just by hand gesture. Also, along with only message transmission other data like body temperature, pulse rate etc. can also be transmitted to the nurse so that a real time record of all patients is maintained.

6. CONCLUSIONS

This project will definitely help the people who are not able to do the full movement of the body. This project is aiming to

fulfil the communication gap between these people and the normal ones. The accelerometer we are using is of 3 axes, so it is very accurate for very small movement also. If a person with disability is hungry, he will do some movement with the body part containing accelerometer. Buzzer will become on and a message will be displayed on the LCD.



7. REFERENCES

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8. BIOGRAPHIES



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