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ASSISTIVE TECHNOLOGY FOR IMPAIRMENTS

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ABSTRACT

Assistive Technology is nothing but the assistant device for people with disabilities. In most of the cases paralytic patients will not be able to convey the message and it is also difficult to move from one place to another. To overcome this problem, we have introduced this technology. Hereby using this technology, we are going to make the patients independent. The conveying of message and moving from one place to another is done by simple tilt action done by the patient hand. And also, patient's health is monitored that is the heartbeat and temperature is continuously monitored and is stored and displayed in the app. All these data can be observed by the caretaker. Thus, by using IOT patient's health can be monitored continuously and effectively.

KEYWORDS

Accelerometer, ZigBee, APR, Wi-Fi module, ARMLPC2148 microcontroller.

1. INTRODUCTION

Among the large number of advancements done in the medical field, very few actually focus on helping patients with disabilities to communicate and make them independent to move from one place to another. Here for an example of physically disable patient we are taking paralytic patient. As we know that paralytic patients who have their whole or one part of the body is disabled to the paralysis attack. Therefore, they can't talk and also can't move from one place to another. Hence, we proposed this technology to overcome this problem.

Our objective is to make disable people independent to communicate and move from one place to another by the simple task of tilting a device located on the patient's hand which is capable of movement. This can be obtained by using the accelerometer sensor. Accelerometer sensor is one which gives the values when its angle is changed. This accelerometer is placed on patient's hand which is capable of movement. Hence when the patient moves his hand in different directions different messages are conveyed and also wheelchair is operated in different direction that patient wants to go. Here we

have two separate blocks that is transmitter block and receiver block. Transmitter block contains the accelerometer sensor and speaker that is used to convey the message. Receiver block contains wheelchair part. Communication between these blocks can be obtained by ZigBee technology.

Monitoring of the patient's health is also very important. Hence in this proposed method patient's heartbeat and temperature is continuously monitored. And all these data are uploaded to the app which is present on caretakers mobile. Hence by using this technology disable people will be independent.

2. RELATED WORK

So many technologies have been developed for disable people in medical field but also, they are not much efficient and effective. For example, for conveying of message to the caretaker by disable people they had introduced a technology by using flux sensor. Here on the basis of gestures the flux sensor is worked and analyzed and different messages are conveyed. But in this method, they had used only to display the message on LCD screen. They had not used speakers to convey the message it is one of the drawbacks because, caretaker cannot stay

near the patient all the time. To solve this problem, we have proposed this technology using loudspeaker so that the caretaker can get to know that patient is trying to convey some message. Here we had replaced flux sensor by accelerometer sensor because accelerometer sensor is somewhat easy to operate by patient when compared to gesture movements.As we can see that so many technologies as arrived for movement of wheelchair that is designed for physically disable people. For example, movement of wheelchair on basis of facial behavior, iris detection and direction that the face is turned. But it is difficult to operate. By keeping all these technologies, we had proposed a combined method for both conveying of message and operation of wheelchair. These can be obtained by using accelerometer sensor. So many health monitoring technologies has been introduced in medical field in form of wrist watches. The same technology as been introduced in our technology.

3. PROPOSED METHOD

The below figure shows the assistive device for paralysis patients. It consists of two blocks namely transmitter and receiver. The communication between transmitter and receiver is done using ZigBee models. Using accelerometer two modes of operations are performed. Firstly, conveying of the message and operation of wheelchair.Firstly, in conveying of message the patient moves his hand in different directions. On the basis of movement of the hand the accelerometer sensor gives different values. On the basis of the values obtained different messages are conveyed. Here to obtain this operation we have used APR (Audio Pre-Recorder). It is one of the devices that stores the voices. These voices are outputted through loudspeaker. Heartbeat sensor and temperature sensors are also used in this technology. These sensors continuously monitor the patient's heartbeat and his temperature and sends the data to the app which is present on caretakers mobile.

Here, for the movement of the

wheelchair we are using DC motors and H-bridge. Because as we know that the DC motors operate only in forward and backward operations. Here, we also require that the wheelchair must move in left and right directions also. Hence, we are using H-bridge to obtain above tasks. The H-bridge is connected to DC motor and microcontroller. The control of the DC motor is done by the H-bridge itself, on the basis of the instructions that are given to the microcontroller by the patient.
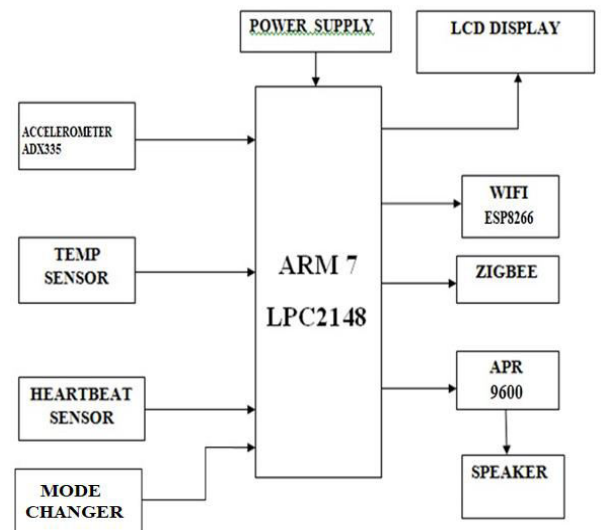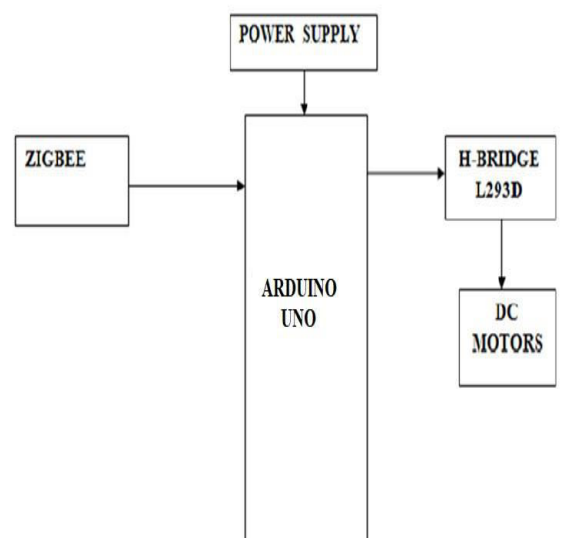

Fig 1: Block diagram of transmitter

Fig 2: Block diagram of receiver

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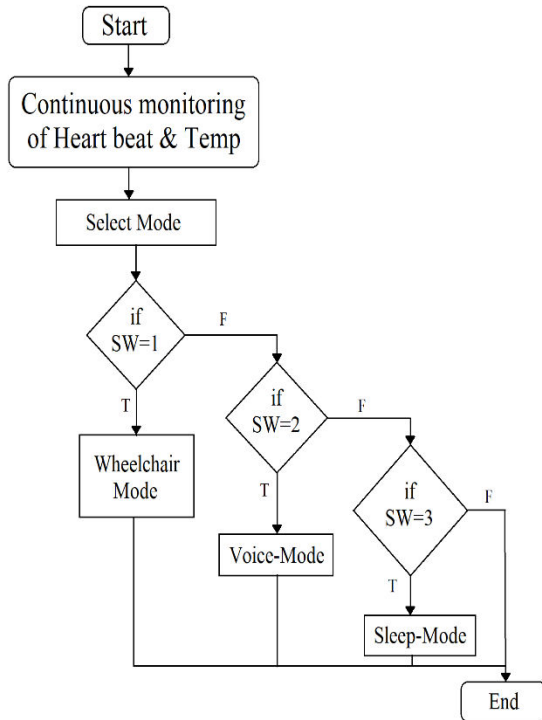www.ijiemr.org

Fig 3: Flow Diagram for selection of modes

4. RESULT

On movement of hand two operations are performed. One is conveying message through loudspeaker and other is movement of wheelchair. These are obtained by tilting hand in different directions.

Different Hand motions to make the wheelchair move in specific directions are as follow:

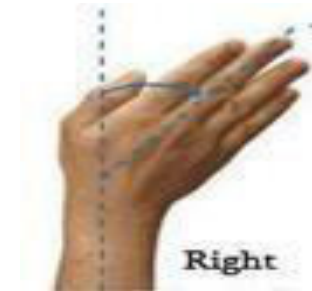**Fig 4: Forward Direction**

Fig 5: Reverse Direction

Fig 6: Right Direction

Fig 7: Left Direction

Below figures shows the temperature and heartbeat data displayed on 16x2 LCD.
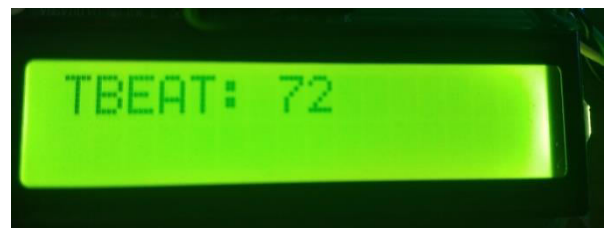

Fig 8: Heartbeat Display on LCD.

Fig 9: Temperature Display on LCD.

These heartbeat and temperature data are uploaded to the app which is present caretakers mobile. These parameters will be continuously monitored and can be

observed by caretaker whenever required. These can be obtained using TCP-IP application which is freely available in internet. These app can be accessed by the IP address that is obtained by Wi-Fi module. The below figure shows the data that is stored and displayed in TCP-IP app in mobile.
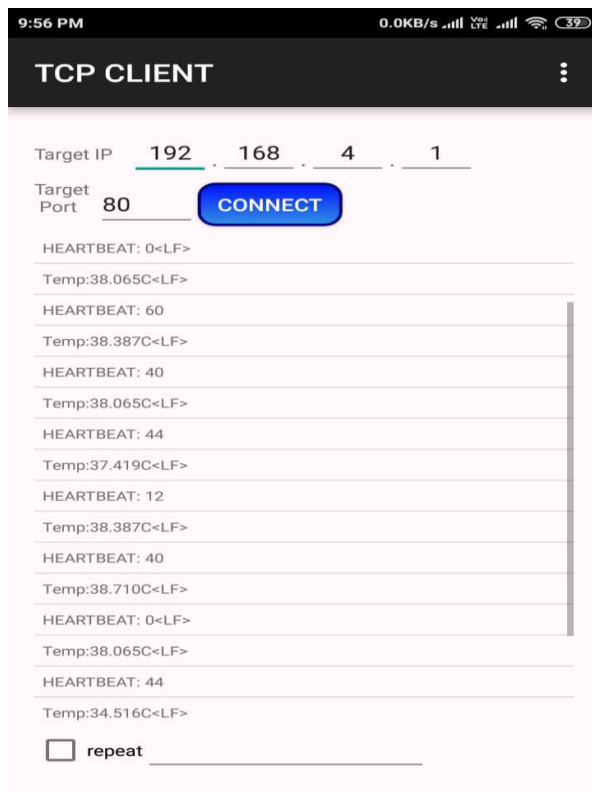

Fig 10: Data displayed in TCP-IP app.

5. CONCLUSION

In this project we have presented a technology for physically disable people to convey message and move one place to another. The main objective of this project was to make physically disable people independent and it has been obtained. As we know that physically disable people like paralytic patients must depend on caretaker to move from one place to another, but by using these technologies they can move from one place to another by them selves just by titling their hand. And also, they can easily convey the messages. Cost is also less when compared to other technologies for this application. Here we had added only four

messages we can also extend it to eight for further application. It is very useful for paralytic patients. Not only for paralytic patients, it can also used for any physically disable people who are not able to walk one place to another place and also for people who can't speak.

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