"HEAD MOVEMENT" Controlled System to Assist the Physically Challenged Using IoT

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Abstract: -- **"Silla de-ruedas" This project describes the design of a simple, wheel chair using head movement system. Heart rate of the subject is measured from the thumb finger using IRD (Infra-Red Device sensors). This instrument employs a simple Opto electronic sensor, conveniently strapped on the finger, to give continuous indication of the pulse digits. The Pulse monitor works both on battery or mains supply. It is ideal for continuous monitoring in operation theatres, I.C. units, biomedical/human engineering studies and sports medicine.This project uses AT89S52 MCU as its controller. By reading all the values of temperature and heart rate will be displayed on LCD. Temperature and heart beat values will be taken and updated in the web server using IoT module interfaced to the controller. This project uses regulated 5V, 500mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac out put of secondary of 230/12V step down transformer.**

Keywords: -Microcontroller, H-Bridge, IoT, Android Application

I.   INTRODUCTION

One-fifth of the estimated global population,i.e. between 110 million and 190 million people, experience significant disabilities. Disabilities of various parts such as eye, ear, hand,leg etc. Limb disability is one of the disabilities which are caused due to various reasons such as deformation by birth, war, disorders such as diabetes. Lower limb of sports person also suffers huge blows while playing and are always at the risk of suffering severe injuries. These injures sometimes may be a permanent disability.Detail explanations of the hardware were discussed in the Design and Implementation part which is mentioned in section 3 and 4.

II. LITERATURE SURVEY

After conducting an intensive literature review, it was found that wheelchairs with stairclimbing capacities can be categorized into two types; the battery powered and the manual powered. Although there are plenty of powered wheelchairs available in the market place, there are limited scholarly reviews published on manual or battery powered wheelchairs. Instead, patent certificates, wheelchair descriptions, and operation manuals are available. Indeed, no peer reviewed literature was found for manual wheelchairs. Some researchers have built scale models or full size prototypes of their designs but little documentation has been published on this type of wheelchairs. Disabled Population in India as per census 2011 – In India out of the 121 Cr population, 2.68 Cr persons are disabled which is 2.21% of the total population.In India, 20% (0.60Crs)of the disabled persons are having disability in movement, 19% are with disability in seeing, and another 19 % are with disability in hearing. 8% has multiple disabilities.Majority (69%) of the disabled population resided in rural areas (1.86 Cr disabled persons in rural areas and 0.81 Cr in urban areas).
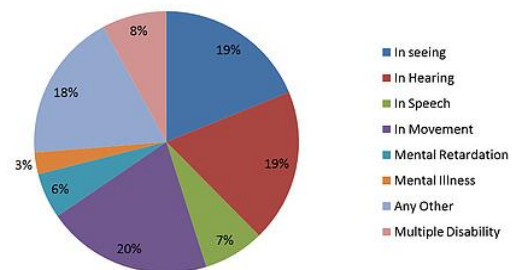

Fig1. Analysis of disabled person

III.DESIGN

Our project can be implemented Hospitals, Remote heart rate monitoring applications, Local monitoring applications, Designed for Home and Clinical. The person who is operating the wheelchair will be equipped with a device which is placed around the neck of the person which is helpful to move the chair forward and reverse direction without any physical or mental stress.For the movement of the neck we are using wireless RIFD technology. The project uses 2 geared motors of 60RPM to drive the prototype of wheelchair, Also this car can take sharp turnings towards left and right directions. We are using the IoT technology to interface the modules. We are also using four switches in the circuit which will be ON when the person will move neck forward and backward. This project uses BCM2835 as its controller. We are using a voice recognition mode. And an app is created to monitor the conditions of the physically disabled person. This Wheelchair will be economical and can affordable to common people.
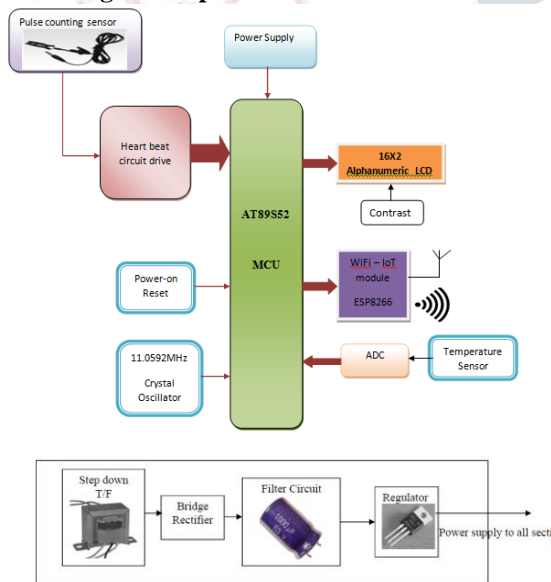
A. Block Diagram Explanation

Fig2. Block diagram of wheelchair

The person who is operating the wheelchair will be equipped with a device which is placed around the neck of the person which is helpful to move the chair forward and reverse direction without any physical or mental stress.The Internet of Things requires a few necessary components to enable communication between devices and objects. Objects need to be augmented with an Auto-ID technology, typically an RFID tag, so that the object is uniquely identifiable. Also, an RFID tag allows the object to wirelessly communicate certain types of information, which leads us to another requirement – the ability to monitor data. The project uses 2 geared motors of 60RPM to drive the wheel chair. This project uses BCM2835 as its controller. We are also using four switches in the circuit which will be ON when the person will move neck forward and backward we have an LCD display which is used to display the body temp and the BP of the person If any fluctuation happens will get an alert message. We have a voice sensor which can be used to send few messages. An H-bridge is a rather simple circuit, containing four switching element, with the load at the center, in an H-like configuration. An accelerometer is a device that measures proper acceleration. Proper acceleration, being the acceleration (or rate of change of velocity) of the chair in its own instantaneous rest frame, is not the same as coordinate acceleration, being the acceleration in a fixed coordinate system

IV.WORKING PRINCIPLE & MODEL

Fig 3.Represents the working principle

At first the person who is sitting in the wheel chair has to Initialize the hot spot and set up one for his prototype. Once if its initialized we can connect it to the prototype and it displays as connected. Then the wheel chair is then controlled using the head band which has four functions in it that is front, back, left and right.These movements is controlled wireless where we are using the RFID technology here. The wireless band is connected to the BCM 2835 microcontroller. It also displays the heat beat rate and the temperature on the LCD display

B. Role of IoT

The main role of IoT in our project is that information or the database of the wheel chair is made enabled to people to look in into the application called "Things view"& the monitored information of the wheel chair to their respective users.. The above process is done via the mobile

communication network, the signals are sent to a web-based software application which is viewed by their respective login users and family members.

C. Model

D. Results

The above diagram shows the representation of graph which is used in "Things View" (an android application) running in phone which indicates each particular data base of day to day.It shows the location ,heart beat and temperature data of the person who is using the wheel chair.

V.COST ANALYSIS

Implementation process of the project can cost around Rs. 60 thousand @ min & as a part of implementation process i.e., cost of wheel chair , the battery and the motors all depends upon how much can the owner afford financially, that includes based on size, quantity &quality (Q&Q). This project can be implemented in the hospitals and clinics. This system can be made highly efficient and effective if stringent environmental conditions are maintained. The setup for maintaining these environmental conditions will be a onetime investment for any real life application. The running cost of this system is much lower as compare to other systems used for the same purpose

VI.CONCLUSION

This Wheelchair will be economic and can affordable to common people. This system can be made highly efficient and effective if environmental conditions are maintained. The setup for maintaining these environmental conditions will be a one-time investment for any real life application. The running cost of this system is much lower as compare to other systems used for the same purpose.

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