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PARAPLEGIC AID: An Assistant for Paraplegic Patient's for their Daily Living Activities

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Abstract: The recent survey of world health organization estimated approximately 5.6 million people were paralyzed representing 1.9 percent of the population roughly 1 among 50. Health surveillance of the paralyzed the hospitals reveal that, there are many exercises, stimulation to safeguard the paralyzed people. But there is not a particular monitoring system to monitor the daily activities of the paralyzed. Paralysis is one among the major neural disorder that causes loss of motion of one or more muscles of the body, wherein depending on the cause, it may affect a specific muscle group or region of the body, or a larger area may be involved. This paper represents the implementation of module for the paralyzed patients. It compromises the use of arduino circuit that enables feature of automation. This paper endows several features such as automation emergency service, nursing service, remainder services, etc.

Index terms: Paraplegic, paralysis, neural, plegia, paraparesis, paralyzed.

I. INTRODUCTION

Paraplegia is a medical condition involving impairment in motor or sensory function of the lower extremities, which is a classification of paralysis the universal term to describe the loss of movement. Paraplegia is the condition where the paralyzed person cannot move the part below the waist or cannot move the legs or trunk. Below are among these types and key description of each:

- **Monoplegia:**

The Monoplegia is a type of paralysis of a single limb. Usually patient having cannot regain their full-potential. Physical therapy is as easy for the treatment for monoplegia.But this physical therapy includes exercise which is more difficult to patients. Monoplegia result to damage to the brain that causes motor function to affect limb.

- **Hemiplegia:**

Hemiplegia is defined as paralysis is caused by brain damage which affect only one side of the body. The main root is stroke, although a traumatic injury or tumour in brain may also led to hemiplegia.

- **Quadriplegia:**

Quadriplegia is also named as Tetraplegia where it is caused by illness or injury which result in total loss of all limbs. This loss is always sensory and motor, that means both sensory and control are not in control.

- **Paraplegia:**

Paraplegia is ruination in motor or sensory function of lower extradite. This diseases is caused by spinal cord or a congenital condition that damage the brain elements of the spinal canal.

II. OUR APPROACH

This system will comprise of use of the Arduino-uno circuit along with the relay circuit connected to it. Android applications is developed which is much easier to use by the patient. As the use of Bluetooth module which is low in cost as compared to ESP8266 and infrared chipset will make the system less costly compared to the system which make use of the sensor. This proposed system will comprise of all the facilities which provide all the feature of automation of home appliances and as various features. An application has to be made for the disabled patients which target the basic needs of living which the patient cannot perform on their own. The application must contain features that indulge patient in a user friendly environment. The application should be designed keeping in mind the patient perspective of their environment. The application must be maintainable and usable as well as easy to use. The application must be dependable. The GUI of the application must be designed keeping in mind that the patient can recognize the services provided to him/her from the application. The application must support different age groups.The application must be completely harmless to children or any age group in terms of security.

III. PROPOSED SYSTEM

This system can not only be used to save electricity, but also to help paralyzed patients to lead their own life without anyone's help. Paraplegia is the condition where the

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paralyzed person cannot move the part below the waist or cannot move the legs or trunk. The proposed application used to control their daily living activities without taking anyone's help by using the app to doing their activity as they are unable to move with their legs.

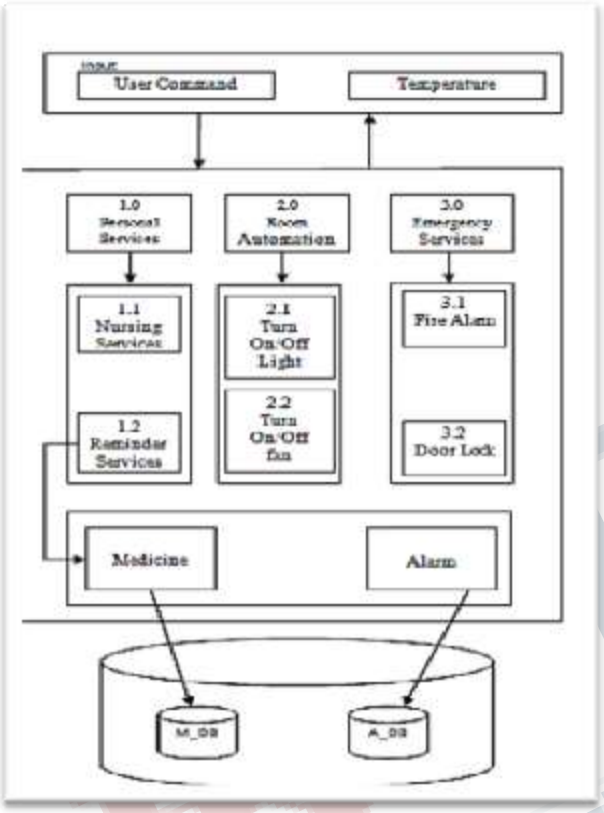

Figure 1: Block diagram of system

IV. IMPLEMENTATION

1. Connecting the Arduino-Uno board to the Bluetooth module:

A connection between the Arduino-Uno and the Bluetooth module is required in order to enable the android to control the Arduino-Uno.First we need to connect the VCC pin of the Bluetooth module to the VCC port in the Arduino-Uno board. Second we need to connect the GND pin of the Bluetooth module to the GND port in the Arduino-Uno board. Lastly we need to connect the receiver of the Bluetooth module to the transmitter of the Arduino-Uno board and the transmitter of the Bluetooth module to the receiver of the Arduino-Uno board. Table sho0000000000000ws the process.

TABLE BLUETOOTH MODULE/ARDUINO CONNECTION

Bluetooth Module (HC-06)	Arduino-Uno Board
VCC pin	VCC port
GND pin	GND port
TX pin	RX port
RX pin	TX port

2. Connecting the Appliances to the Arduino Board:

After everything is set and ready (android phone is connected to the Arduino) connecting the Arduino to the home appliances is needed. Using wires and connector blocks connect the positive end of the home appliance (eg.Portable fan) to the normally open (in this project we want to make the output active high) port in the relay module and the negative end of the appliance to a power source. Then connect the IN port of the same relay module to the wanted Arduino-Uno port.Apply the same for the other appliances only use different relays and different Arduino-Uno Ports. Connect the android phone with the Bluetooth module and now all the connected appliances can be controlled wirelessly using the android device bit number increases. We also simulated the delay performance in the proposed area-efficient adder and conventional carry select adder with 4, 8, 16, and 32-bit respectively.

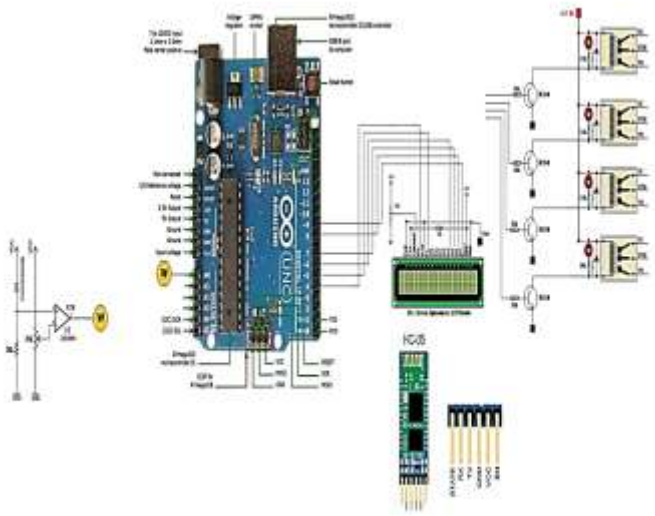

Figure 2: Circuit Diagram of System

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Figure 3: Icon of Paraplegic Aid app

Figure 5: Room Automation

Figure 4: Home Page of the Paraplegic Aid App

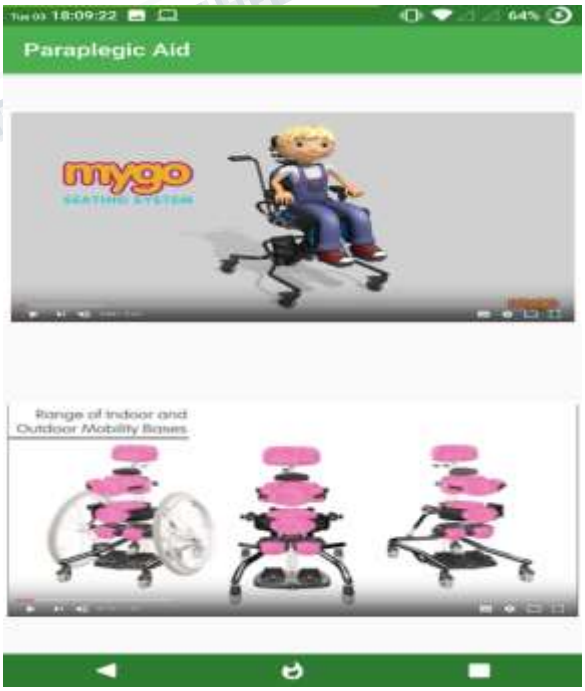

Figure 6: Vedio about Nursing Services

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V. CONCLUSION

In this paper we described the conditions of paraplegic patients and provide the assistant app for handling their daily living activities without taking help of another person.the idea is mainly to make the paraplegic patients to be completely able to use technology for their help.To use android smartphone in an easy assistive manner to overcome the problem faced by them as they do not move their lower body part.

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