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Stroller Controller Using Echo Dot for Kids and Paralysed Children

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Abstract. In this present era parents are busy in their professional life so they do not get sufficient time to take care of their kids or paralysed children. Due to this issue parents become more stressed and will depend on others to take care of their children. These issues can be avoided by introducing a new product. The proposed system is designed by using a stroller with echo dot, an android app and accelerometer.The system is economical and cost effective compare to other existing systems.It makes paralysed children more independent and secure and makes parents job easier. This stroller makes the users more comfortable.

Keywords: Echo dot, Accelerometer, Android App, Ultrasonic sensor, Stroller

1 Introduction

In this present world paralysed children become discomfort during most of the time. Many of the parents and children corresponds to this problem. The main aim of this project is to develop a multipurpose stroller for making children more independent from others. The stroller will be functioned using the voice commands [1] through the echo dot . It is a virtual assistant developed by Amazon which is first used in the Amazon Echo. It is capable of voice interaction, music playback, making to-do lists, setting alarms, playing audio books, providing weather, traffic, sports etc . It also include real-time information such as news and can control several smart devices using home automation system. Echo offers weather reports , stream music from the owner's Amazon Music accounts. It can manage voice controlled alarms and timers. It is used in home automation which can interact with devices from several manufacturers including Belkin, light wave RF, Nest etc. Echo dot supports subscription based and frees streaming services on Amazon and music directly. It allows the users to hear updates on supported sports teams. It can deliver messaging and call. Echo app update brings voice interaction to all Android users, voice assistant. Interfacing of Echo dot along with Node MCU is used in this project. Node MCU is an open source IOT platform and its hardware is based on the ESP-12 module. This project mainly use Android app and relay. Android app controls echo dot in various ways. The users can control echo dot in any situation using this android app. Android app can be control and provide instruction from any corners of the world. Along with android app, relay is also included. It is an electromagnetic switch. It is used in application to turn on and off circuit by low power signal or where several circuits must be controlled by one signal. Relay protects the circuit against the overload.

2 Revıew of Lıterature

Several literatures shown the independent mobility which consists of power wheelchair and manual wheelchair. These wheelchair provides little bit benefits for older and paralysed persons[1]. In this a grammer recoganiation was given so that the persons voice should reach the correct pronunciation so that the device will be able to understand and moreover in the case of voice controlled wheelchair, it will only be benefit for people who are able to speak not for dumb people.

In some cases the android app using bluetooth was introduced in with the person have to use either of the two nodes touch node or voice node. But the relative drawback in this was the person or the patient should be within the specified rang so that he/she can control the wheel cair [2]. Sensor based wheel chair was in use during the recent years in which either the speech or touch screens where introduced [3].
Also in the case of voice and gesture controlled wheelchair, there is also certain limitations. In these both cases there is a dependence on caregivers or family. Independent mobility means less dependence on others [4].
The proposed system is echo dot controlled stroller for kids and paralysed children. Which can be control from anywhere of the world.

The advantages of system are as follows:

- Paralysed children can use this and become more comfort.
- More compact and reliable.
- More secure and economical.
- User friendly and Reduce manpower.

In this system, the Echo dot will give all answers and also move the wheelchair according to the user's purpose. The users get more self satisfaction and entertainment. The kids get more knowledge and feel entertained by the use of Echo dot from this wheelchair. Also by the Android App, it helps the family to know the problem faced by the users of the wheelchair.

3 Proposed System

The systems mainly consist of Echo dot, Relay, Node MCU, ultra sonic sensors and Android app. The system can move according to our needs by giving commands to Echo dot. The Echo dot is controlled by Node MCU. The system can easily control at any corners of the world by using the Android app. The block diagram is given below:

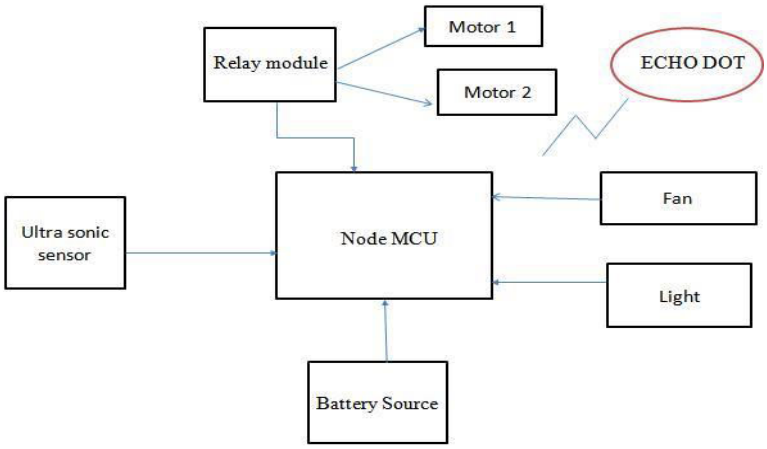

Fig 1. Block diagram of the proposed system

Relay modules usedbecause it consist of small amount of power which can control DC motors. Here 4 Channel Relay Module is used for controlling motors, light and fan. The Node MCU consist of 4 pins D0, D1, D2, D3. The Node MCU has
connection to the relay module. The relay module consists of 4 pins. Here one channel is used to move one motor and second is for next motor, other two channels are used for turn ON fan and light.The dc motors have high starting torque,so fast starting,stopping and reversing can be done and its speed can be controlled. An ulta sonic senser is used which it has high frequency, high sensitivity and high penetrating power so that it is easy to analyse the obstacles. A recharger battery source is used, which can be rechaged many time with a simple battery chrger. The interfacing of echo dot and Node MCU we can move the system according to our needs. The flow chart of the proposed system is given below

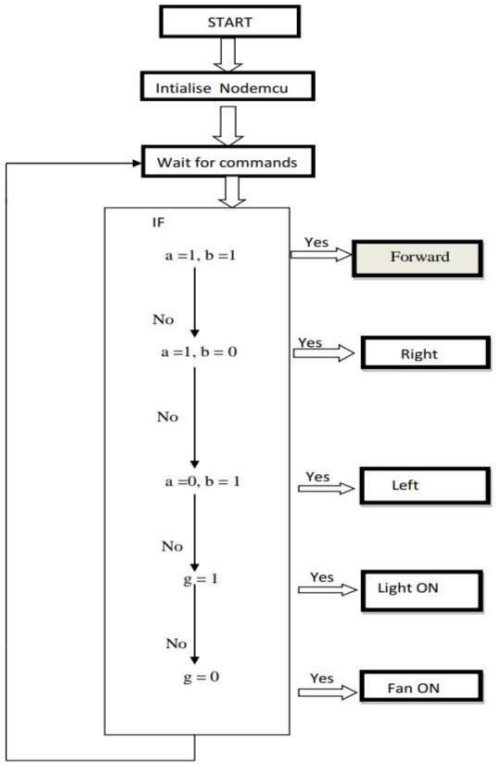

Fig 2. Flow chart of the proposed system

3.1 Cırcuıt Dıagram

The systems consist of mainly 4 relays. One relay for one motor and another relay for next motor. Third relay is for turn ON LED and fourth relay is for switch ON the fan. These are the four concepts. Echo dot is used for controlling these 4 relays. The activities are done inside the echo dot. There are objections inside echo and then we give the instructions move trigger FORWARD, two ports get ON. When instructions given to Echo is move trigger LEFT, one port get ON and another port get OFF. When move trigger RIGHT is given, the port which is ON at left get OFF and another port get ON. When move trigger STOP is given, two ports get OFF. Then for moving motor forward, D0 and D4 pin get taken.

When D0 and D4 is 1, 2 motor get works and 2 relay get ON and move the stroller FORWARD. When move trigger RIGHT is given, D0 gets OFF and D4 gets ON, then one motor is ON and other motor is off, motor moves to RIGHT.

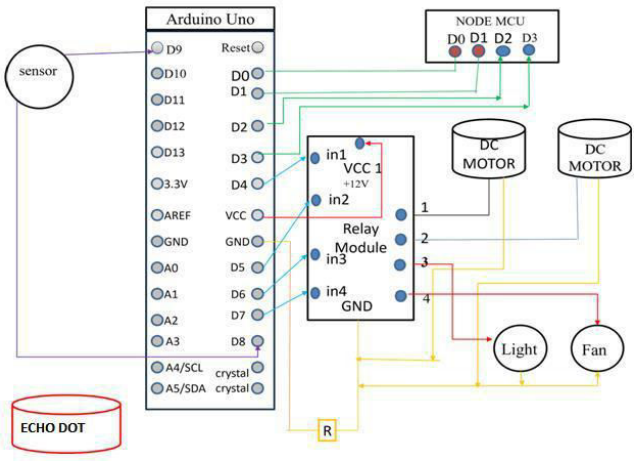

Fig 3. Circuit diagram of the proposed system

When move trigger LEFT is given, D0 gets ON (HIGH) and D4 gets OFF (LOW). Then other motor ON and one motor OFF, then move to LEFT .Then move trigger STOP is given, 2 motors gets OFF and port turns to LOW.

Then takes third relay that is LED ON condition. When D0 is given, D0 port gets ON, then give command LED ON and D0 port is OFF, give command LED OFF. Then we take fourth relay for fan, same function is applied. For Node MCU, WIFI is using to control the Echo function. WIFI means wireless connection. When any information is given to Echo, move trigger FORWARD is given, Echo capture these instruction and is given to the server. Server can be from anywhere of these world. Here a 24 V,1500 RPM, gear box DC motor is used which gives low speed and high torque. Information is passed on to the server just like the signal captured by the satellite and these information is again passed onto the Node MCU. These are the method of controlling.

3.2 System Implementatıon

Here a platform is made; a chair is weld on the top of it. Platform is made using 0.25 inch pipe roll. This pipe roll is taken and cut it into equal parts. Then a plate is welded on the top of the platform. At the two sides, two motors are kept. The long holes are made at the two sides for fixing these motors. A chain is given to the motors and is connected. Make sure that the chain is kept tight.

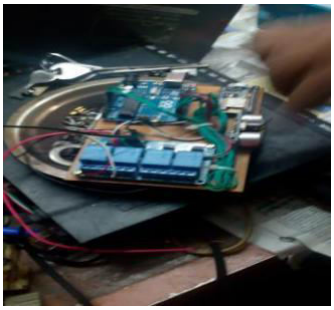

Fig 4. Circuit implementation

Fig 5. Eco dot Stroller for paralysed children

Fig 6. Eco dot Stroller for kids

The Node MCU, Relay is embedded on circuit board. The jump wire is used connect D0 of Node MCU and around of Node MCU. The glugum is used for the fixation of jump wire on the circuit board. Then this circuit board is placed on the plate for the functioning of the system.

4 Future Scope Of The Project

The system helps the kids more independent. The system also help to reduce the stress of the users by providing music, news etc. The stroller can easily move by giving command to Echo. Android app can control the system at any corners of the world. So the people can know the problem faced by the users. This is more comfort and provides robustness to the physically disabled children.

5 Results

The system was successfully implemented to move freely in Left, Right, Forward or stay in the same position. Due to the presence of echo dot, the users get more entertainment time. The strollers detect obstacles at the front and stop the movements. The system is controlled by Android App which control echo dot at any corners of the world. Here the echo dot is completely controlled by Node MCU. The devolved system helps to reduce the strain of users. The system is completely wireless system. Along with Android App 4 channel Relay is also include. The system is cost effective and more economical so it is efficient for physically disabled children and also for the kids. So the user can use it from anywhere at any time. With the help of circuit system on the plate below the chair, it can move easily with the help of Echo dot. The system is about 5Kg. So it can handle easily by the users. The stroller is easily made and implemented.

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