

AI BASED VEHICLE ASSISTANT FOR PARALYZED PERSON

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Abstract : Many people are suffering from temporary or permanent disabilities due to health issues or accidents. For cases of difficult, pain or impossible walking the use of a power wheelchair is becoming really important. Despite the fact that many debilitated people stay happy with manual or fueled wheelchairs, there is a fragment of handicapped individuals who think that its troublesome or difficult to utilize wheelchairs autonomously without any help. In such cases users often lack independent mobility. Researchers involved in medical industry are aiming at designing smart wheelchairs as viable solutions. Various wheelchairs have been created already. Many other wheelchairs have been created by using brain signals, vision dependence. This project is to plan a keen wheelchair utilizing voice acknowledgment and accelerometer for Gesture. The user can use it with comparatively less endeavors in an easy, independent and efficient manner.

Keywords : Google Assistant AI , ROBO-Wheelchair, Node MCU-controller, Accelerometer, Ultrasonic Sensor, GSM, Pulse sensor

I.INTRODUCTION

There is a reliably creating number of people who need to go around with the help of a couple or the other counterfeit strategies, paying little heed to whether through a disaster or malady. In order to improve the individual fulfillment for these people and energize their blend into the working scene, these strategies must be logically refined. There are structures recently passed on which respond to a critical number of the prerequisites of people with different degrees of crippling (Leifer, 1981; Borenstein&Korean, 1985; Madras, 1986; Jinet al., 1993). Regardless, this field still requires a huge amount of degrees of progress. At the given time different research programs which are being finished legitimize this; the TIM MAN adventure (Mill administrator and Allow, 1994; Concede, 1994), the Mentor adventure (Gelin et al., 1993) and the SKIL oversee system (Sabbe, 1993). While control wheelchairs can fulfill the necessities of various such people, a couple of individuals in the weakness organize find it adjacent to hard to use a standard wheelchair. This assignment could push forward for an unequivocal development. It empowers the individual to have an undeniably free, beneficial and enchanting living information. DC motors are used to move the wheelchair in an Android-based wheelchair controller system. Nowadays, controlling a wheelchair without any other person is an issue looked by weakened people. All over they need help of others to support them. An unrivaled way will be given by this endeavor to manage the improvement of wheelchair in controlling the four headings . The general wheelchair improvement includes a DC motor and motor driver module set up together with a microcontroller system . Android-based wheelchair controller application involves android contraption and an item application that can be rushed with standard wheelchairs to control the progression by utilizing a DC engine. WiFi correspondence tradition is used to pass on information between the android device and the wheelchair. Actually there are 4 essential choices for the developments of a wheelchair to be associated by the customer. The four options of the wheelchair can be depicted as the going with: a. Going backward b. Pushing ahead c. Swinging to the other side and right.

1.DESCRPTION

People have inadequacies with their hands, foot and lower farthest focuses by virtue of which they are powerless to perform normal undertakings. Numerous advancements are available to beat this issue. To crush this issue, there are a couple of uses in the market which help incapacitated people to play out their tasks. Proposed setup supports voice commencement system for physically disabled individuals solidifying manual undertaking. If an individual is weakened.

2. METHODOLOGY

Self-ruling adaptability decreases dependence on parental figures and relatives and advances assessments of freedom. Impeded flexibility every now and again results in decreased opportunities to socialize, which prompts social isolation, strain and debilitation. While the prerequisites of various individuals with insufficiencies can be content with standard manual or power wheelchair, a piece of the disabled system feels that its troublesome or hard to use wheelchairs uninhibitedly. This masses joins individuals with low vision.

3. CHALLENGES :

The proposed wheelchair would bring more settlement for the incapacitated people. The development can in like manner improve prosperity for customers who use customary joystick-controlled energized wheelchairs, by foreseeing crashes with dividers, fix furniture and different people.

PROPOSED METHOD

The structure of advanced or smart Wheelchair utilizing Voice and Motion Control framework includes two guideline parts to be explicit, Equipment and Programming. The gear circuit is utilized to see, digitize and transmit control banner to wheelchair motor driver and mpu6050 for Signal Acknowledgment. The gear involves distinctive parts which are portrayed underneath. Here a control unit named as Hub MCU microcontroller is used. If a paralyzed person becomes abnormal his heart rate will be detected through the pulse sensor and a message will be sent to his caretaker and doctor through GSM.

FLOW CHART

Flow Diagram

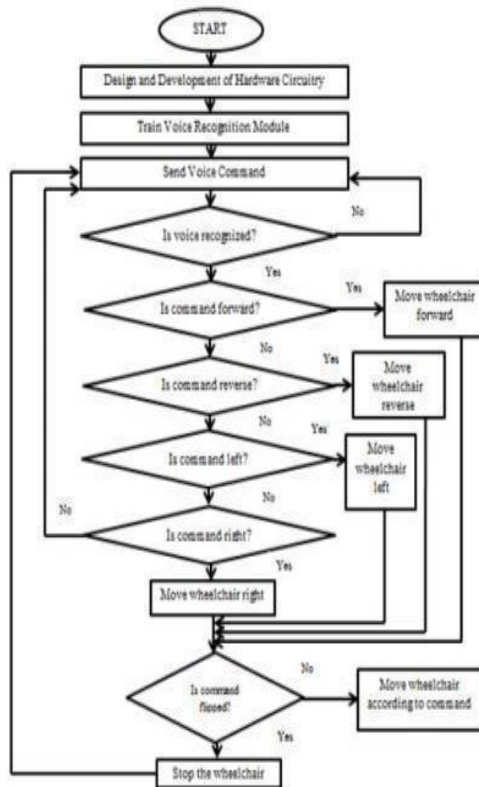


Figure.1

SYSTEM MODULE

The advanced framework is created around the following parts:

- Which makes a move upon information gathered called microcontroller.
- Voice Recognition module (Google)
- To avoid obstacles in path Ultrasonic sensors are used.
- L293D motor module to drive the motor Accelerometer Gesture for the general population who are not ready to talk and move their hands.

- GSM module for sending ready flag and heartbeat sensor to observe the pulse.

The advanced implanted module can be controlled through the voice direction and sensors are utilized for obstruction evasion reason. The simple voice order given by the client is gotten through a receiver which is worked inside the voice acknowledgment module(Google AI). When voice flag is gotten by the receiver in google AI voice distinguishing proof and acknowledgment is accomplished by the discourse acknowledgment module. When discourse module begins, ultrasonic sensor (HC SR-04) additionally gets introduced by the clock task in microcontroller. After sensor is instated, deterrent identification procedure will be begun and will often insinuate the controller about the separation of impediment.

Yield from voice acknowledgment module where voice direction is changed over in to advanced structure is headed to Microcontroller. The changed over advanced flag is given as contribution to mi, to take further activities. Deterrent shirking framework is finished by Ultrasonic sensor module, the detected information from ultrasonic sensor is additionally given as contribution to microcontroller. The wheels are controlled by means of engine driver(L293D). As per the information gathered from voice acknowledgment module (Google AI) and Ultrasonic sensor ,The moment of the embedded module planned. Accelerometer associated with the engine driver individuals who are not ready to talk and move their hands once the person give the signal development the vehicle will move he general engineering of the framework is as per the following.

ARCHITECTURE DIAGRAM

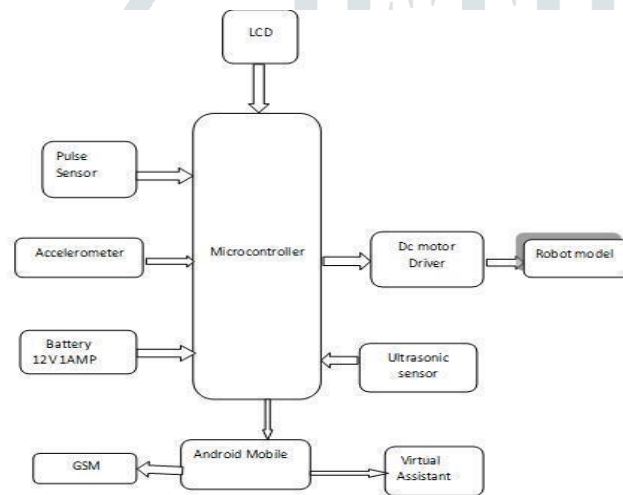


Figure. 2

OPERATION OF SYSTEM COMPONENT

1.Node MCU

Node MCU is an open source LUA based firmware created for ESP8266 wifi chip. By examining helpfulness with ESP8266 chip, Node MCU firmware goes with ESP8266 Development board for instance Node MCU Development board. Node MCU Dev Kit has Arduino like Analog (for instance A0) and Digital (D0-D8) sticks on its board. It supports consecutive correspondence traditions for instance UART, SPI, I2C, etc. Using such consecutive traditions we can connect it with successive devices like I2C enabled LCD appear, Magnetometer



Figure.3

2.VOICE RECOGNITION

A menial helper or keen individual partner is a product operator that can perform errands or administrations for an individual dependent on verbal directions. Here and there the expression "chatbot" is utilized to allude to menial helpers by and large or explicitly gotten to by online talk (or now and again online visit programs that are solely for excitement purposes). Some menial helpers can translate human discourse and react through combined voices. Clients can ask their partners questions and media playback by means of voice and oversee other essential assignments for example, email, daily agendas, and schedules with verbal directions.

3 .ULTRASONIC SENSOR

To keep up progressively secure partition from the obstruction, a set ultrasonic sensors are executed on the front side of the wheelchair. At whatever point sensor is begun by heartbeat from the controller, it will start creating eight 40Khz banner. The transmitting time of the sensor is called PING and it will sit tight for reflected banner from any obstacle in its way. This reflected banner is called ECHO. The evacuate is resolved using the verbalization.



Figure.4

The separation is determined utilizing the articulation

$$\text{distance} = (\text{duration}/2) * 0.03$$

where,

it will detect obstacle within 50 cm Distance.

4.MOTOR DRIVER(L293D)

The L293 and L293 devices are quadruple high current half-H drivers. The L293 is designed to provide bidirectional drive currents of up to 1 A at voltages from 4.5V to 36V. The L293d is designed to provide bidirectional drive currents of up to 600mA at voltages from 4.5V to 36V.Both devices are designed to drive inductive loads such as relays,solenoids, DC and bipolar stepping motors, as well as other high –voltage loads in positive supply applications.

5.LCD

LCD(Liquid Crystal Display) is a flat panel display that uses the light modulating properties of liquid crystals. They emit the light using a back light or reflector to produce images in color or monochrome. It displays the output according to the commands given.

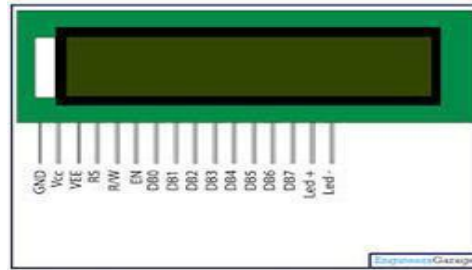


Figure.5

6.ACCELEROMETER

Accelerometer sensor is utilized to perceive the hand gestures. It recognizes the tilting of the turn in both X and Y axes. It produces diverse numerical values corresponding heading of quickening.



Figure.6

7. GSM AND PULSE SENSOR

Pulse sensor is use to monitor the person's heart beat each and every second once the person's pulse is abnormal automatically the Alert message is sent to the care taker and doctor.



Figure .7

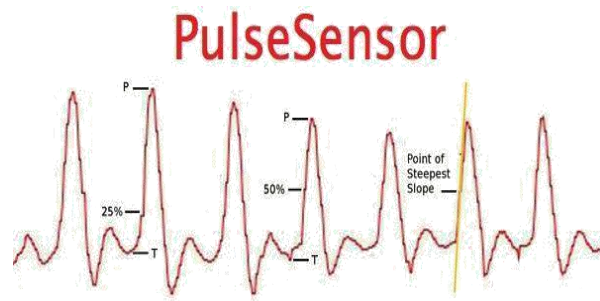


Figure.8

PROGRAMMING

Microcontroller are expected to play out a specific action Embedded C programming were presented in this work. Arduino programming is used to control the motor driver to give the movement of the vehicle and also is used to avoid the obstacles through the ultrasonic sensor. NLP language is used to recognize the voice command. NLP is utilized to perceive the human directions for giving the development of vehicle. Neural networks figuring is used to see the voice to give the advancement of vehicle

RESULT AND ANALYSIS

The advanced work is the plan of wheel seat fueled by Google Assistant. The precision of the given wheel chair is tried under three distinct conditions to be specific: grouping 1)Wheelchair movement using virtual assistant, ii) Wheelchair movement using gesture mode, iii)Wheelchair movement using button control. The framework is tried for its legitimate working. For example legitimate development of the wheel chair upto five preliminaries and the outcome is given. The outcome show 100% precision and further more utilizing three methods of control for example utilizing voice controller and further more utilization.

1. wheelchair movement using voice recognition

2 . wheelchair movement using accelerometer

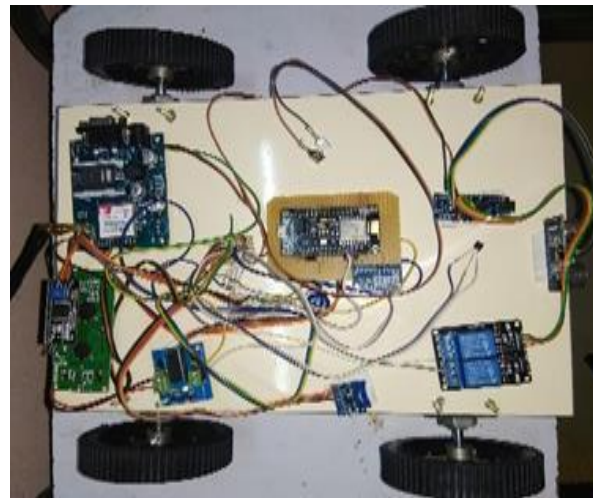
Voice Command						Total Response
	1	2	3	4	5	
Forward	one	one	one	one	one	five
Backward	one	one	one	one	one	five
Left	one	one	one	one	one	five
Right	one	one	one	one	one	five
Stop	one	one	one	one	one	five

Gesture Mode						Total Response
	1	2	3	4	5	
Forward	one	one	one	one	one	five
Backward	one	one	one	one	one	five
Left	one	one	one	one	one	five
Right	one	one	one	one	one	five
Stop	one	one	one	one	one	five

MODEL

3. wheelchair movement using button control

Button control						Total Response
	1	2	3	4	5	
Forward	one	one	one	one	one	five
Backward	one	one	one	one	one	five
Left	one	one	one	one	one	five
Right	one	one	one	one	one	five
Stop	one	one	one	one	one	five



CONCLUSION

This work explains the structure and development of wheelchair with the assistance of accelerometer module. The circuit works legitimately to move as the order given by the client. In the wake of planning the circuit that empowers physically incapacitated to control their wheel utilizing an Google Assistant in their cell phones and it has likewise been tried and approved. The recognition of any impediment is effectively constrained by the microcontroller. As the individual switches on the circuit and begins moving, any hindrance which is relied upon to exist in a scope of 4 meters will be distinguished by sensor. This proposed framework adds to the self-reliance of distinctively abled and more established individuals. In the event that the separation between android cell phone and wheel seat surpasses 10 meters, the controller can't be come to since the wifi isn't in the scope of module to perform network to the seat .

FUTURE SCOPE

This paper is to plan and develop a splendid wheelchair using voice and virtual commands and gesture control is done. The made wheelchair is anything but difficult to utilize and does not contain any PC structure with wheelchair for controlling. So it is direct and process. It contains two modules to control the advancement of the wheelchair as demonstrated by customer headings. In case any patient can't move their hands, by then voice bearings can be used for the course of the wheelchair openly. A phone mounted on the wheelchair can be used to give voice headings. This system gives free versatility similarly as various sharp workplaces to the rising debilitated people.

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