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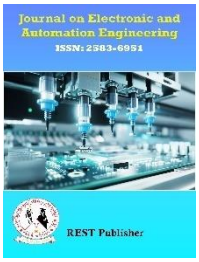

Electric Wheel Chair Controlled Through Voice Command Using Arduino and Bluetooth Module

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Abstract. The main objective of this project is to help the movement of disable people or handicapped and also the elder people who are not able to move well. The result of this design will allow the special people to live a life with less dependence on othersThe proposed system describes the design of a smart, motorized and voice-controlled wheelchair using an embedded system. The system design depicts the "Smart Wheelchair" that supports voice activation system for physically disabled and old aged people by incorporating voice commands which would control the movement of the wheelchair. The voice command is given through a cellular device such as cell phone having Bluetooth and the command is transferred and converted to the string for Arduino and is transferred to the Bluetooth Module HC-05 connected to the Arduino board for the control of the Wheelchair. When the user says "Go" the chair will move in the forward direction, the chair would move in the backward direction for "Back" and similarly "Left", "Right" for rotating it in left and right directions respectively and "Stop" to stop the wheelchair. This system is designed and developed to save cost, time, energy and dependence on the others for the movements of wheelchair-using physically handicapped person.

1. INTRODUCTION

The Electric Wheelchair extends the capability of traditional powered machines by introducing control and navigational intelligence. These machines can ease the lives of many disabled people, particularly those with severe impairments by increasing their range of mobility. For the differently disabled people, there are inventions of wheelchairs, which can be moved using hands. Some people move the wheelchairs using their own hands. Some have to reply on others. But sometimes such people face many problems if they don't get any person to move their wheel chair or they may get tired. This project "Smart Wheelchair using Adriano and Bluetooth module" aims to resolve the mentioned issue. In this project we are going to make a wheel chair which can be controlled automatically using the voice commands. The system allows physically disabled person to control the wheelchair easily without the need to use the hands. The movement of the powered wheelchair depends on the motor control and drive system which consists of microcontroller and motor driving. The main objective is to design a system which provides solutions for the physically handicapped people those who can't move by themselves. The application of this project "Voice Controlled Wheelchair" is to control the wheelchair through voice commands, sensors. As this is a multi-functional Wheelchair so therefore it can also be called as the smart wheelchair. The user voice recognition module, ultrasonic sensor, have been integrated in this wheelchair. In this way we have obtained a wheelchair which can be driven with voice commands, through sensors so that to provide the possibility of avoiding the accidents. This project involves android mobile which will recognize the voice of the user and process the command of the user and send it to the Arduino. The user has to save the different voice commands in voice android mobile before use it to control the direction of the wheelchair. Arduino is a microcontroller-based board which accepts data. The Arduino board based on the Atmega328 microcontroller processes the data and determines which motor will be activated. User can also change the direction of the wheel chair, while the sensors will automatically avoid the obstacles. The movement of the wheelchair is controlled by the motors and motor driver connected to the wheelchair

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FIGURE 1. Electric wheel chair

2. LITERATURE SURVEY

This University of Pittsburgh, Forbes Tower, Pittsburgh We are therefore developing a modular Smart Wheelchair Component System (SWCS), shown in Figure 2, which can be added to a variety of commercial power wheelchairs with minimal modification. We envision a collection of components that can be attached to standard power wheelchairs from several different manufacturers to convert them into smart wheelchairs. The SWCS is being designed to accommodate all traditional input methods (analog joystick, touch-activated switches, pneumatic "Sip n' Puff" switches, etc.) and to be compatible with multiple brands of wheelchairs. Humberto Sermeno-Villalta, Lehigh University A vision-based control approach for autonomously docking a wheelchair onto a vehicle lift platform. This is a principal component of the automated transport and retrieval system (ATRS) - an alternate mobility solution for drivers with lower body disabilities. The ATRS employs robotics, automation, and machine vision technologies, and can be integrated into a standard minivan or sport utility vehicle (SUV). At the core of the ATRS is a "smart" wheelchair system that autonomously navigates between the driver's position and a powered lift at the rear of the vehicle eliminating the need for an attendant. From an automation perspective, autonomously docking the wheelchair onto the lift platform presented the most significant technical challenge for the proof-of-concept ATRS. This was driven primarily by geometry constraints, which limited clearance between the chair wheels and the lift platform rails.

3. PROPOSED SYSTEM

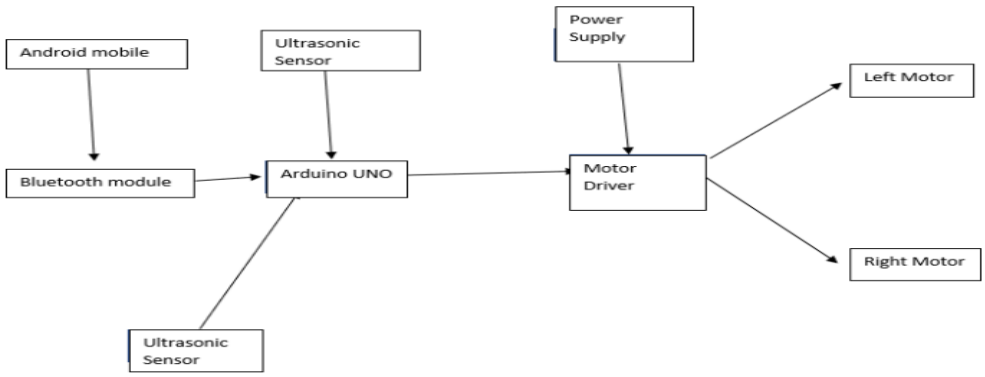

FIGURE 2. Block diagram of electric wheel chair

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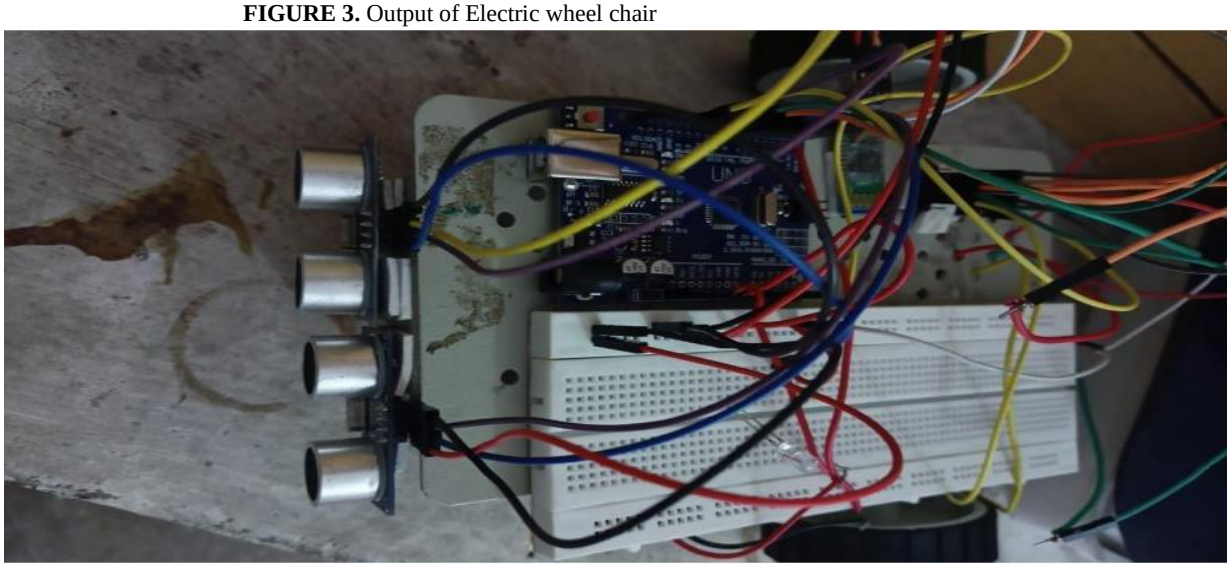
First download the app from the Google Play Store edit a new panel for your Wheelchair controls now click on the "Connect" button and select "Bluetooth Classic" option then click "Next" button to build up the Bluetooth connections select connection method after pairing between the application and "HC-05 Bluetooth Module" and click "Done" button. Finally Click "Run" button to start working with this app. Required code for this project is dumped into the Arduino uno give commands to the Arduino uno with the help android mobile(by pairing Bluetooth with Bluetooth module hc-05) Arduino uno pass the signals to the motor driver the motor driver increases the required voltage to drive the motor movement. As motor requires more voltage for the movement based on this commands the wheelchair will be moved ultrasonic sensor sense the obstacles and give those signals to the Arduino.If there is no obstacle , the Arduino sends the signals for wheel movement if the ultrasonic sensor sense the obstacle, the information pass to the Arduino, then the Arduino does not give signals to the motor driver which results no movement in the wheel.The buzzer makes sound if ultrasonic sensor sense the obstacles

4. RESULT

FIGURE 3. Output of Electric wheel chair

5.



CONCLUSION

The The design and implementation of a voice-controlled wheelchair for disable people using Arduino and Bluetooth module for controlling the motion of a wheelchair is designed. The direction of the wheelchair now can be selected using the specified voice commands. The design not only reduce the manufacture cost compared with present market but also will give great competitive with other types of electric wheelchair. The only thing needed to ride the wheelchair is the synthetic voice commands of the. The wheelchair can also include the gesture feature to operate the wheelchair.

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