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Design & Fabrication of Voice Controlled Braking System Apparatus

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Abstract: *This project was developed in a way that the robot is controlled by voice commands. An android application with a microcontroller is used for required tasks. The connection between the android app and the vehicle is facilitated with Bluetooth technology. The robot is controlled by buttons on the application or by spoken commands of the user. The movement of the robot is facilitated by the two dc servo motors connected with microcontroller at the receiver side. The commands from the application is converted in to digital signals by the Bluetooth RF transmitter for an appropriate range (about 100 meters) to the robot. At the receiver end the data gets decoded by the receiver and is fed to the microcontroller which drives the DC motors for the necessary work. The aim of Voice Controlled Robotic Vehicle is to perform the required task by listening to the commands of the user. A prior preparatory session is needed for the smooth operation the robot by the user. For the same a code is used for giving instruction to the controller.*

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I. Introduction

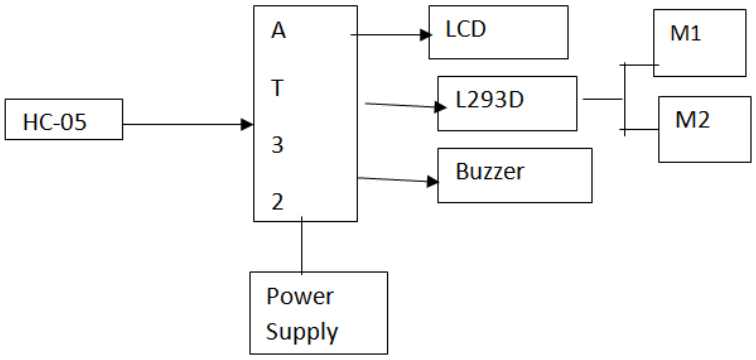
A we have provided vibration sensor to monitor the vibration caused by accidents and this information is transmitted through GSM module. [6] Automatic collision notification system use sensors embedded in a car to determine when an accident has occurred. These systems immediately dispatch emergency message. Thus it will send SMS through GSM. This system is used to intimate accident information to the owner of the vehicle. At any instant of time our voice will not be accurate due to some physiological reasons and it cannot be cleared in micro second. So we include anti-braking system and ultrasonic sensor plays a vital role in our system. Initially we calibrate vibration sensor and ultrasonic sensor. This project represents the principle of an advanced automatic voice recognition system with sensor fusion. It uses the properties of both capacitive and ultrasonic sensors for detecting the obstacles and also for calculating the distance between the vehicle and the obstacle. So the resulting system can achieve measurements with high accuracy and improved short distance measurement and it is used to control automatic braking system for safety applications. In this project a voice controlled wireless smart car have been presented for elder and physically challenged people. The proposed system has two main components namely (a) voice recognition system, (b) accident detection, (c) anti- braking system. Android Meet Robots software has been used to implement the voice recognition system. On the other hand, Bluetooth modules

have been used to implement the wireless system. The main goal of this system is to control Car motor direction by using voice commands. Unexpected hurdles on road may cause more accidents and due to bad road conditions, fuel consumption of the vehicle increases, causing wastage of precious fuel. All these reasons urge that it is important to get information of such bad road conditions, collect this information and distribute it to a Government body

II. LITERATURE SURVEY

Robotic Interface (HRI) is used by or with humans and is a field of research dedicated to understanding, evaluating and designing robotic system. There are different forms of human-robot communication and these forms are greatly influenced by the closeness of humans and robots. The robot car prototype is designed using Human Robot Interaction (HRI), which is controlled by user-specific commands provided by the robot user. The designed prototype uses voice recognition using Android phones. Convert them to a collection of digitally stored words. Human voice commands are performed by a robot with its own built-in microphone. The Bluetooth transceiver module also take decrees and ahead them to the robot's Arduino, as it controls his gesture according to the orders he receives. Pause the robots "go forward", "go back", "go left", "go right" and "stop" and stop back and forth and left and right according to the voice command. This prototype is designed to overcome the problems of manual wheelchairs and provide a quality life individually for the physically handicapped.

BLOCK DIAGRAM



DESCRIPTION OF BLOCK DIAGRAM

In Fig 2.1 A) block diagram of a transmitter, there we use HARDWARE REQUIREMENT

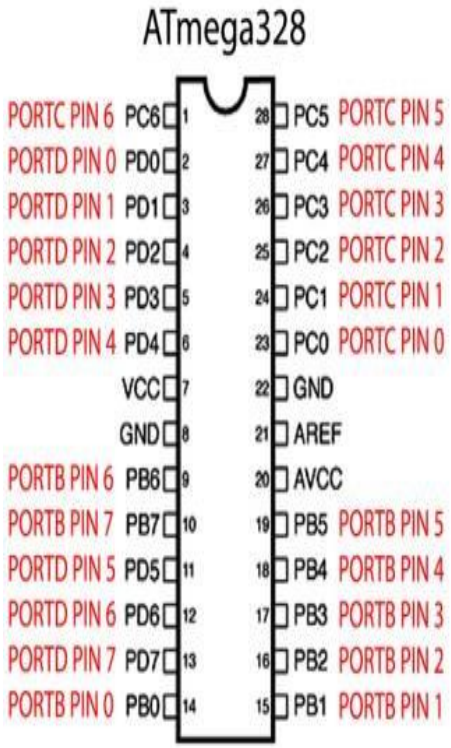
1. AT328 Microcontroller
2. LCD Display
3. Power Supply
4. HC-05
5. Buzzer
6. L293D
7. DC Motor

SOFTWARE REQUIREMENT

1. PROGRAMMING LANGUAGES
   Embedded C
2. COMPILERS:
   Keil 4.0uv
3. DUMPING SOFTWARE:

Using Micro controller flash magic/ preload Software we are dumping our HEX Code into Micro Controller

SYSTEM DEVELOPMENT
PIN CONFIGURATIONS:



Pin Descriptions
VCC
Digital supply voltage
4. GND
Ground

Port B (PB7:0) XTAL1/XTAL2/TOSC1/TOSC2

Port B is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port B output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port B pins that are externally pulled low will source current if the pull-up resistors are activated. The Port B pins are tristated when a reset condition becomes active, even if the clock is not running. Depending on the clock selection fuse settings, PB6 can be used as input to the inverting Oscillator amplifier and input to the internal clock operating circuit.

Depending on the clock selection fuse settings, PB7 can be used as output from the inverting Oscillator amplifier. If the Internal Calibrated RC Oscillator is used as chip clock source, PB7...6 is used as TOSC2...1 input for the Asynchronous Timer/Counter2 if the AS2 bit in ASSR is set.

The various special features of Port B are elaborated in ”Alternate Functions of Port B” on page 82 and ”System Clock and Clock Options” on page 27.

Port C (PC5:0)

Port C is a 7-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The PC5...0 output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port C pins that are externally pulled low will source current if the pull-up resistors are activated. The Port C pins are tristated when a reset condition becomes active, even if the clock is not running.

PC6/RESET

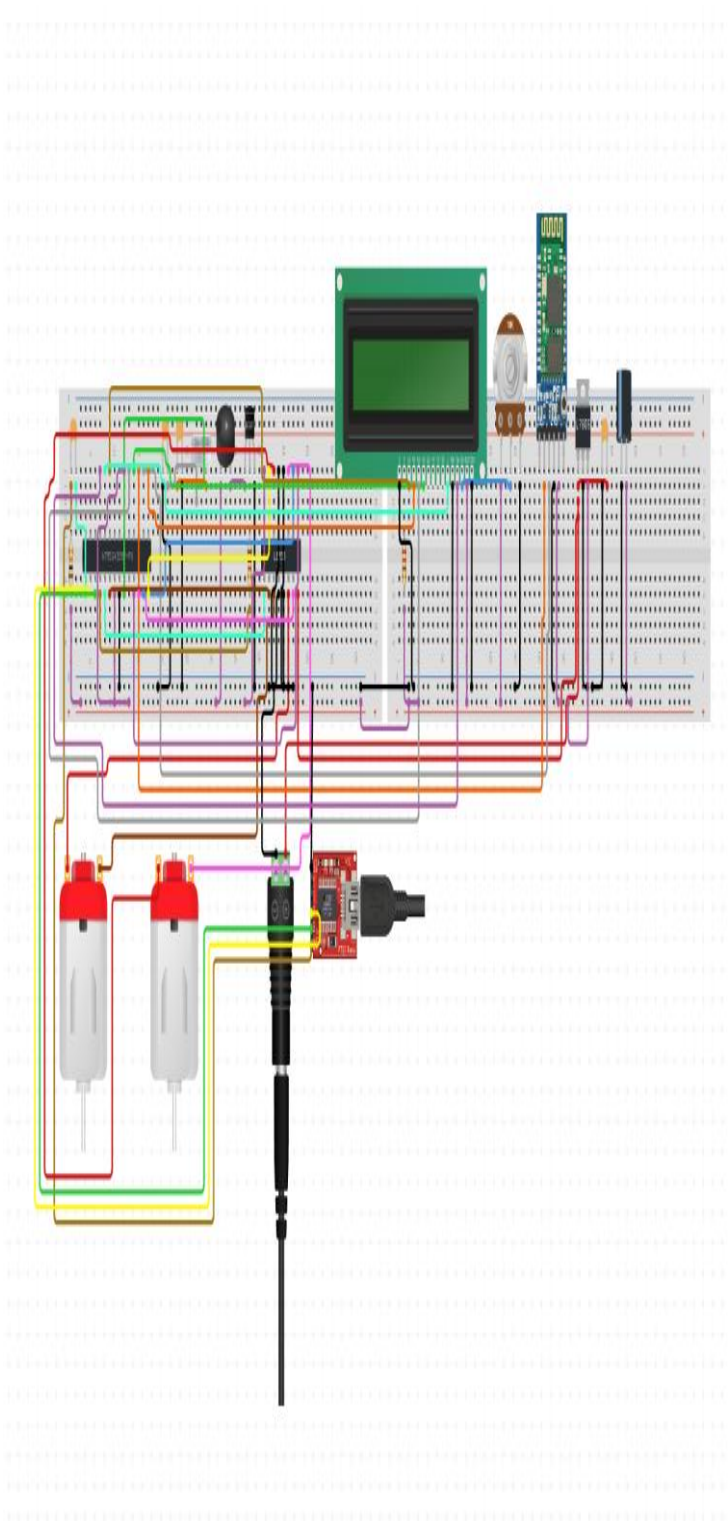
If the RSTDISBL Fuse is programmed, PC6 is used as an I/O pin. Note that the electrical characteristics of PC6 differ from those of the other pins of Port C. If the RSTDISBL Fuse is un programmed, PC6 is used as a Reset input. A low level on this pin for longer than the minimum pulse length will generate a Reset, even if the clock is not running. The minimum pulse length is given in Table 29-11 on page 305. Shorter pulses are not guaranteed to generate a Reset. The various special features of Port C are elaborated in ”Alternate Functions of Port C” on page 85.

Port D (PD7:0)
Port D is an 8-bit bi-directional I/O port with internal pull-up resistors (selected for each bit). The Port D output buffers have symmetrical drive characteristics with both high sink and source capability. As inputs, Port D pins that are externally pulled low will source current if the pull-up resistors are activated. The Port D pins are tristated when a reset condition becomes active, even if the clock is not running. The various special features of Port D are elaborated in ”Alternate Functions of Port D” on page 88.

AVCC
AVCC is the supply voltage pin for the A/D Converter, PC3:0, and ADC7:6. It should be externally connected to VCC, even if the ADC is not used. If the ADC is used, it should be connected to VCC through a low-pass filter. Note that PC6...4 use digital supply voltage, VCC.
AREF
AREF is the analog reference pin for the A/D Converter. 1.1.9 ADC7:6 (TQFP and QFN/MLF Package Only) In the TQFP and QFN/MLF package, ADC7:6 serve as analog inputs to the A/D converter. These pins are powered from the analog supply and serve as 10-bit ADC channels.

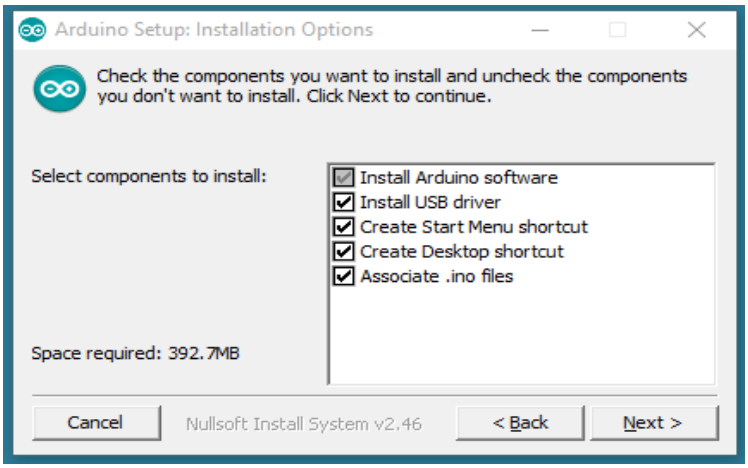
1. Get an Arduino or Genuino board and USB cable
In this tutorial, we assume you're using an Arduino or Genuino Uno or an Arduino or Genuino Mega 2560. If you are using a retired board as ArduinoDuemilanove, Nano or Diecimila please refer to the driver installation instructions end of this document. If you have another board, read the corresponding page linked in the main getting started page.

Circuit Diagram



1. Download and install the Arduino Software (IDE)

Get the latest version from the download page. You can choose between the Installer (.exe) and the Zip packages. We suggest you use the first one that installs directly everything you need to use the Arduino Software (IDE), including the drivers. With the Zip package you need to install the drivers manually. When the download finishes, proceed with the installation and please the driver installation process.



Choose the components to install

A. LCD (LIQUID CRYSTAL DISPLAY)

APPLICATION

• The robot is useful in places where humans find difficult to reach but human voice reaches. E.g., in fire situations, in highly toxic areas.
• It is the one of the important stages of Humanoid robots.
• Command and control of appliances and equipment
• Telephone assistance systems
• The robot can be used for surveillance or reconnaissance.

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III. Conclusion

This project represents voice control driving scheme to implement Automatic Braking system and vibration detecting system based on sensor fusion indented to use in vehicles that can solve the problem where drivers may not brake manually. So, vehicles can reduce speed automatically, if obstacle interfere in-front of ultrasonic sensors. This system provides high accuracy with accurate measurements. This system is very suitable in case of tight parking and heavy traffic conditions. We have implemented voice controlled Arduino based car automation system. We used speech recognition system to implement this work.

FUTURE SCOPE:

Further enhancement in this proposed model can makethis much better and advanced. In future, the plan is toinstall a sound assistance for the driver of the vehicle. Itwill be done by using interface between SD card and theArduino

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