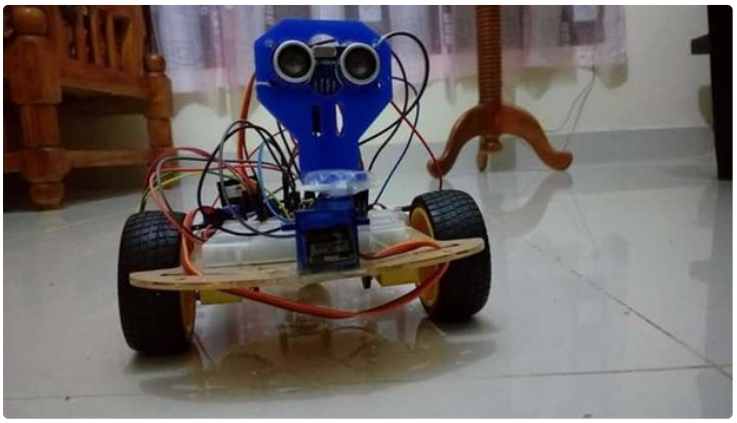
Obstacle Avoiding Robot (Arduino)

by Nayantha KGD

Here i'm going to instruct you about making an Obstacle Avoiding Robot based on Arduino. I hope to do step by step guide on making this robot in very easy way. An obstacle avoiding robot is a fully autonomous robot which can be able to avoid any obstacle which it face when it move. Simply, when it met an obstacle while it moving forward, automatically stop moving forward and makes a step back. Then it looks it's two sides left & right and starts to move the best possible way; which means either in left direction if there is another obstacle in right or in right direction if there is another obstacle in left side. The obstacle avoiding robot is very helpful and it is the base of many large projects such as Automatic cars, robots used in Manufacturing factories, even in robots used in spacecrafts.



Step 1: What You Need in This Project:

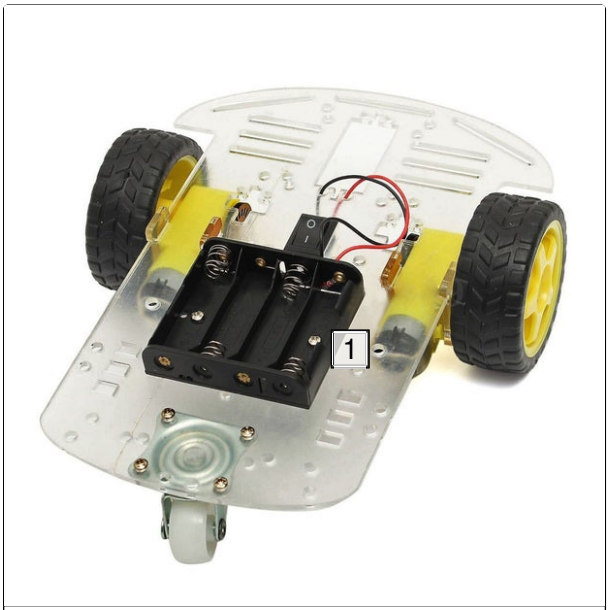
1. Arduino UNO - https://www.ebay.com/p/Arduino-UNO-R3-Board-With-...
2. Smart robot car chassis with 2 x toy car wheels and 1 x Universal wheel (or ball casters) - https://www.ebay.com/itm/Motor-New-Smart-Robot-Ca...
3. Two DC motors - https://www.ebay.com/itm/Arduino-Smart-Car-Robot-...
4. L298n motor driver - https://www.ebay.com/itm/New-L298N-DC-Stepper-Moto...
5. HC-SR04 Ultrasonic Sonar sensor - https://www.ebay.com/itm/Ultrasonic-HC-SR04-HC-SR0...
6. TowerPro micro servo 9g - https://www.ebay.com/itm/6X-TowerPro-SG90-Mini-Gea...
7. 7.4V 1300mah Lipo battery - https://www.ebay.com/itm/VOK-Lipo-Battery-for-RC-H...
8. Jumper wires (male-to-male, male-to-female)
9. Mini breadboard
10. Ultrasonic sonar sensor mounting bracket
11. Screws and nuts
12. Screwdriver
13. Soldering iron
14. Double sided tape(optional)
15. Hot glue gun(optional)

1. Arduino UNO

1. L298n

1. Ultrasonic sensor

1. TowerPro Micro servo 9g

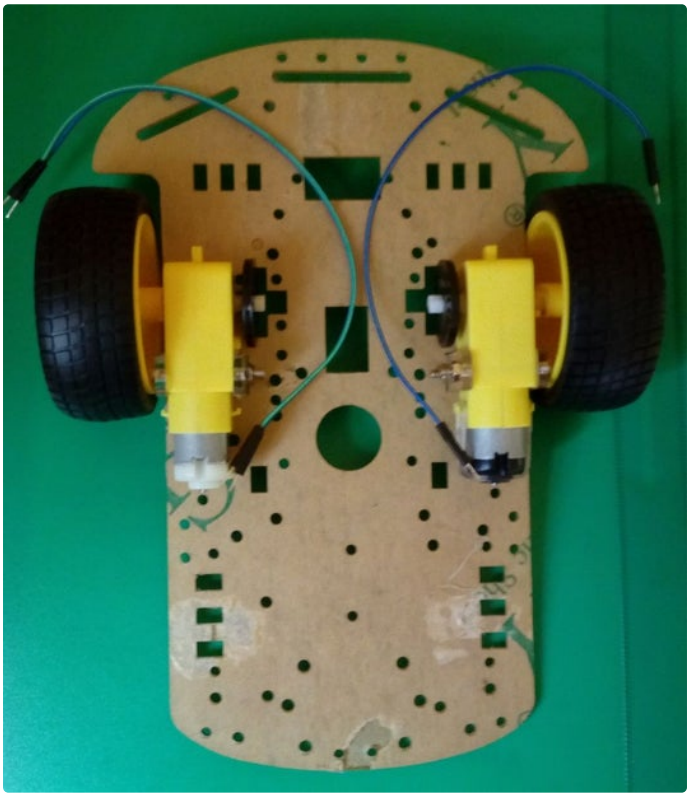


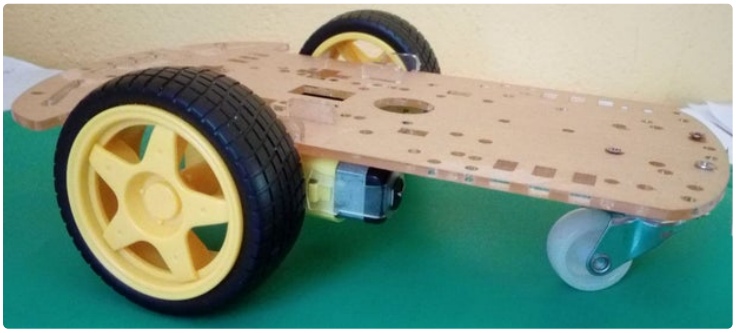
1. Chassis

1. Jumper wires

Step 2: Assembling the Chassis

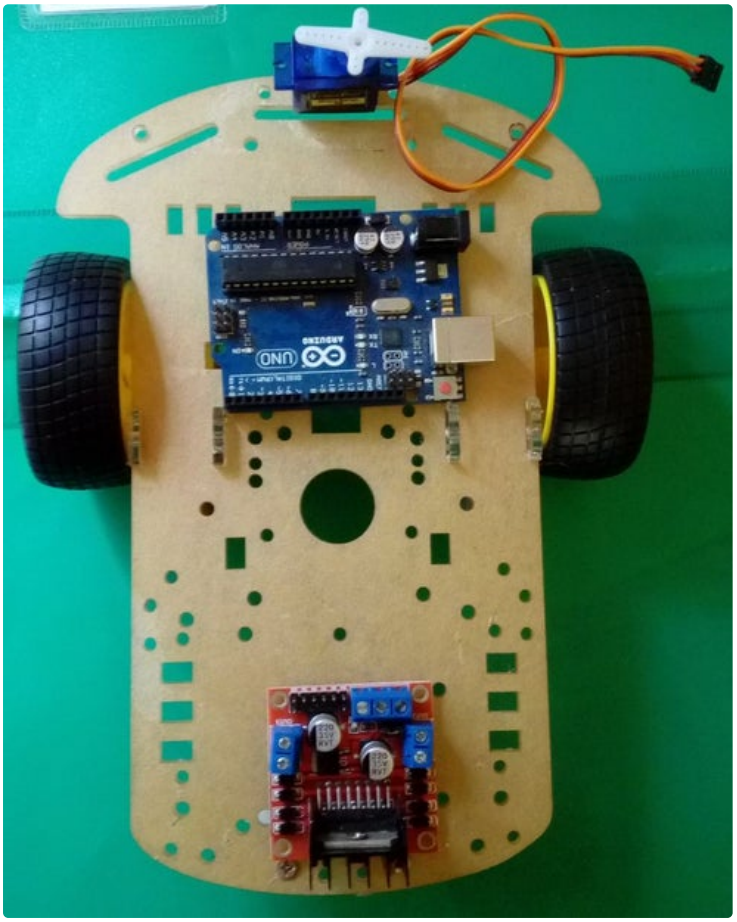
Solder two wires to each DC motor. Then fix two motors to the chassis using the screws. If you need any clarification, please watch this *youtube* video rel="nofollow">https://www.google.lk/url?sa=t&rct=j&q=&esrc=s&sou... and it will show you how to assemble the *Smart 2WD Robot car chassis*. Finally attach the Universal wheel (or ball caster wheel)





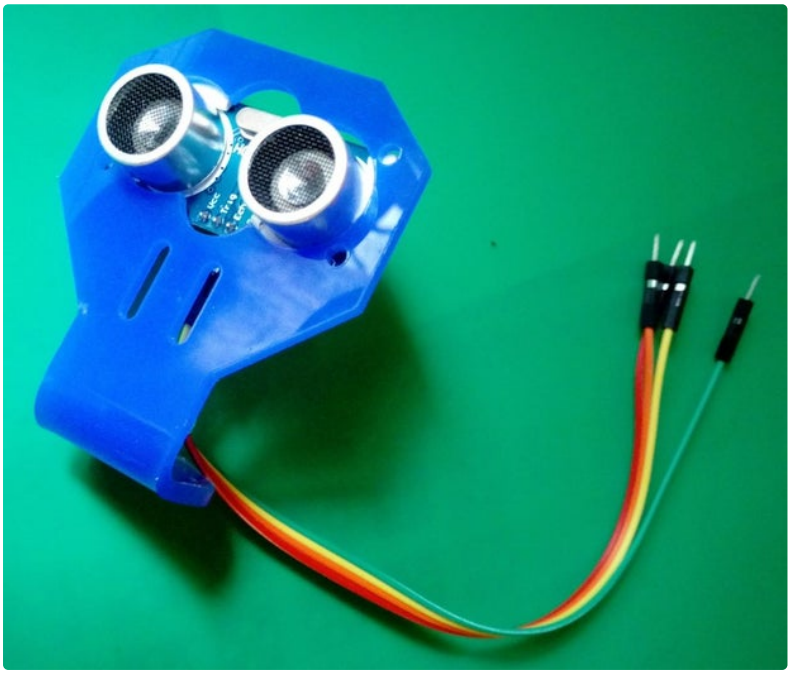
Step 3: Mount the Components

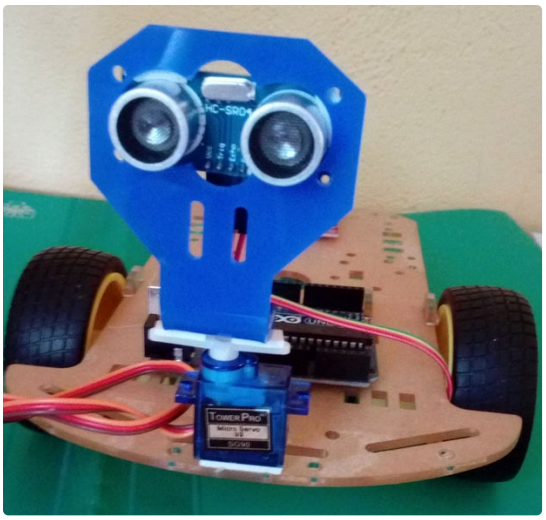
Mount the Arduino UNO, L298n motor driver and TowerPro servo motor on the chassis. *Note:* when mounting the arduino board, leave enough space to plug the USB cable, since later you have to program the arduino board by connecting the it to the PC via a USB cable.

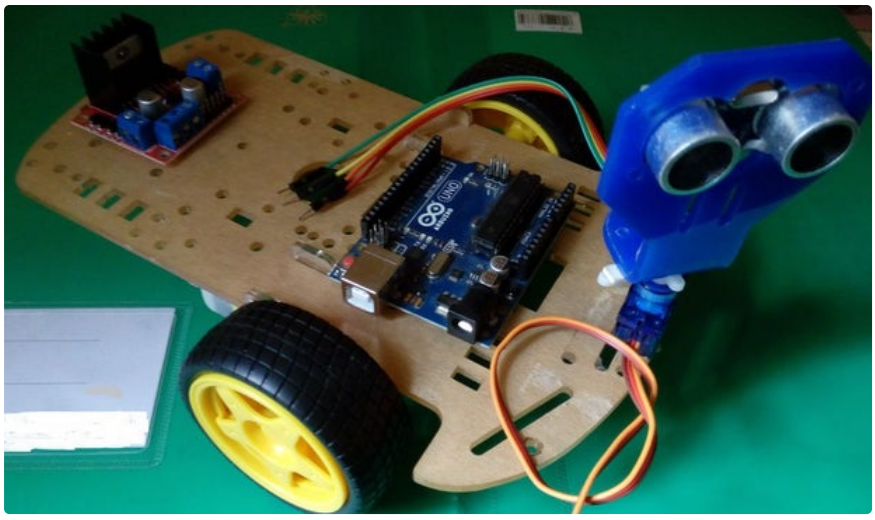


Step 4: Preparing the Ultrasonic Sensor

Plug four jumper wires to the Ultrasonic sensor and mount it on the mounting bracket. Then mount the bracket on the TowerPro micro servo which has already installed on the chassis.







Step 5: Wiring Components

L298n motor driver:

+12V → Lipo battery (+)

GND → Lipo battery (-) ***important:*** *connect the GND to lipo battery (-) and to arduino board any GND pin*

+5V → arduino *Vin*

In1 → arduino digital pin 7

In2 → arduino digital pin 6

In3 → arduino digital pin 5

In4 → arduino digital pin 4

Trig → arduino analog pin 1

Echo → arduino analog pin 2

GND → breadboard GND

TowerPro micro servo 9g:

orange wire → arduino digital pin 10

OUT1 → Motor 1

OUT2 → Motor 1

OUT3 → Motor 2

OUT4 → Motor 2

Breadboard:

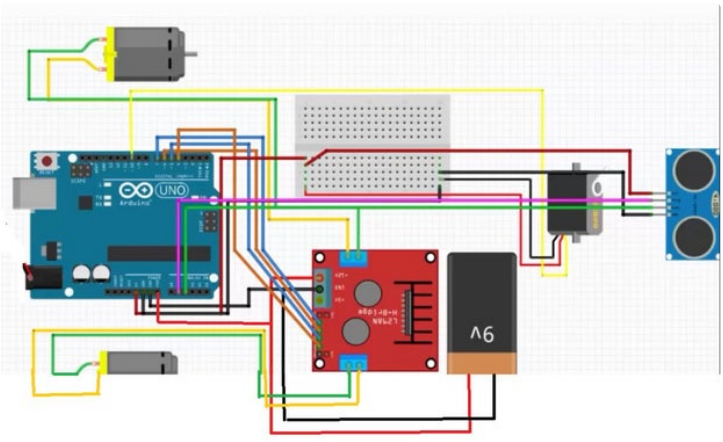
Connect two jumper wires to arduino board 5V and GND pins, then connect both wires to breadboard. now you can use this as +5V supply.

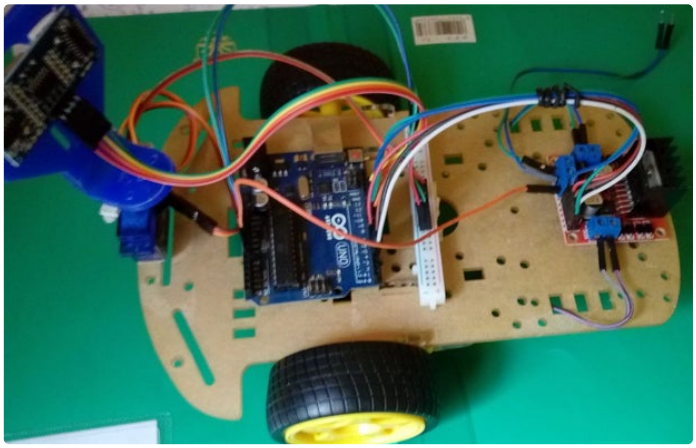
HC-SR04 Ultrasonic Sonar sensor:

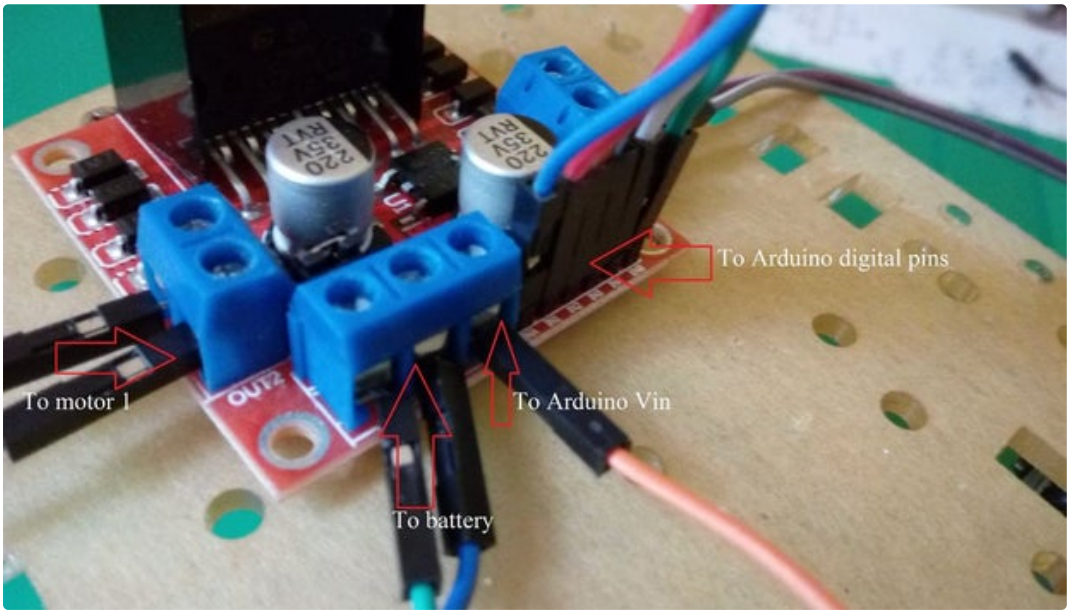
VCC → breadboard +5V

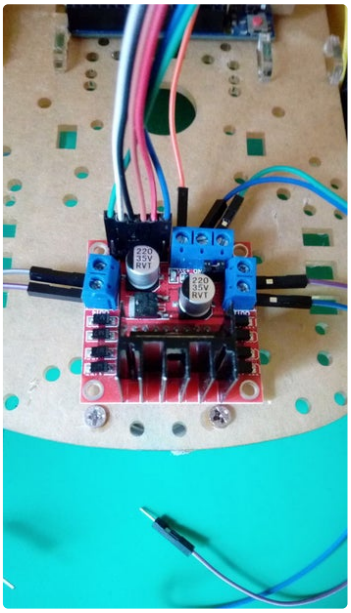
red wire → breadboard +5V

brown wire → breadboard GND









Step 6: Programming Arduino UNO

1. Download and Install the Arduino Desktop IDE
    - windows - https://www.arduino.cc/en/Guide/Windows
    - Mac OS X - https://www.arduino.cc/en/Guide/MacOSX
    - Linux - https://www.arduino.cc/en/Guide/Linux

2. Download and paste NewPing library (Ultrasonic sensor function library) file to the Arduino libraries folder.
    - Download the NewPing.rar below
    - Extract it to the path - C:\Arduino\libraries

3. Download and open *obstacle_avoiding.ino*
4. Upload the code to the arduino board via a USB cable

https://www.instructabl... Download

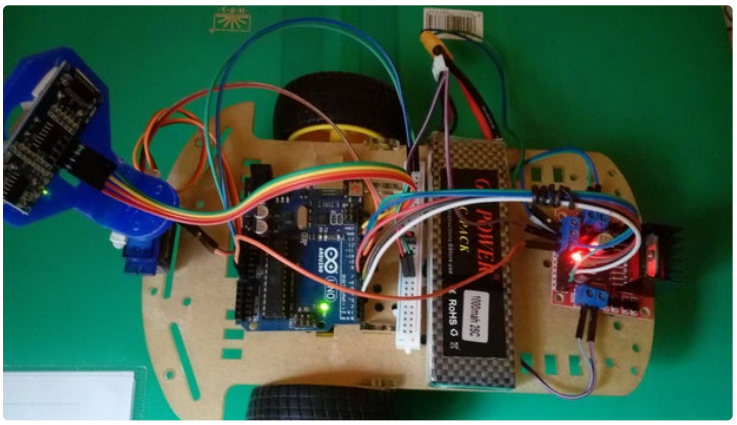
https://www.instructabl... Download

Step 7: Power the Robot

Connect the Lipo battery to the L298n motor driver as follows:

Lipo battery (+) → +12V

Lipo battery (-) → GND



Step 8: Great !!!

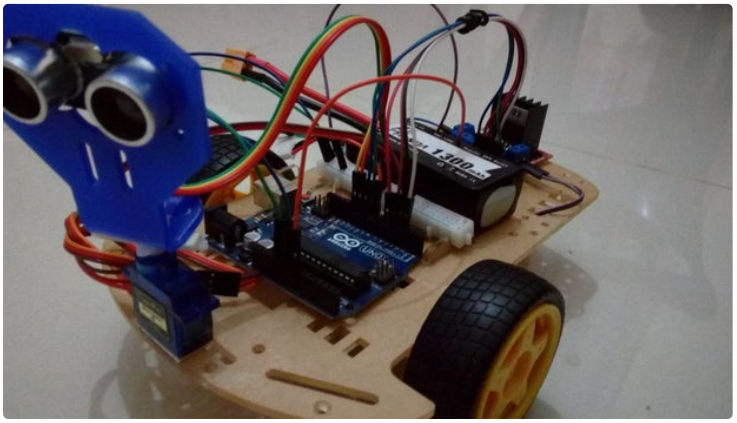
Now your robot is ready to avoid any obstacle....

I would be happy to answer any questions you have

email me: dnayantha88@gmail.com

search me on facebook and linkedin for more projects - *Danusha nayantha*

Thank You



sivaramalingam705@gmail.com is my Gmail account this didn't uploading in urduino please help me

Yes Sure!

hi. i'm new to arduino
i've already followed all the steps up there.
but when i tried to compile to coding. it say

Arduino: 1.8.10 (Windows 8.1), Board: "Arduino/Genuino Uno"

obstacle_avoiding:4:10: error: NewPing.h: No such file or directory
Multiple libraries were found for "Servo.h"
#include <NewPing.h> //Ultrasonic sensor function library. You must install this library
Used: C:\Program
^~~~~~~~~~
compilation terminated.
exit status 1
NewPing.h: No such file or directory
This report would have more information with
"Show verbose output during compilation"
option enabled in File -> Preferences.

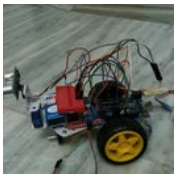
can you help me?
i've already download the NewPingLibrary and pu it in folder
C:/ProgramFiles/Arduino?libraries

thanks

Hi do you know how can we solve the problems

My model is dont work properly

My Obstacle avoider....



The programing says rigftmotorforward was not declared this scope

Did you make any changes to the code?

I cant complete my project

Hello guys, Please vote me on Arduino contest !!

Thank you

You should have to help me

maybe this is too much but i would like an detailed explanation of how it works.like if the motor driver only moves de dc motors forwards and backwards how does the car go left or right before moving forward or backwards

How do I control the speed of the dc motors? It's going too fast.

How do I do that? Can you please give me the connections I need to change and the part of the code I need to edit?

In order to control motor speeds, u need to use technique called "PWM" in arduino. Then you will have to modify this code and also some connections to motor driver as well.

i wanted to do this project ,is it possible for me to do this by following all your instructions ???

I recommend this!

Good instructions.

Can you tell me how to fix the step motor on the base? Thanks.

This smart car robot chassis isn't compatible with the stepper motors. But you can attach it to the base using a stepper motor bracket and making a hole using a drill.

Dude, it's AWESOME! For a novice like me, this is very helpful. Thanks a million!

I change some of your codes, for example instead of assigning digitalWrite on the motor, I use analogWrite to control the speed because it was too fast. Anyway, terrific job!

Thank you

good article !!

Thank you!!!

Great Arduino project. You should enter this into the Arduino contest that is currently running.

Thank you bro...

I entered to the Arduino contest and you can vote me now!!!

its very good learning basic robot as arduino.i like it.

Thank You!!! Please vote my instructable on Arduino contest