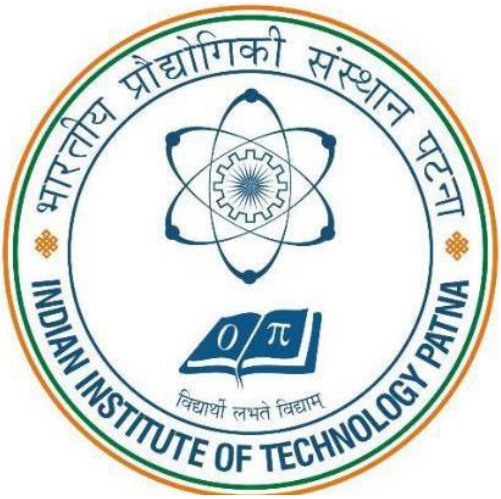
Indian Institute of Technology Patna



EMBEDDED SYSTEM PROJECT

Topic:
AURDIUNO BASED VOICE CONTROL CAR

Submitted by
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2011MT07

In The Guidance Of:
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Description :-

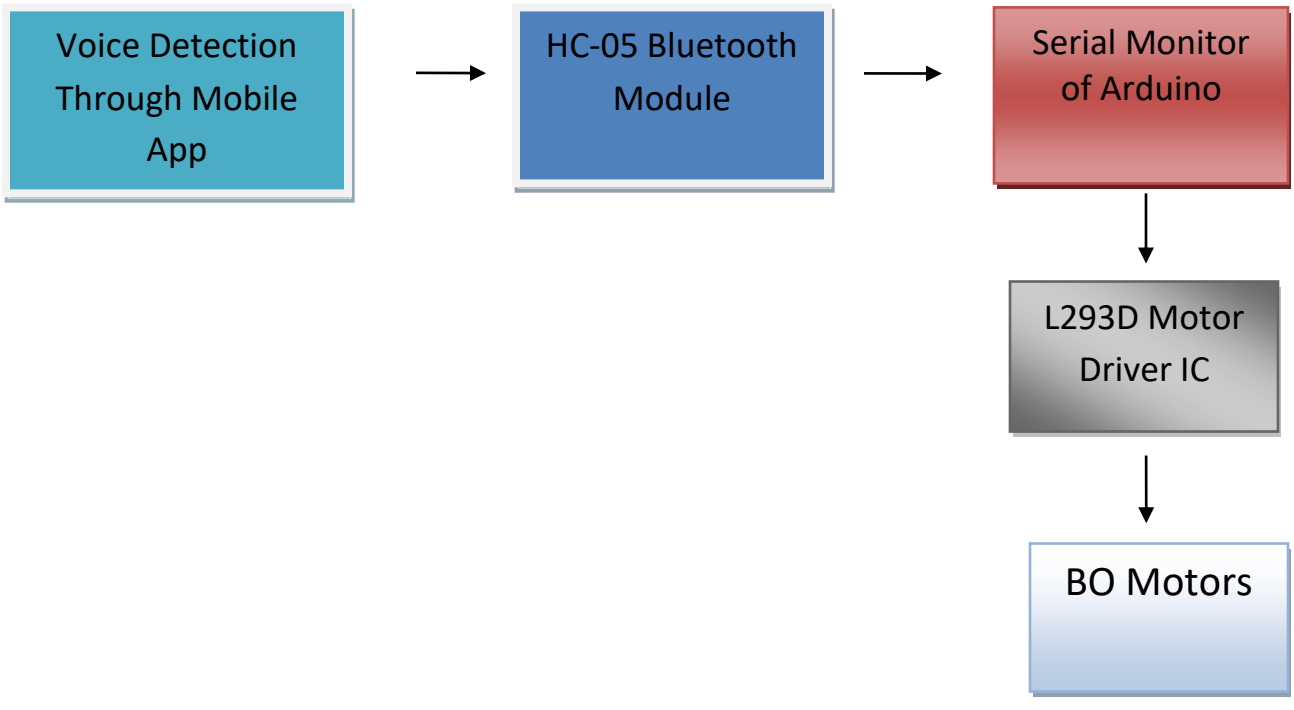
In this project, a voice control car has been made where a voice command is given via a smartphone app through the HC-05 Bluetooth module and this command is used by Arduino UNO and subsequently drives the wheels of the car.

Components Used :-

Sl No	Component	Discrimination	Quantity
1	Arduino UNO With Cable	Atmega 328P.6	1
2	Bluetooth Module	HC 05	1
3	Motor Driver	L293D	1
4	BO Motor with Wheel	100RPM, 3-12 VDC, 40-80mA	2
5	Battery	9 v DC	2
6	Battery Cap	Std Size	2
7	Chasis with Caster wheel	Std Size	1
18	Jumper wires	Male to Male, Male to Female, Female to Female	10 Nos Each

Flow Diagram

This flow chart shows receiving data and actuating motors



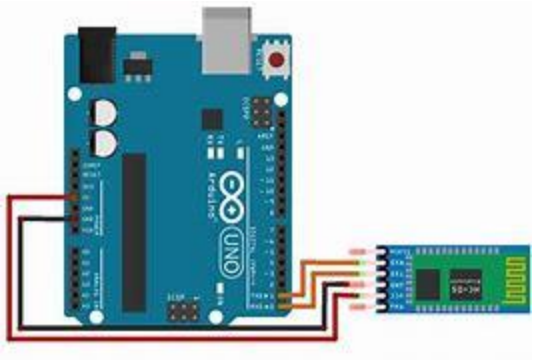
Experimental Setup :-

- Gather all the components and information required for the project.
- Fix the BO motors and Wheels on the Chassis.
- Fix the HC-05 Bluetooth Module and L293D Motor driver IC on the Breadboard
- To get power supply two 9V battery is used one for motor and the other for Arduino Board.
- Write the sketch and uploaded to the Arduino Uno Board.

Circuit Connection:-

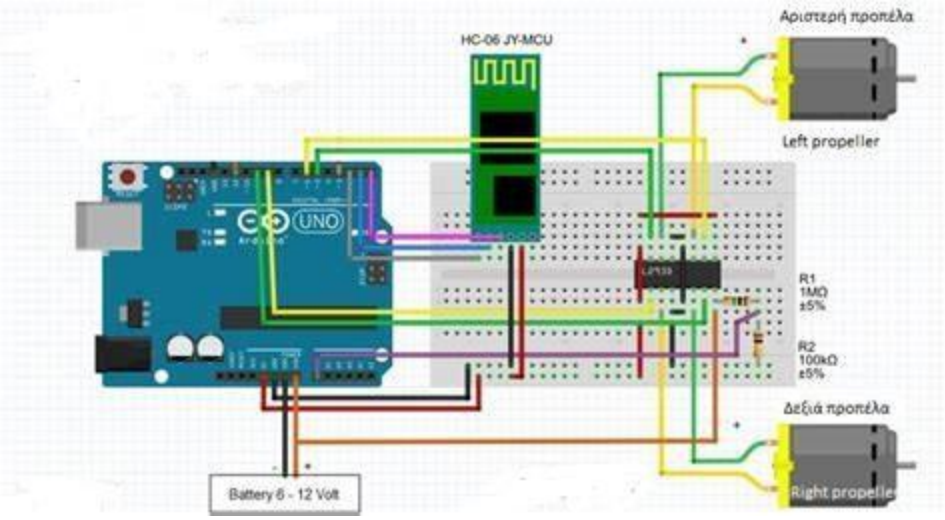
- ### HC-05 Bluetooth Module Connection

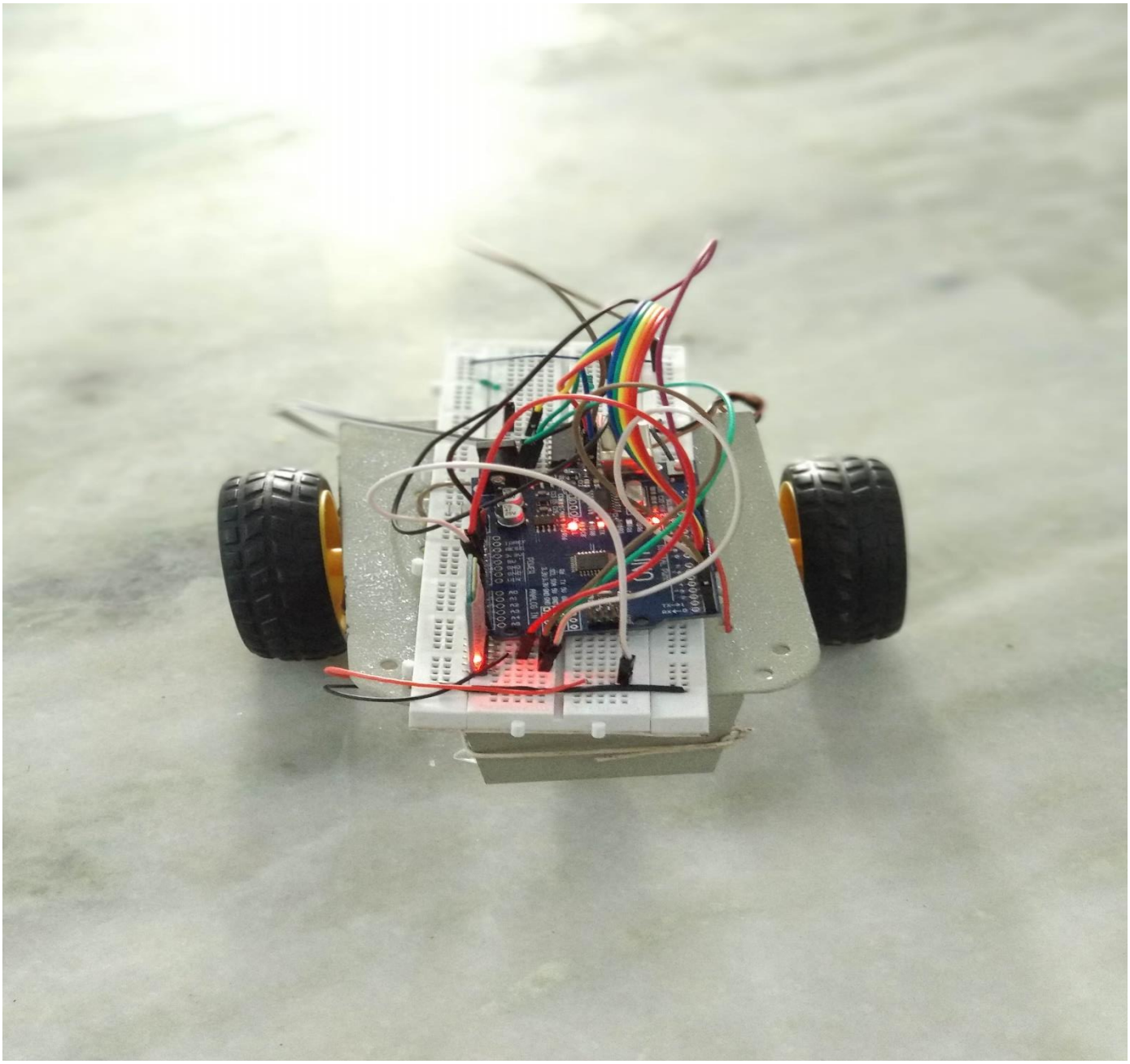
1. It has total 6 pins. State, RX, TX, GND, +5V, EN.
2. RX of HC-05 is connected to TX of Arduino (pin 1).
3. TX of HC-05 is connected to RX of Arduino (pin0).
4. +5V is connected to Vcc of Arduino
5. GND is connected to GND of Arduino.



- ### L293D Motor Driver IC connection :-

1. It has total 16 Pins.
2. Pin 3 and 6 is connected to left motor.
3. Pin 11 and 14 is connected to right motor.
4. Pin 2 & 7 and 10&15 is connected to Arduino for controlling the left motor and right motor respectively.
5. Pin 1&9 is the enable pin for both side it is used for controlling the speed of motor.
6. Pin 8 is power supply for motor.


Αριστερή προπέλα
HC-06 JY-MCU
Left propeller
UNO
R1
1MΩ
±5%
R2
100kΩ
±5%
Δεξιά προπέλα
Battery 6 - 12 Volt
Right propeller



Conclusion

In this project, the design and implementation of Voice Control Car is presented and developed using Arduino UNO board. An algorithm has been provided and its working is detailed thoroughly. Since the updating possibilities are endless, updating the system has been kept as a future scope. The addition of the some additional sensors will make it more productive. The limitation of the hardware being associated with a system has been reduced to a great extent. As an end thought, the system will allow the user to control it in a way that reduces the gap between the physical world and the digital.
Further communication with the Google Assistance for Voice Recognition can reduce our effort where there is no need to give any voice command physically.

Appendix

Code for this project

```
#define m1 2

#define m2 3

#define m3 4

#define m4 5

int led = 10;

int speedPin = 6;

int mSpeed=150;

void setup() {

  pinMode(m1,OUTPUT);

  pinMode(m2,OUTPUT);

  pinMode(m3,OUTPUT);

  pinMode(m4,OUTPUT);

  pinMode(speedPin,OUTPUT);

   pinMode(led,OUTPUT);

  Serial.begin(9600);


}
```

```
void loop() {


 while (Serial.available()==0){


 }
  String voice = Serial.readString();
  Serial.println(voice);
    if (voice=="*forward#"){
     analogWrite(speedPin,255);
     digitalWrite(m1,LOW);
     digitalWrite(m2,HIGH);
      digitalWrite(m3,LOW);
     digitalWrite(m4,HIGH);
     digitalWrite(led,HIGH);
 }
  if(voice == "*backward#")
  {
  analogWrite(speedPin,255);
  digitalWrite(m1,HIGH);
  digitalWrite(m2,LOW);
  digitalWrite(m3,HIGH);
  digitalWrite(m4,LOW);
  }
 if(voice=="*left#")
  {
  digitalWrite(m1,LOW);
  digitalWrite(m2,LOW);
  digitalWrite(m3,LOW);
  digitalWrite(m4,HIGH);
```

```
   analogWrite(speedPin,255);
   delay(10);
   analogWrite(speedPin,mSpeed);
   delay(3000);
   voice="*stop#";
  }
  if(voice=="*right#")
   {
   digitalWrite(m1,LOW);
   digitalWrite(m2,HIGH);
   digitalWrite(m3,LOW);
   digitalWrite(m4,LOW);
   analogWrite(speedPin,255);
   delay(10);
   analogWrite(speedPin,mSpeed);
   delay(3000);
   voice="*stop#";
  }
  if(voice=="*stop#")
   {
   digitalWrite(m1,LOW);
   digitalWrite(m2,LOW);
   digitalWrite(m3,LOW);
   digitalWrite(m4,LOW);
   digitalWrite(led,HIGH);
  }
}
```