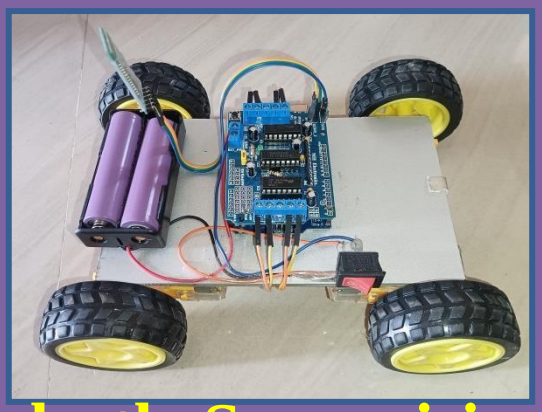
Bluetooth ControlledCarwithArduino



UndertheSupervisionof

SKMP PROJECT MANAGEMENT TEAM&SUPERVISER

DEPARTMENT
OF SKMP
GROUP

Under the supervision of:-

SKMP PROJECT MANAGEMENT TEAM AND SUPERVISER OFFICER

PREPARED FOR:-

DIPLOMA STUDENT GROUP 6TH SEM
BALASORE SCHOOL OF ENGINEERING,BALASORE

Department of ComputerScience&Engineering

BalasoreSchoolofEngineering

BALASORE SCHOOL OF ENGINEERING, BALASORE

CERTIFICATE

THISISTOCERTIFYTHESTUDENTOF6THSEMESTER(COMPUTERSCIENCE&ENGG.) HAVECOMPLETEDOURPROJECTWORKTITLED"BLUETOOTHCONTROLLEDCARWITH ARDUINO"SATISFACTORILYINPARTIALFULFILMENTOFREQUIREMENTOFDIPLOMA COURCEINTHEYEAR2021-2024.

Date:

(Er. Priyanka Panda)	**(SKMP PROJECT MANAGEMENT SUPERVISER)**
Head of the Department	**(Guide)**

(InternalExaminer)	**(ExternalExaminer)**

CANDIDATE'S DECLARATION

Ideclarethatsemesterreportentitled "BluetoothControlledCar withArduino"ismyownworkconductedunderthesupervisionof the (Skmp Project Management team and superviser)

I further declare that to the best of my knowledge the report for diplomafinalsemesterdoesnotcontainpartoftheworkwhichhasbeen submitted for the award of diploma either in this or any other college without Balasore School of Engineering, Ranipatna, Balasore.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

GUIDE CERTIFICATE

This is to certify that the project report entitled "Bluetooth ControlledCarwithArduino"submittedbyAlltheStudentsof Comp. Sc& Eng. Partial fulfillment of their work for the award Diploma (Sem-6) of Balasore School of Engineering, Balasorehas been completed under my supervision & guidance.

Tothebestofmyknowledgethematterpresentedbythemisoriginal in nature and not bee.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

Acknowledgment

This project was completed for the coursework of Diploma final year project, directed by the Department of Computer Science and Engineering, BalasoreSchool of Engineering. Our sincere efforts have madeus accomplish the task of completing the project. Most importantly, we would like to express ourgratitude to our honorable teacher, **the (Skmp Project Management team and superviser)**for his advice and valuable comments regarding our project, which led us to the completion of the project. Our thanks and appreciation also goes to our classmates, who encouraged us to complete our project.

SING OF SKMP PROJECT MANAGEMENT
SUPERVISER / MD(managing director)

Abstract

A remote-controlled vehicle is any mobile machine controlled by means that are physically not connected with the origin external to the machine.

In this project, we make use of Bluetooth technology to control our machine car. We do not call this a robot as this device does not have any sensors. Thereby, senseless robots are machines.The project aims are to design a Bluetooth control Arduino car and write a program into the Arduino microprocessor. Arduino car contains an Arduino microcontroller with basic mobility features. In this project, we make use of Bluetooth technology to control our machine car.

After doing this only we can say that we have been able to create as per our goal described. The device can be controlled by any smart device with android. The major reason for using a Bluetooth-based tech is that we can change the remote anytime – mobile phones, tablets, and laptops and physical barriers like walls or doors do not affect the car controls.

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ListofAbbreviation

ROSCOSMOS: RussianFederalSpaceAgencyTechnology,Space, Astronomy

RC: Radio/RemoteControl

LCD: Liquid-crystaldisplay

LI-ONBattery: Lithium-IonBattery

NASA: NationalAeronauticsandSpaceAdministration.

USB: UniversalSerialBus

Chapter-01

Introduction

Background:

Wireless or Bluetooth control cars are developed to make our day-to-day life easy and simpler. Today for striving in this modern era it is necessary to use modern technology to simplify our day-to-day activities. Thousands of people die because of driving vehicles. If it can be remote-controlled, we will be able to save thousands of lives. The drone started a revolution in this regard. Bluetooth-controlled cars can be a revolutionary project for our upcoming future. It can be used for low-range mobile surveillance devices, (military Applications where no human intervention will be needed), Assistive devices (like wheelchairs), home automation, etc. It is aimed to bring a huge groundbreakingchange in society by overcoming the hurdles we are facing today. Driverless cars are providing mobility to many people who cannot drive which isan added advantage to commuters who wish to use cars on dailybasis. Bluetooth control cars are the gadget of the future.

Problemstatement:

Bluetooth Control cars can be a helping hand for the cripples, or for the ones who want to drive but are unable due to many physical inabilities, where human life is at risk, we can use it from a very distance as it is fully wireless.

ProjectOverview:

The main processing unit consists of Arduino UNO to perform specified operations. Arduino UNO board is used as the main microprocessor of the device. It will run and will control the movement of the vehicle through the use of the motor driver who will control the wheels. The Programs are compiled using Arduino IDE and then the sketch is uploaded to the board using a pc and a USB cable. Speed variations can be achieved bymaking slight changes to the sketch. It is based on a 4-wheel drive platform integrated with an ultra-sonic sensor to avoid obstacles and line tracer sensors. It also has an infra-red remote controller for the manual steering of the vehicle. The car is upgradable and can replace, upgrade and expand the input sensors and add other functionality by adding other modules.

Chapter-02

LiteratureReview

Wireless control is one of the most important basic needs for all people all over the world. Bluetooth is one of themost used wireless technologies. A Bluetooth control car is such a car that can be controlled wirelessly using a Bluetooth control system and Arduino. With the combination of Arduino, and Bluetooth we cancontrol many other things, like home Lighting, air conditioners, and many more through our cell phones. The Arduino can also contribute at large to the Smart Home system. Nowadays it has made us easier to convert digital signals into physical movements with such microcontrollers.

Today people are using autonomation in every sector. There are many benefits, for example, it reduces theriskofinjury, it is fast, it can work daylong, it is reliable,etc. This Bluetooth control car is just an example of autonomation. This type of car is used in law enforcement and military engagements for some the reasons like Hazard exposure which is controlled from a location of relative safety. Such vehicles are used by many police department bomb squads to defuse or detonate explosives.

These vehicles are also used in space exploration, by using such vehicle NASA. ESA and ROSCOSMOShaveexploredandcollectedmanydatafromspace,themoon,andmars.Inrecent days giant companies are using remote control vehicles to deliver their products. And Many of the giant factories have their transportation which is remotely controlled.

Here we have connected this 4-wheeler with Arduino and Bluetooth Module/ There isan Android application that is already installed in the remote device. We send our instruction to the vehicle with that application, that application is connected with the module in the vehicle. Bluetooth module transfer that instruction as a signal to the Arduino, and Arduino works with that signal. In the Arduino, we have installed the code which can work with the signals and convert those instructions to the pre-defined signals. Signals were transferred to the motors, and the car started running.

This car does not have advanced features but we can attach any kind of features like line detecting,orobstacledetecting,eventhoughwecanattachthecameratothevehicleandwatchit with the remote. This one is just a basic prototype of a remote-control car, we can add a lot of advanced features and get an armed/especially capable RC Car.

This project aimed to design an automated vehicle prototype built with Arduino and controlled with software developed on Android that can perform manual or automatic paths. Until now research and analyzing the simulation of experiments shown, it is believed that it is feasible to use the prototype designed for cognitive development, for future users can learn to insert custom paths that can process logic issues and more complex mathematics allowing the prototype to perform the desired movements. Analyzing the financial costs of design, it is believed that it is feasibleto construct thistypeofprototypebecauseit presents alow cost ofthecomponents used, particularlyiftheyare chosen in a largescale production. It is worth noting that both the Arduino programming language and the language for Arduino in development are free, not burdening additional costs for the development of the project, pointing out that this applies also to the tools used for development.

Chapter-03

Methodology

Tools:

- **Chassis(Includingmotorsandwheels):**

Themainbodyofthecarconsistsofthechassis. Alongsidetherewillbefourmotorsfor the four wheels which will lead down the car.

Figure-01:Chassis(Includingmotorsandwheels)

- **ArduinoUno:**

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed byArduino. cc. The board is equipped with sets of digital and analog input/output pins that maybe interfaced with various expansion boardsand other circuits.

Figure-02:ArduinoUnoR3

- **L293DMotorDriverShield:**

The Motor Driver is a module for motors that allows you to control the working speed and direction of four motors simultaneously. This Motor Driver is designedand developed based on L293D IC. L293D is a 16 Pin Motor Driver IC. This is designed to provide bidirectional drive currents at voltages from 5 V to 36 V. Rotation of a motor depends on the enabled pins.

Figure-03:L293DMotorDriver Shield

- **JumperWires:**

A jump wire (also known as jumper, jumper wire, DuPont wire) is an electrical wire, or groupofthem in a cable, with a connectoror pin ateach end (orsometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.

Figure-04:JumperWires

- **Battery:**

A battery is an energy source consisting of one or more electrochemical cells and terminals on both ends called an anode (-) and a cathode (+). Here for the project, a 9V battery has been used. (In figure 5)

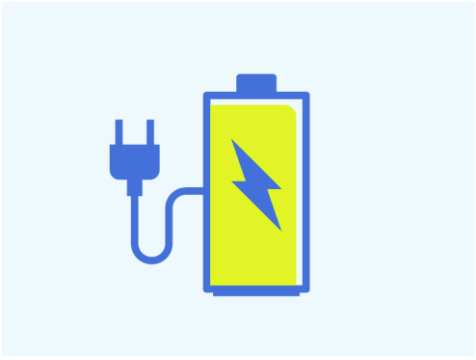

Figure-05:Battery

- **Switch:**

  Infigure06,Aswitchisusedforturningonthepowerofthevehicle.Itcontrolsthe battery connection of the vehicle.

Figure-06:Switch

- **Bluetooth Module:**

  In figure 7 HC-05 6 Pin Wireless Serial Bluetooth Module is a Bluetooth module for use with any microcontroller. It uses the UART protocol to make it easy to send and receive data wirelessly. The HC-06 module is a slave-only device. This means thatitcanconnect to most phones and computers using Bluetooth technology.

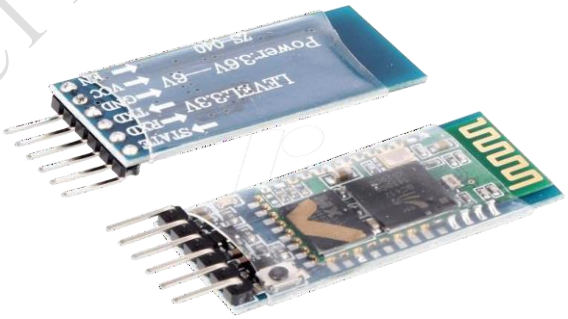

Figure-07: BluetoothModule

PinDiagram&Connection:

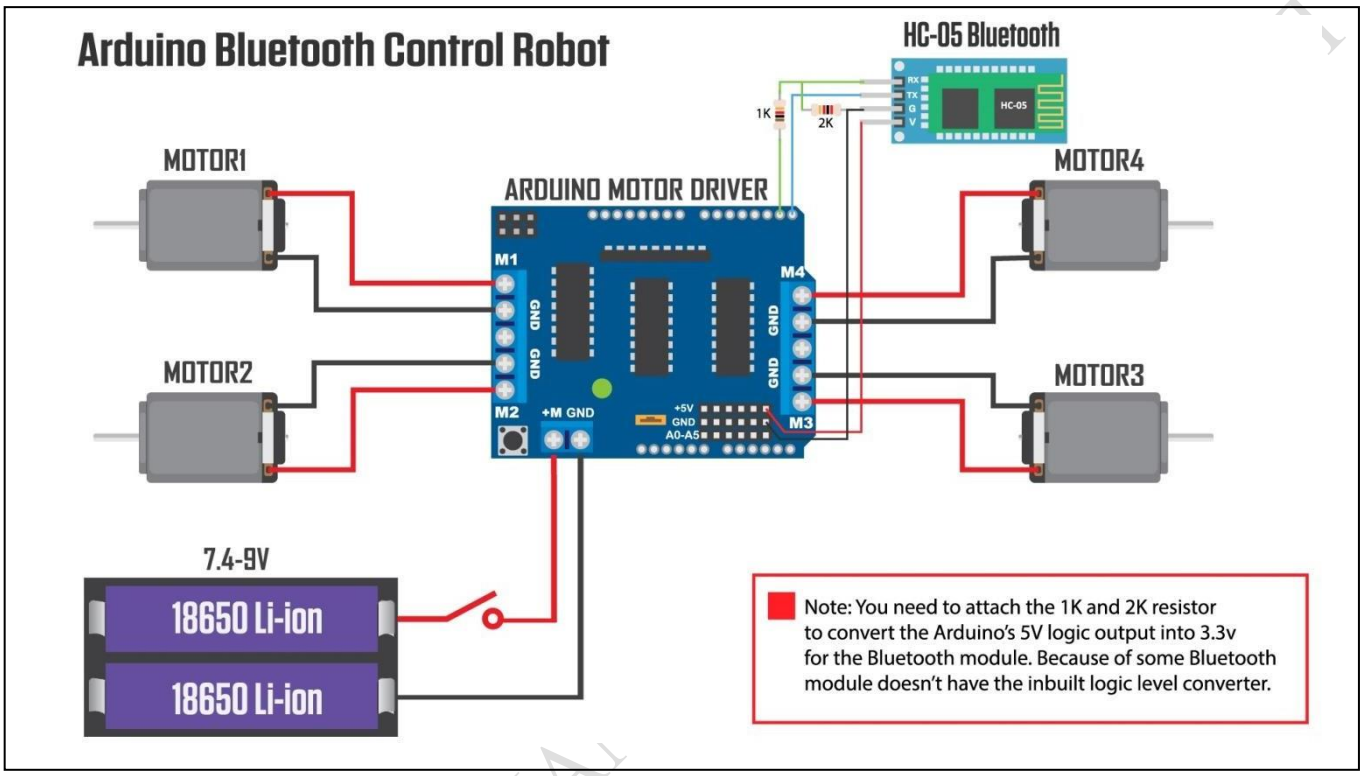

Figure-08: PinDiagram&Connection

SourceCode:

```
#include<AFMotor.h>

//initialmotorspin
AF_DCMotormotor1(1,M
OTOR12_1KHZ);
AF_DCMotormotor2(2,M
OTOR12_1KHZ);
AF_DCMotormotor3(3,M
OTOR34_1KHZ);
AF_DCMotormotor4(4,M
OTOR34_1KHZ);
charcomma
nd; void
setup()
{
Serial.begin(9600);//SetthebaudratetoyourBluetooth
module.
}


void loop(){
if(Serial.available
()>0)
{
command=Serial.read();
```

```
Stop();//initializewithmotorsstoped
//Changepinmodeonlyifnewcommandisdifferentfromprev
ious.
//Serial.println(co
 mmand);
 switch(command){
    case
    'F':
    forwa
    rd();
    break
    ;
    case
    'B':
    back(
    );
    break
    ;
    case'
    L':
    left(
    );
    break
    ;
    case'
    R':
    righ
```

```
        t();
        brea
        k;
            }
        }
}
```

```
voidforward()
{
    motor1.setSpeed(255); //Define
    maximum velocity
    motor1.run(FORWARD);//rotatethemot
    orclockwise motor2.setSpeed(255);
    //Define maximum velocity
    motor2.run(FORWARD);//rotatethemot
    orclockwise
    motor3.setSpeed(255);//Define
    maximum velocity
    motor3.run(FORWARD);//rotatethemot
    orclockwise
    motor4.setSpeed(255);//Define
    maximum velocity
    motor4.run(FORWARD);//rotatethemot
    orclockwise
}

voidback()
{
    motor1.setSpeed(255); //Define
    maximum velocity
    motor1.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor2.setSpeed(255); //Define
    maximum velocity
```

```
    motor2.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor3.setSpeed(255); //Define
    maximum velocity
    motor3.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor4.setSpeed(255); //Define
    maximum velocity
    motor4.run(BACKWARD);//rotatethemo
    toranti-clockwise
}

voidleft()
{
    motor1.setSpeed(255); //Define
    maximum velocity
    motor1.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor2.setSpeed(255); //Define
    maximum velocity
    motor2.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor3.setSpeed(255); //Define
    maximum velocity
    motor3.run(FORWARD);//rotate the
    motor clockwise
    motor4.setSpeed(255); //Define
```

```
    maximum velocity
    motor4.run(FORWARD);//rotate the
    motor clockwise
}

voidright()
{
    motor1.setSpeed(255); //Define
    maximum velocity
    motor1.run(FORWARD); //rotate the
    motor clockwise
    motor2.setSpeed(255); //Define
    maximum velocity
    motor2.run(FORWARD); //rotate the
    motor clockwise
    motor3.setSpeed(255); //Define
    maximum velocity
    motor3.run(BACKWARD);//rotatethemo
    toranti-clockwise
    motor4.setSpeed(255); //Define
    maximum velocity
    motor4.run(BACKWARD);//rotatethemo
    toranti-clockwise
```

```
}

voidStop()
{
    motor1.setSpeed(0); //Define minimum
    velocity
    motor1.run(RELEASE);//stopthemotorwhe
    nreleasethebutton motor2.setSpeed(0);
    //Define minimum velocity
    motor2.run(RELEASE); //rotate the
    motor clockwise motor3.setSpeed(0);
    //Define minimum velocity
    motor3.run(RELEASE);//stopthemotorwhe
    nreleasethebutton motor4.setSpeed(0);
    //Define minimum velocity
    motor4.run(RELEASE);//stopthemotorwhe
    nreleasethebutton
}
```

flowchartofImplementation:

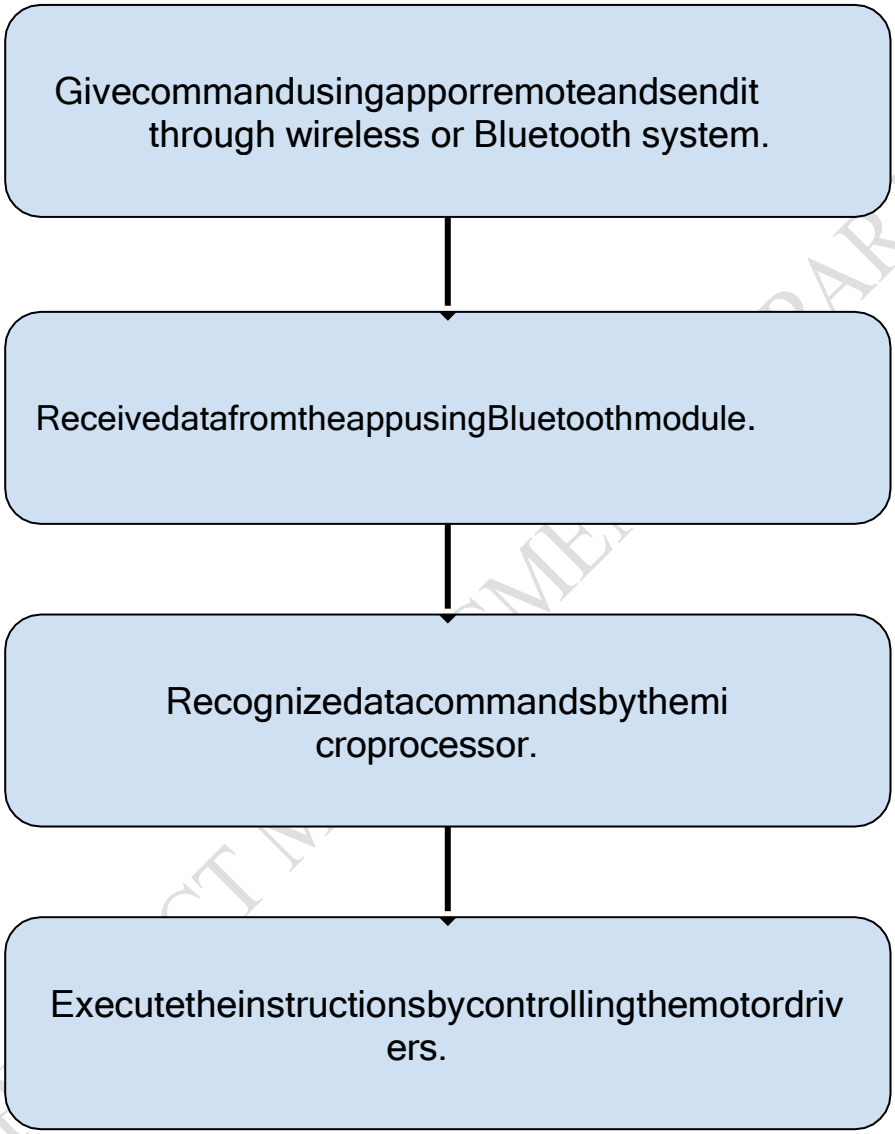

Figure-09:FlowchartofImplementation

ComponentsofBluetoothControlCar:

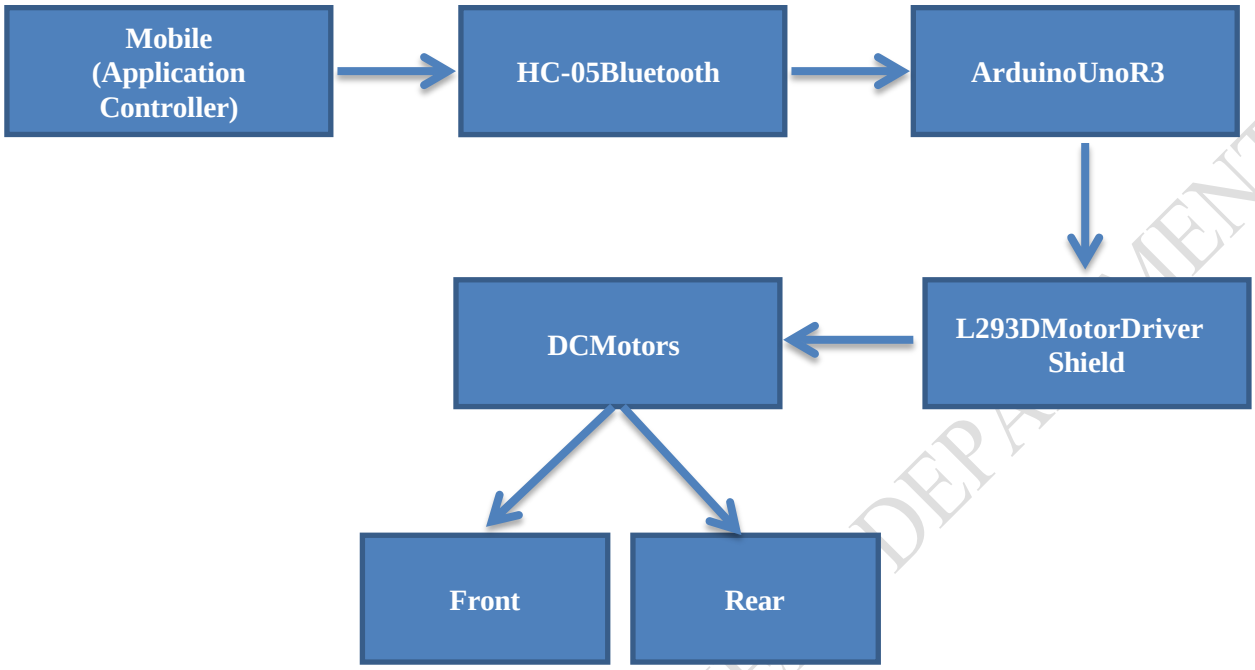

Figure-10:ComponentsofBluetooth Car

ApplicationController:

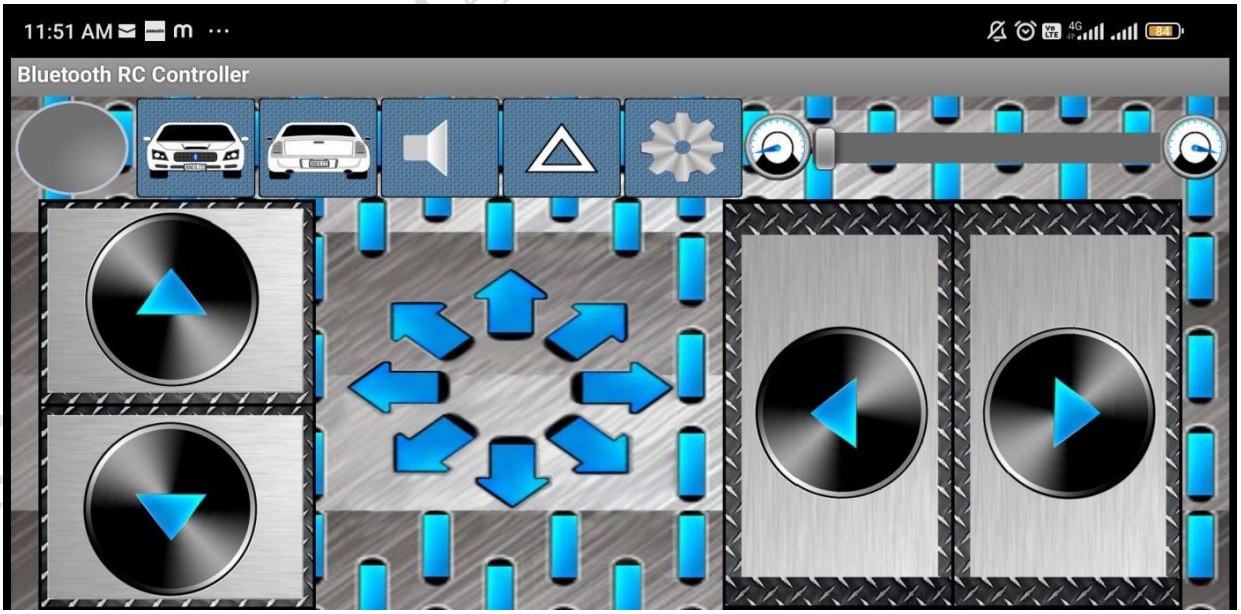

Figure-11:MobileApplicationController

Chapter-04

ResultandDiscussion

The prototype is created using 4 DC motors driven by an H-bridge with dual output, connecting the two left wheels and the two right ones to its outputs. The car is remotely controlled either by Bluetooth an app or by infrared. Some extra functionalities can be added to the software.

Better line tracking mode: When the robot finds an object in front placed on the line, it will try to go around it until it finds the line again, continuing afterward. This function can be added using an ultrasonic sensor.

Custom mode: Theabilityto program the prototype from the app has not been implemented, as it is relatively easy to use the custom mode by modifying the code.

Chapter-05

Conclusion

This project consists of a basic prototype of a Bluetooth control car above stated. The prototype car can recognize commands from users and can turn the car left, right, and stop with great accuracy. It can be further improved by using different sensors like ultrasonic or infrared and with various levels of coding.

Our Bluetooth control car has a range of 10-20 meter with the mobile Bluetooth controlling system. The range mostly depends on the receivers transmission level.

In the future, we could use rechargeable batteries like Ni-Cd Battery or Li-ion batteries thatcould avoid the present disadvantage. Also, we could make use of this RC Motor Car as a surveillance system or rovers by adding a few more sensors and updating the code. This would make them into robots. These robots could self-monitor under any human supervision, thereby reducing manpower. These are just the alternatives, on which this project could be improvised and updated.

IoT or the internet of things is a very important part of both computers and our daily lives. The above model describes how the Arduino programs the car motor module and by IoT, we rotate the wheels and give direction to the car. IoT allows us to work with different platforms and it helps us to create various interesting modules to work on.

With the ever-increasing problems, our knowledge has to expand to adapt better to the changes all around us. In the same way, it is hoped that this activity is a small step that would lead us to further enhancements and goals.

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