PROJECT REPORT
ON
"AVYAM- THE COVID SAVIOUR"

Submitted in partial fulfillment of the requirement for the semester VIII of

BACHELOR OF TECHNOLOGY
IN
INFORMATION TECHNOLOGY

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TO

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DECLARATION

We, hereby declare that the work presented in this dissertation entitled "**AVYAM- THE COVID SAVIOUR**" an Arduino-based Bluetooth control bot for helping home quarantined COVID-19 patients has been done by us, and this dissertation embodies our own work.

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SYNOPSIS

Topic:

AVYAM- THE COVID SAVIOUR

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Languages Used:

C

About:

An Arduino-based, BlueTooth controlled bot that can be employed in the houses of home quarantine Covid-19 patients for delivering the necessary items to their room thus ensuring a contactless delivery.

Uses:

· Contactless delivery to the Covid-home quarantined patient.
· Delivery of items through Bluetooth control

Objective

Smartphone has quite changed the traditional ways of human to machine interaction. The smartphone is now a vital part of a person's life. Android is a software platform for mobile devices that includes an operating system, middleware, and key applications. Android is a safe and secure operating system. All of its essential tools are combined in software called SDK which stands for Software Development Kit. We know that all manual operations have been replaced by automated mechanical operations.

According to guidelines, Detection of a travel-related/unrelated suspect case of novel Coronavirus Disease will be followed by rapid isolation of cases in designated health facilities and line listing of all contacts of such cases. Home quarantine applies to all such contacts of a suspect or confirmed case of COVID-19. During the home quarantine phase, the first and important point is that the patient should stay in a separate room. If this is not possible, then they should have a designated part of the home and their movements around the house should be limited. Also, there should be kept one meter, at least one-meter distance between them and anyone else.

Our main objective of writing this paper is to build an Arduino-based, BlueTooth controlled bot that can be employed in the houses of home quarantine Covid-19 patients. which can deliver the requirements of the patient to their rooms thus ensuring contactless transfer of food, water, and other things so that the other members of the house will remain free of covid patient's contact and be safe from getting infected.

HARDWARE AND SOFTWARE REQUIREMENTS

Hardware

- Arduino Uno
- HC -05 BT Module
- Motor Driver Shield L293D
- 4 Motor (12V Each)
- Jumper wires
- Battery (12Volt)
- Robot Chasis
- Android Phone
- Storage Box

Software

- Arduino IDE
- Bluetooth Controlling App

LITERATURE SURVEY

Various researches have been made by different researchers for developing this project. However, they serve a different application and have different technologies implemented. Some of those papers are mentioned below stating their technology and application.

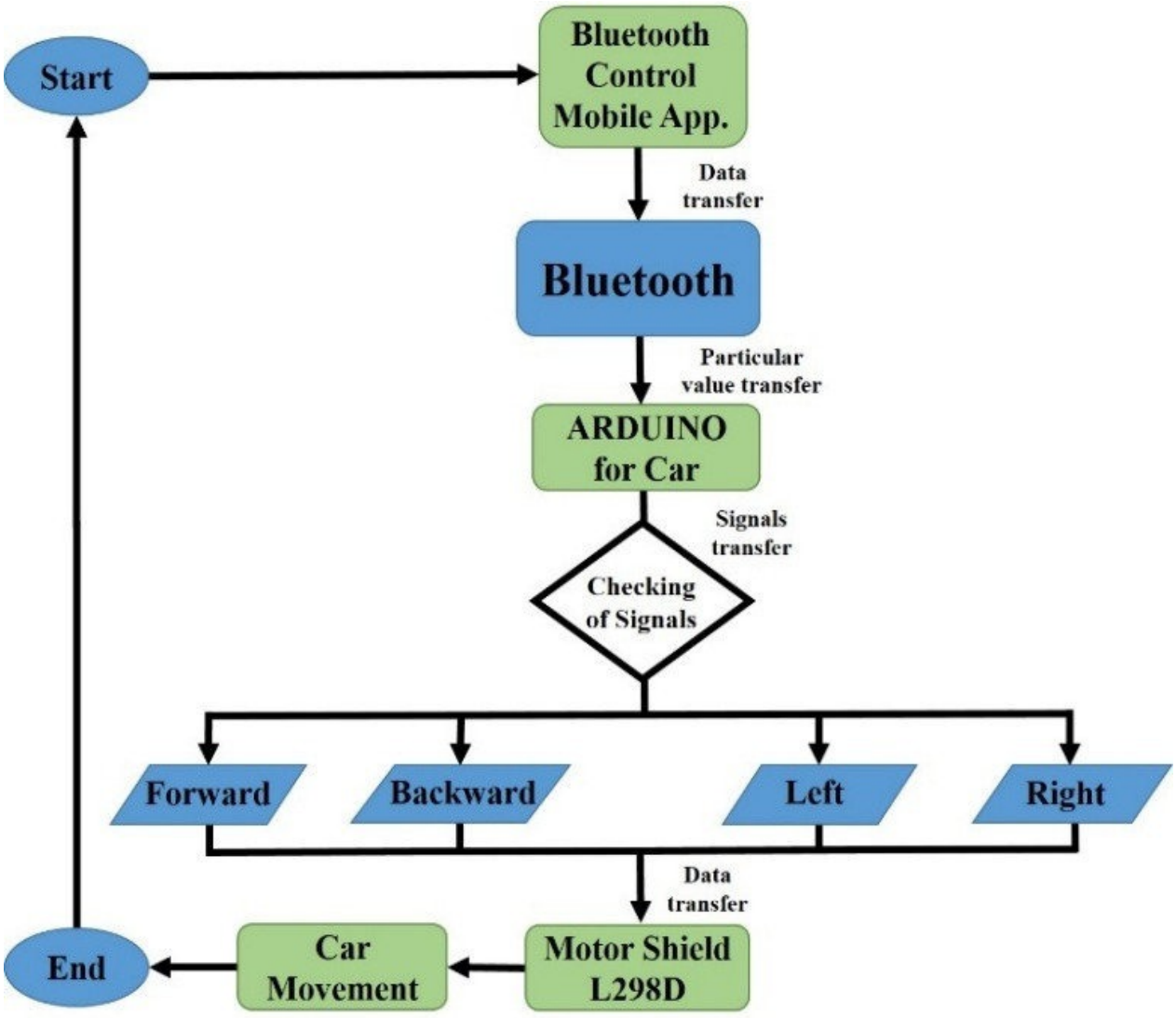
Jorge Kazacos Winter has developed android controlled robot automation. The main aim of his project was the transfer of information wirelessly between a smartphone and the robot and developing the robot and its communication system underneath a low price and open source philosophy. He used a 3D design technique to style the structure of the robot with the facilitation of parametrical modeling software. The style, when fed to the 3D printer can print the parts of the robot in a layered manner one by one and can then use these parts to assemble the robot simply. He has used Arduino micro-controller and Wi-Fi technology in this robot.

M. Selvam in his paper has designed to develop a robotic system that has a wireless camera attached to the surveillance. Bluetooth was implemented in his project for providing a connection between robot and smartphone. A wireless night vision camera was used for providing remote surveillance. The video which is recorded by the camera is then transmitted to the TV unit through a Radio Frequency signal. He used 8051 microcontrollers for the robotic unit.

Ranjith Kumar Goud and B.Santhosh Kumar [3] have invented a pick and drop robot. They wanted it to be used for diffusing a bomb remotely with safety. For the robotic arm, they used a pair of motors and another pair as the wheels of the robot for controlling the movement. Connectivity is established using Bluetooth. The micro-controller used is LPC2148. They had also attached a wireless camera for remote surveillance. They have worked on this project mainly for industrial and military applications.

PROPOSED METHODOLOGY

Avyam is controlled by using an Android mobile phone. It needs to touch the button in the android phone to control the car movement in forward, backward, left, and right directions. So the android phone is used as transmitting device. The device components are Arduino, DC motors, Motor Driver L293D, Battery, and Bluetooth module HC-06.



The Bluetooth module is placed in the car is used as a receiver. Bluetooth modules have two different modes one is master mode and the second one is slave mode. The bot has two DC Motors at each of its front and rear side. For giving direction to the bot means turning it left or right side motor1(M1) and motor 2(M2) are motioned in the same direction and motor3(M3) and motor4(M4)are motioned in the opposite direction of motor1 and motor2. For instance, if we have to turn right, then M1 and M2 will be motioned backward and M3 and M4 will be motioned forward and vice versa.

To drive the bot forward all the motors have to motioned in the forward direction and to drive the bot backward all the motors have to be motioned in the backward direction.

We have 4 keys as Forward, Reverse, Left, Right in the Android App. The corresponding data associated with each key is as follows:

	M1	M2	M3	M4
Forward	F	F	F	F
Backward	B	B	B	B
Left	F	F	B	B
Right	B	B	F	F

When a key is pressed, the corresponding data is transmitted to the Bluetooth Module from the Phone over Bluetooth Communication.

In the Arduino code, the Arduino UNO receives any of this data from the Bluetooth Module (as per the key pressed) and performs a simple switch case operation, where each case is associated with appropriate instructions to the Motor Driver Input Pins.

For example, if the ‘Forward’ key is pressed in the Android Phone, then ‘F’ is transmitted. Arduino will then make IN1, IN2, IN3, and IN4 as HIGH to achieve a forward motion.

Similarly, other keys correspond to the appropriate setting of IN1 – IN4 pins.

The Bluetooth module HC-06 has four pins: VCC, GND, TX, and RX. It is not difficult to connect it to Arduino. The following table describes how to map these pins to Arduino Uno:

HC-06	Arduino Uno Pin
VCC	5 V
GND	GND
TX (Data Output)	0 (RX)
RX (Data Input)	1 (TX)

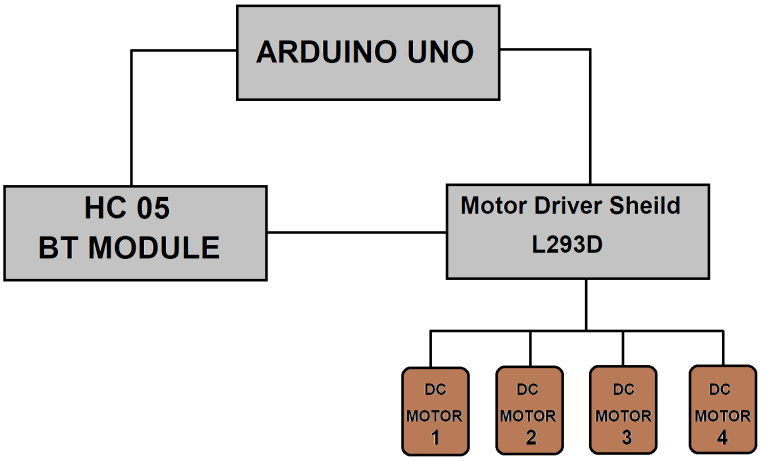
WORKFLOW

WEIGHT DISTRIBUTION

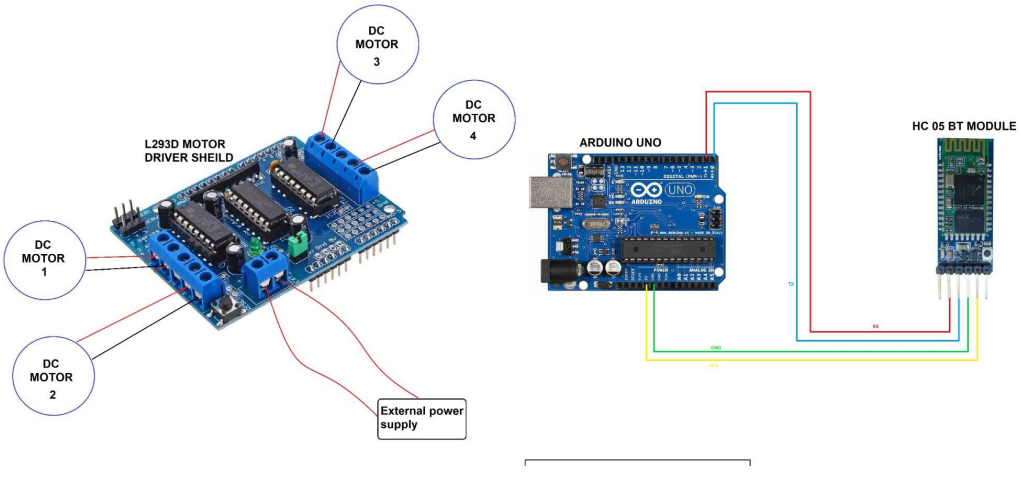
The maximum load the bot can carry: 4kg

Weight of the battery: 1kg
Maximum weight for requirements (eg. 1 time meal,water etc) : 2kg
Miscellaneous: 1kg

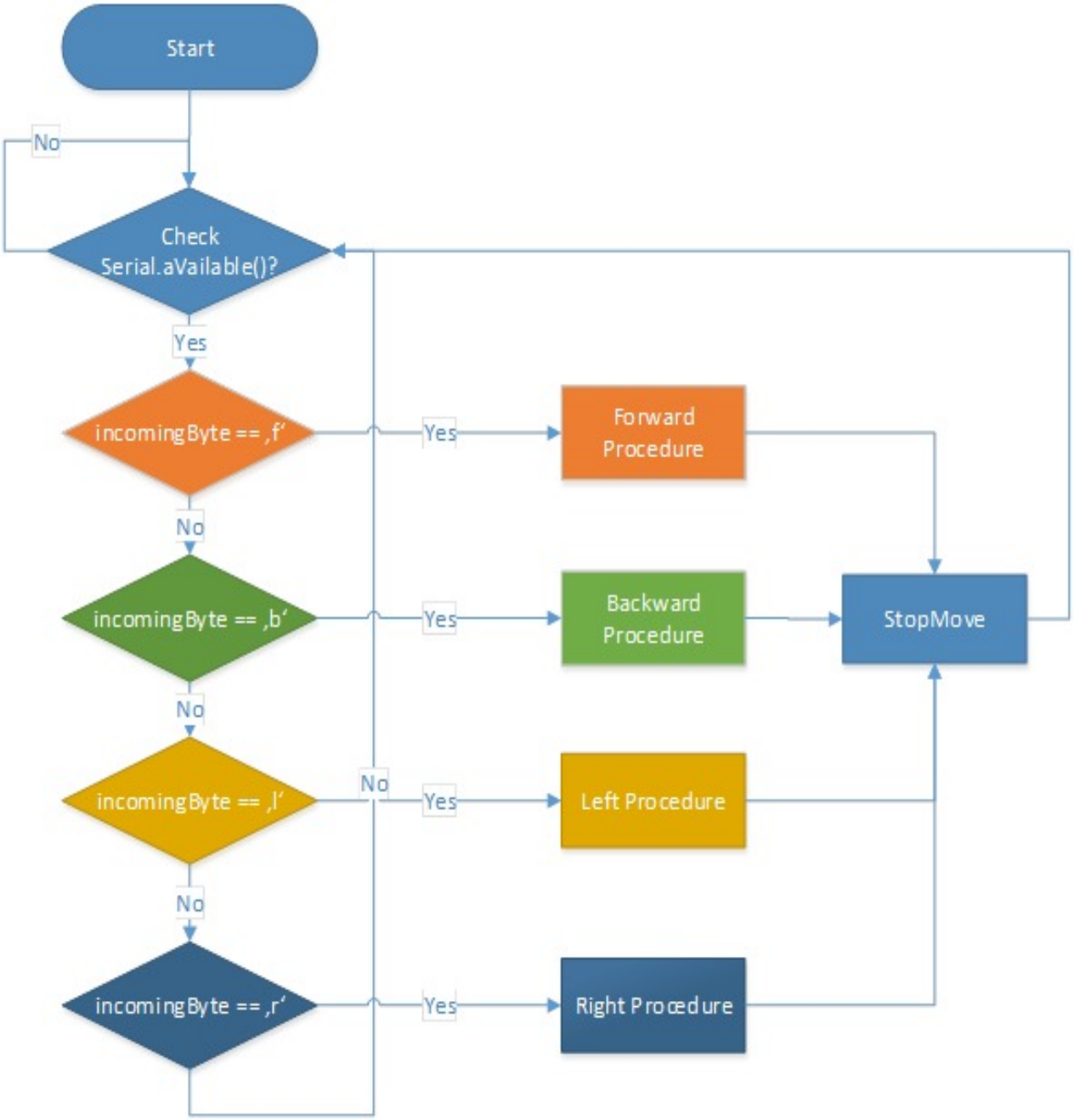
BLOCK DIAGRAM



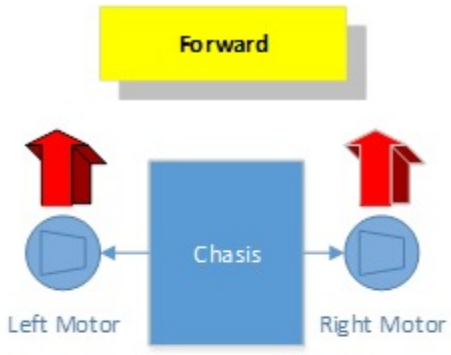
CIRCUIT DIAGRAM

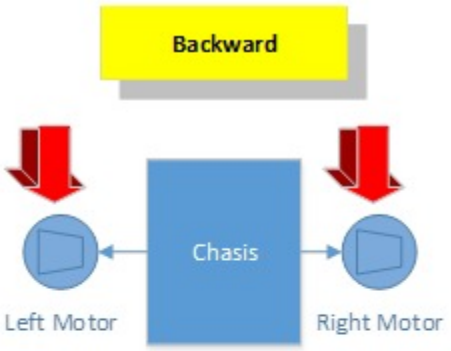


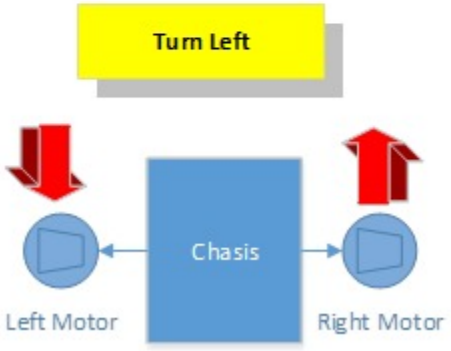
CODE WORKING

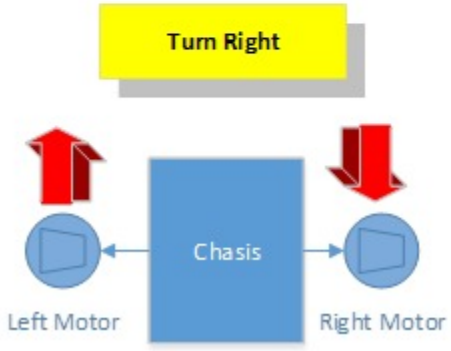


CONTROL DIRECTIONS



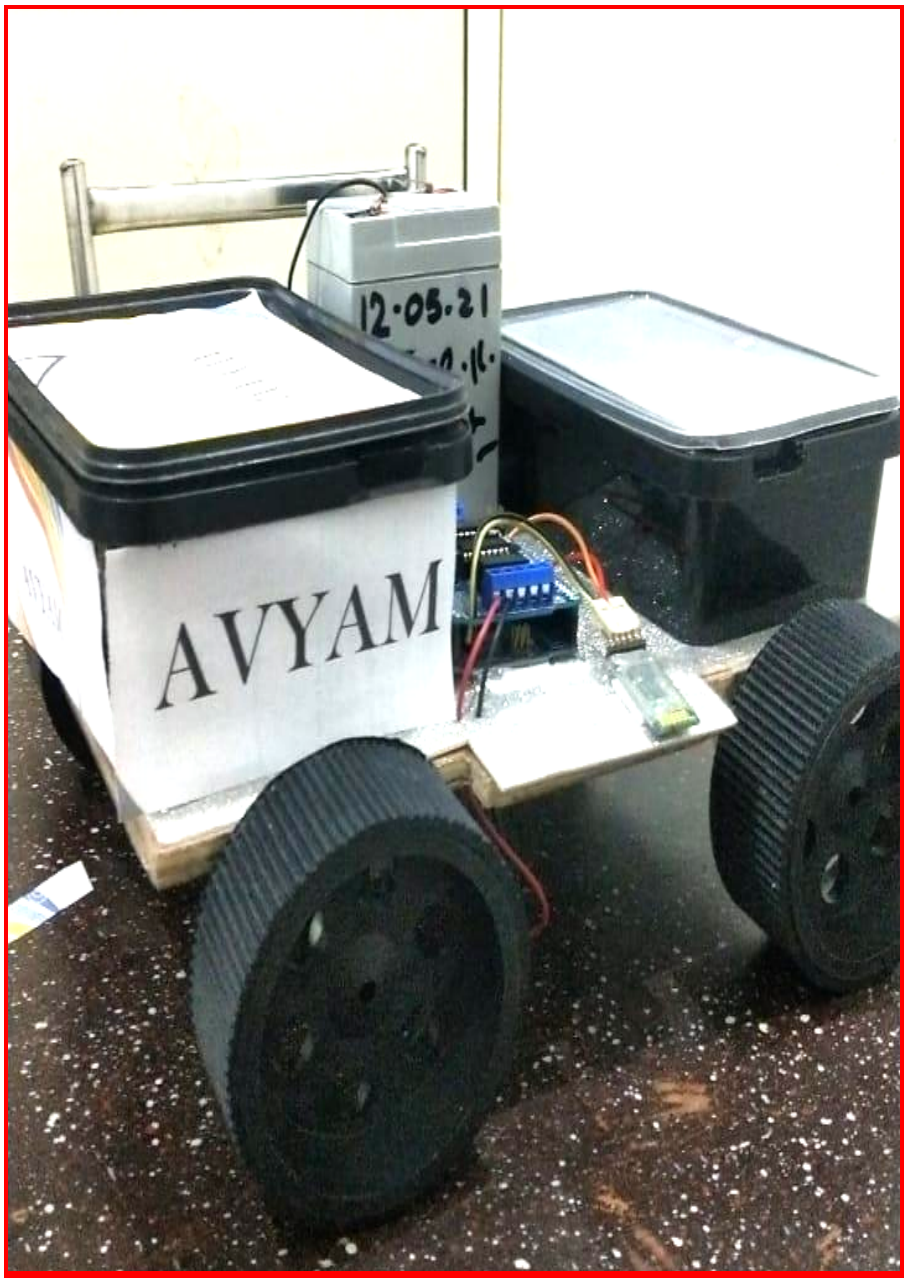






RESULTS AND SNAPSHOTS

After simulating the circuit connections, it will be used to deliver the necessary requirements needed by any home-quarantined patient to his room thus reducing the risk of contact with other members of the house. Connections were made as per the circuit diagram and the file of the code of Arduino was attached to the Arduino Uno.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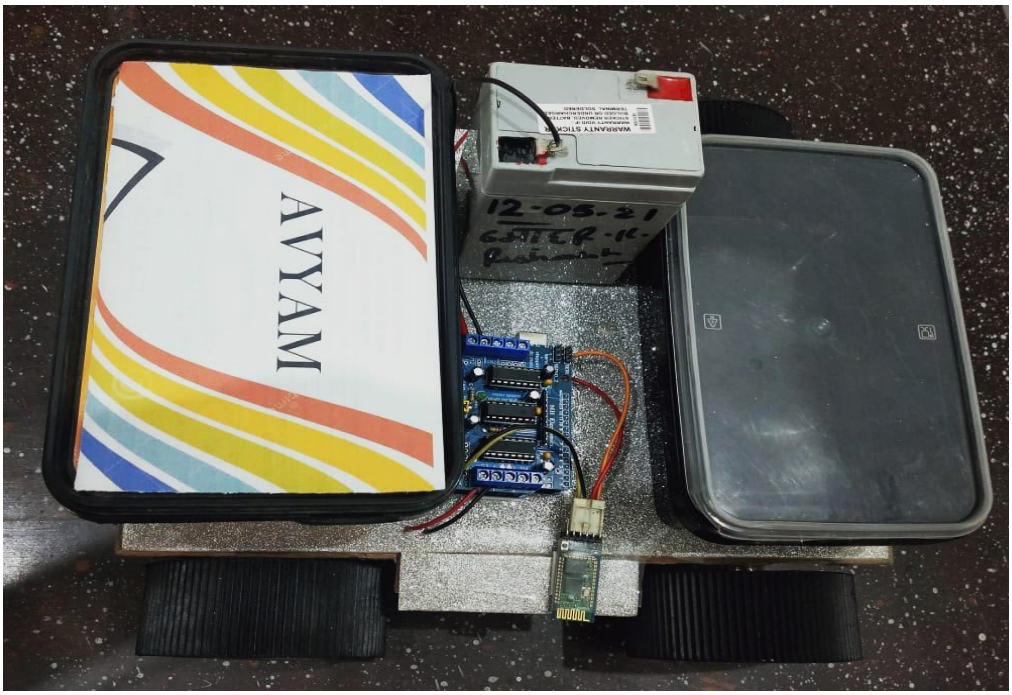
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AVYAM

FUTURE SCOPE

- The mobile application of this project can be brought on other mobile operating systems like iOS & windows phones.
- Using Wi-Fi direct/cellular network instead of a Bluetooth module, so that the range of the Arduino car be increased to a larger scale.
- Applying the project concept of guiding through a mobile device to a quadcopter, so that we can cover the aerial view of the surrounding.

CONCLUSIONS

Thus, in this project, We have programmed Arduino and designed the RC car as shown in the diagram previously. The car will receive the commands via Bluetooth and move accordingly. It will be used to deliver the necessary requirements needed by any home-quarantined patient to his room

The working is based on Android OS, Arduino, L298N motor, DC motor driver, temperature sensor-DHT11, and Bluetooth module. The Arduino code is simulated on software and interfaces with the hardware. The device can be controlled by any smart device with android. AirDroid is an app exclusive to Android which enables you to connect your device to a PC through a Wi-Fi controller of the wireless network. It is used to connect the mobile camera to view in our pc to fixing in the car. It also used to view the location of the car.

CODE :

```
#include <AFMotor.h>

//initial motors pin
AF_DCMotor motor1(1, MOTOR12_1KHZ);
AF_DCMotor motor2(2, MOTOR12_1KHZ);
AF_DCMotor motor3(3, MOTOR34_1KHZ);
AF_DCMotor motor4(4, MOTOR34_1KHZ);

char command;

void setup()
{
  Serial.begin(9600);  //Set the baud rate to your Bluetooth module.
}

void loop(){
  if(Serial.available() > 0){
    command = Serial.read();
    Stop(); //initialize with motors stoped
    switch(command){
    case 'F':
      forward();
      break;
    case 'B':
       back();
      break;
    case 'L':
      left();
      break;
    case 'R':
      right();
```

```
      break;
    }
  }
}

void forward()
{
  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(FORWARD); //rotate the motor clockwise
  motor4.setSpeed(255);//Define maximum velocity
  motor4.run(FORWARD); //rotate the motor clockwise
}

void back()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(BACKWARD); //rotate the motor anti-clockwise
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(BACKWARD); //rotate the motor anti-clockwise
  motor3.setSpeed(255); //Define maximum velocity
  motor3.run(BACKWARD); //rotate the motor anti-clockwise
  motor4.setSpeed(255); //Define maximum velocity
  motor4.run(BACKWARD); //rotate the motor anti-clockwise
}

void left()
{
  motor1.setSpeed(255); //Define maximum velocity
  motor1.run(BACKWARD); //rotate the motor anti-clockwise
  motor2.setSpeed(255); //Define maximum velocity
  motor2.run(BACKWARD); //rotate the motor anti-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
```

```
}

void right()
{
  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); //rotate the motor anti-clockwise
  motor4.setSpeed(255); //Define maximum velocity
  motor4.run(BACKWARD); //rotate the motor anti-clockwise
}

void Stop()
{
  motor1.setSpeed(0); //Define minimum velocity
  motor1.run(RELEASE); //stop the motor when release the button
  motor2.setSpeed(0); //Define minimum velocity
  motor2.run(RELEASE); //rotate the motor clockwise
  motor3.setSpeed(0); //Define minimum velocity
  motor3.run(RELEASE); //stop the motor when release the button
  motor4.setSpeed(0); //Define minimum velocity
  motor4.run(RELEASE); //stop the motor when release the button
}
```

REFERENCES :

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- https://www.seeedstudio.com/blog/2020/01/16/20-awesome-arduino-projects-that-you-must-try-2020/
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