

CUPRINS

1. Specificatie proiect
2. Componente necesare + Schema electrica
3. Implementare + DOC
4. Cum se utilizeaza?

1. Specificatie proiect

Am construit o masinuta care sa poata fi controata prin bluetooth de pe telefon. Masinuta se opreste automat daca intalneste un obstacol in fata. De asemenea masinuta are stopuri, faruri, claxon si semnalizari. "Farurile" masini se aprind automat

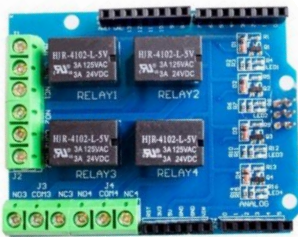
atunci cand luminozitatea este scazuta, ”Stopurile” se sting cand masina este in miscare. In aplicatia de pe telefon este afisata distanta de la masinuta pana la obstacolul pe care il are in fata.

2. Componente necesare + Schema electrica

Componente necesare :



Placă de dezvoltare
compatibilă UNO R3 CH340



Placă expansiune 4 rele 5v



Modul Bluetooth Serial HCo6



Senzor ultrasonic HC-SR04



- 1x Șasiu platformă mobilă
- 2x motor de 3,6 V DC
- 2x anvelope din cauciuc
- 2x suport motor cu stenturi metalice L
- 1x roată omnidirecțională
- 4x Cilindru de cupru (inclusiv șuruburi și piulițe)



Fotorezistor 5528 LDR



Suport pentru senzor proximitate



LED de 5 mm

- 2 x alb
- 2x albasrtu
- 4x galben

Compartiment pentru baterii



Breadboard Mini 170 puncte x2



Fire Dupont

- mama-mama
- mama-tata



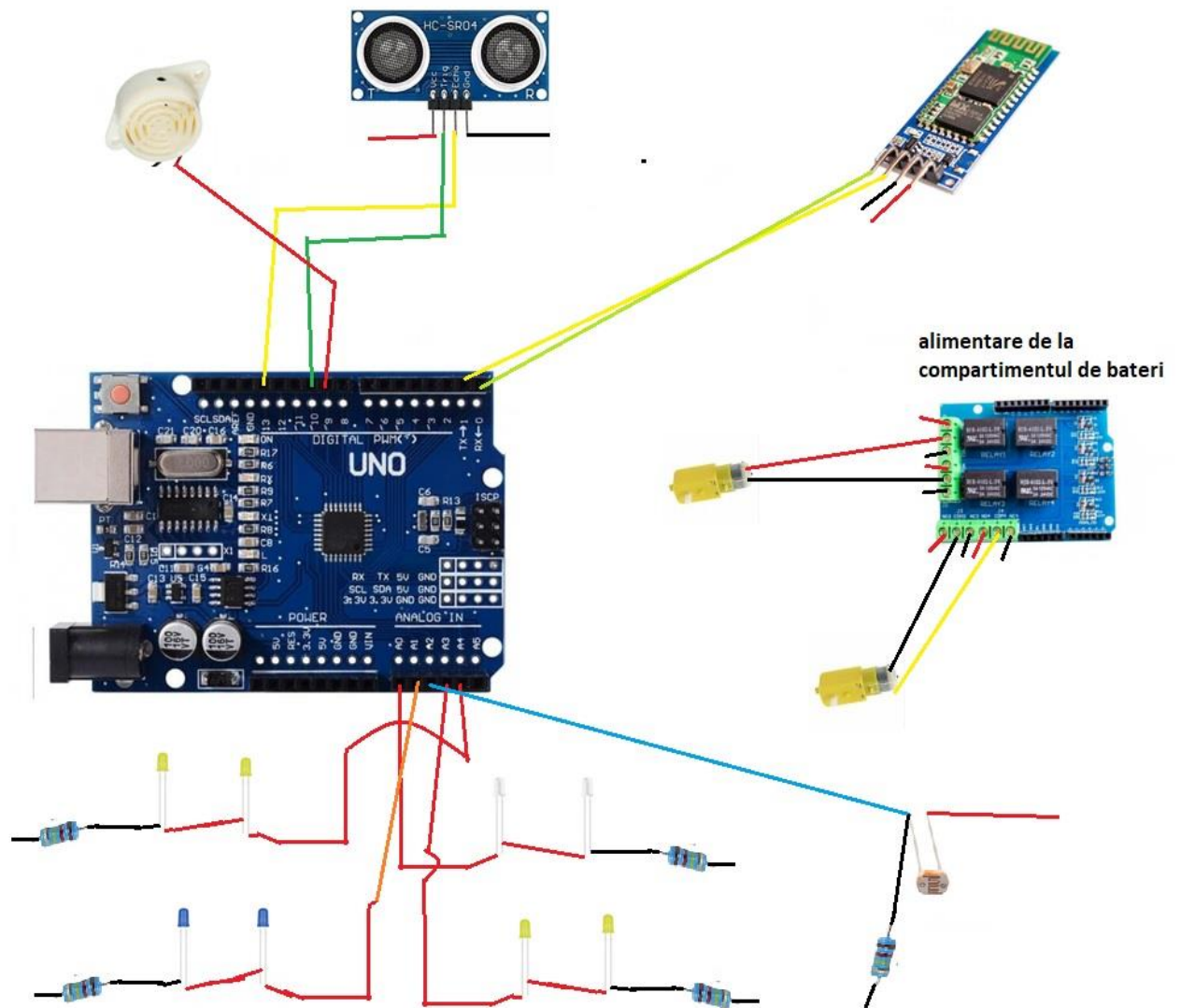
Buzzer 3-24V



Power bank 5600 mAh

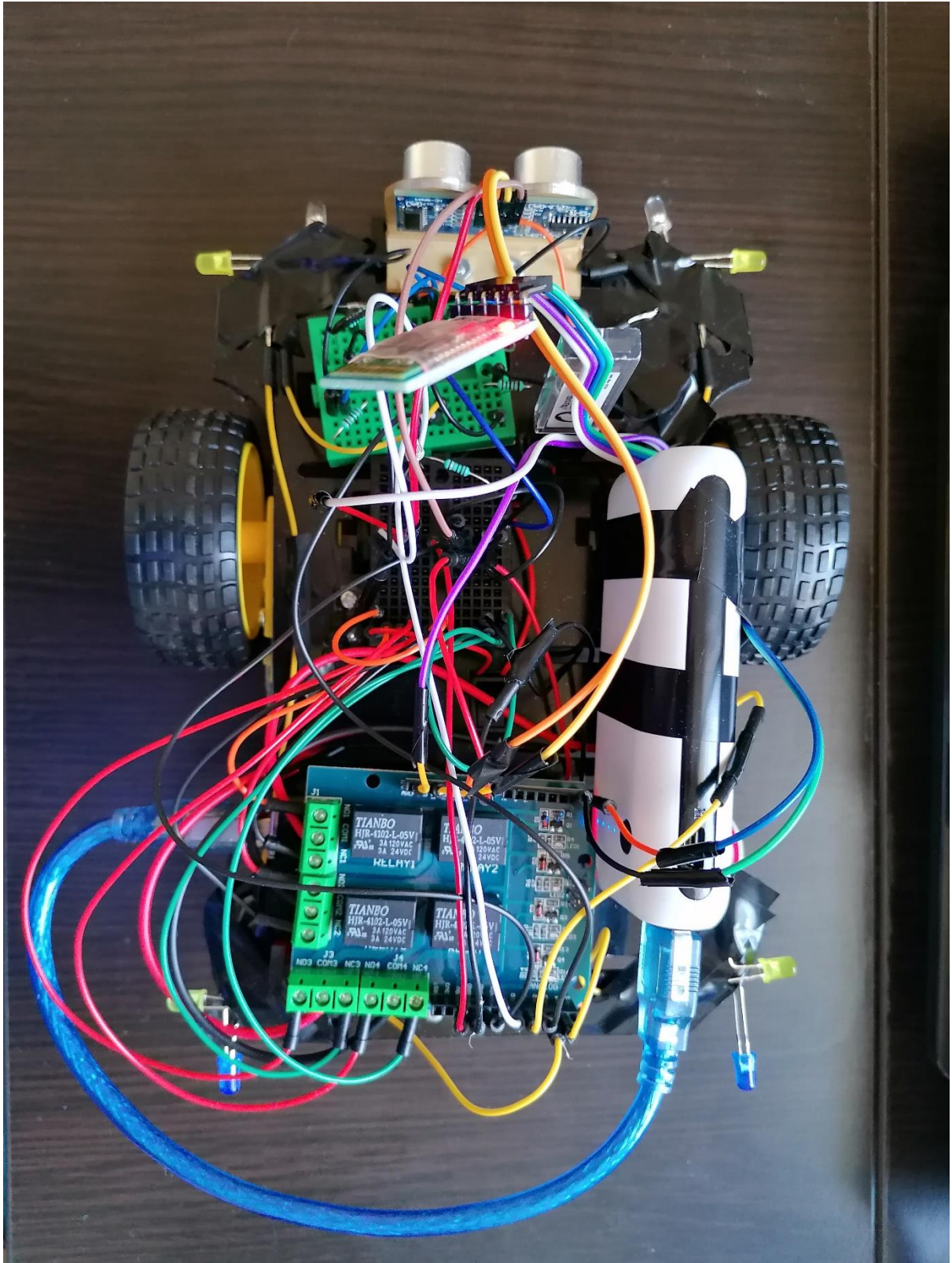


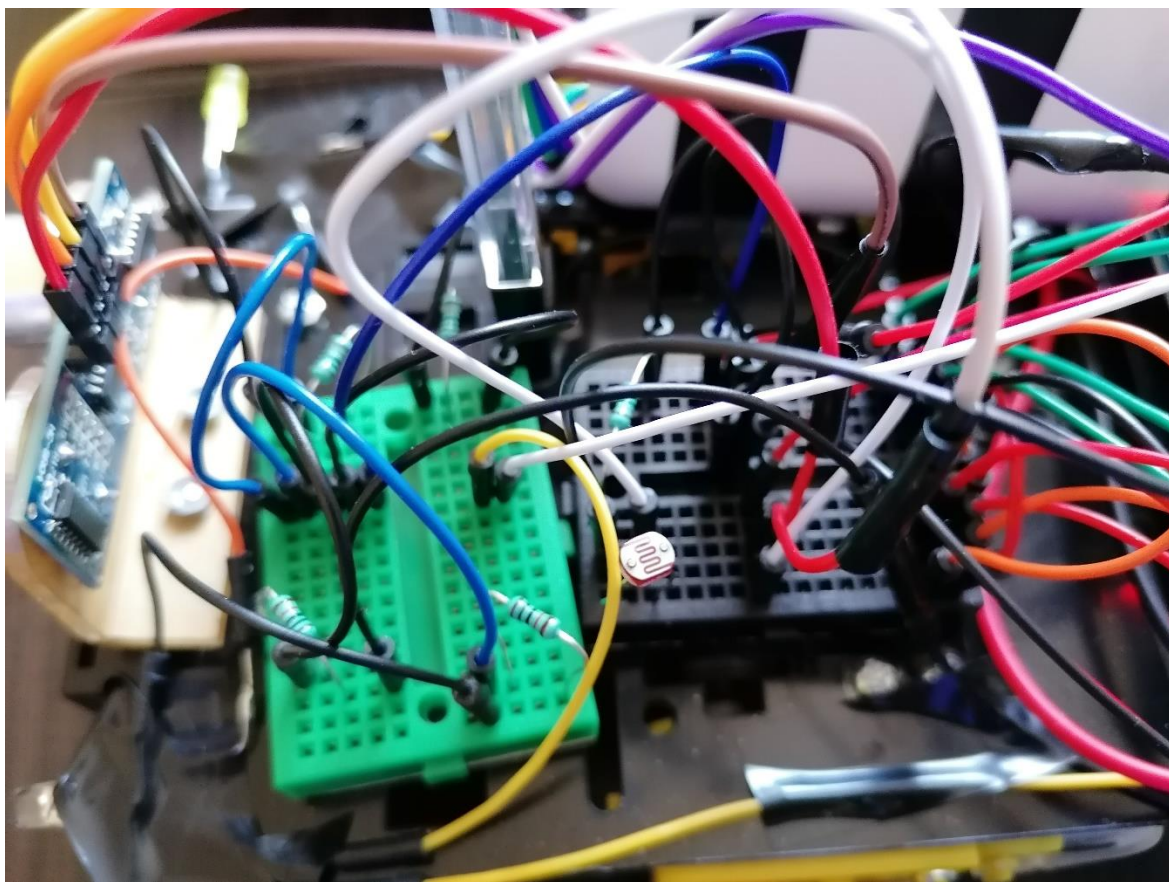
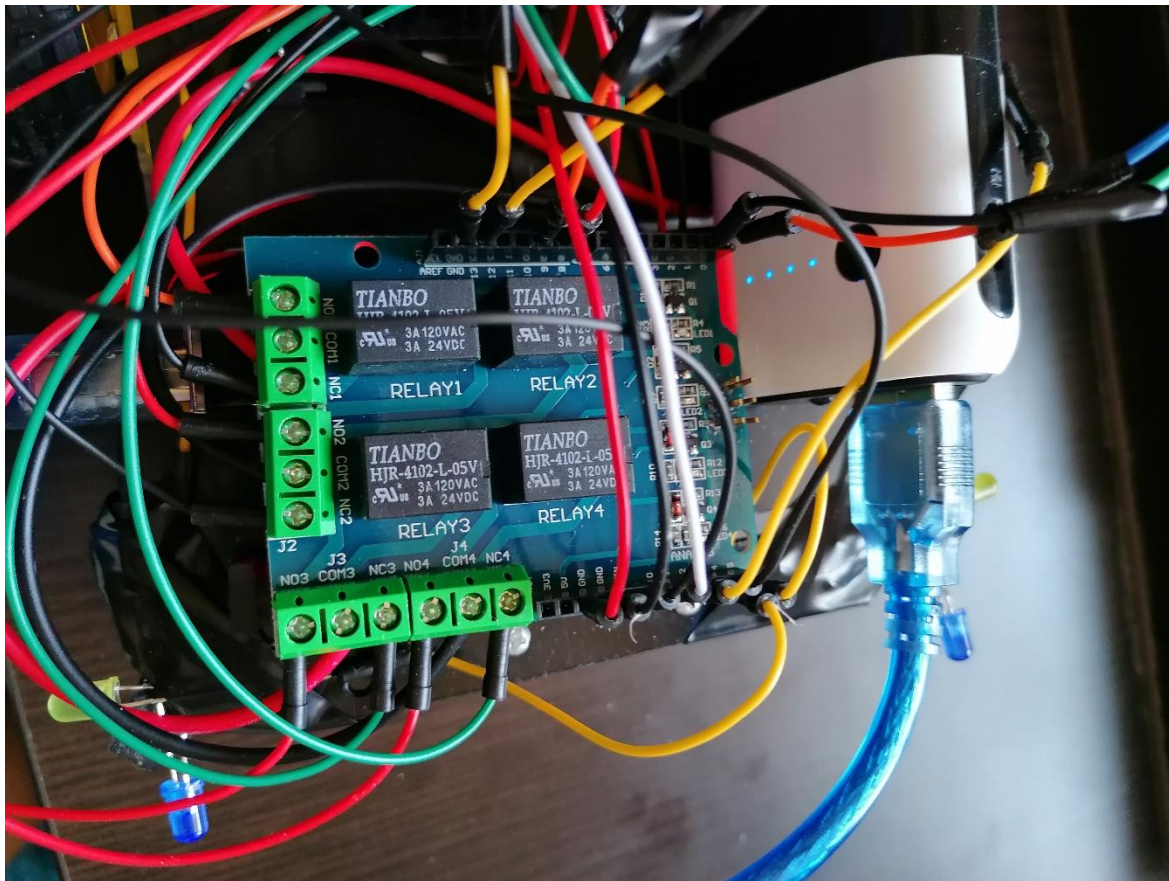
Cablu USB A-B 0.3m

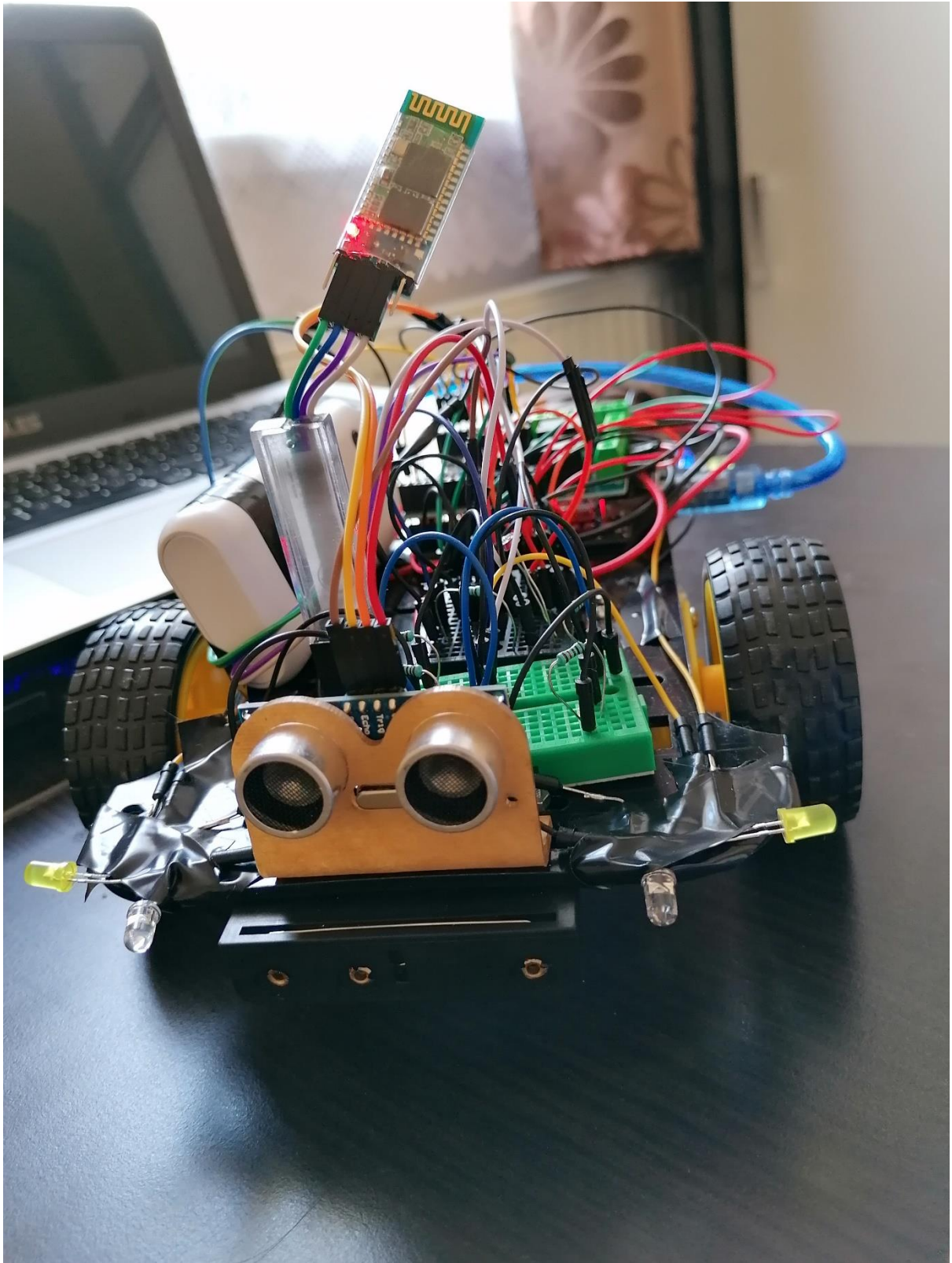


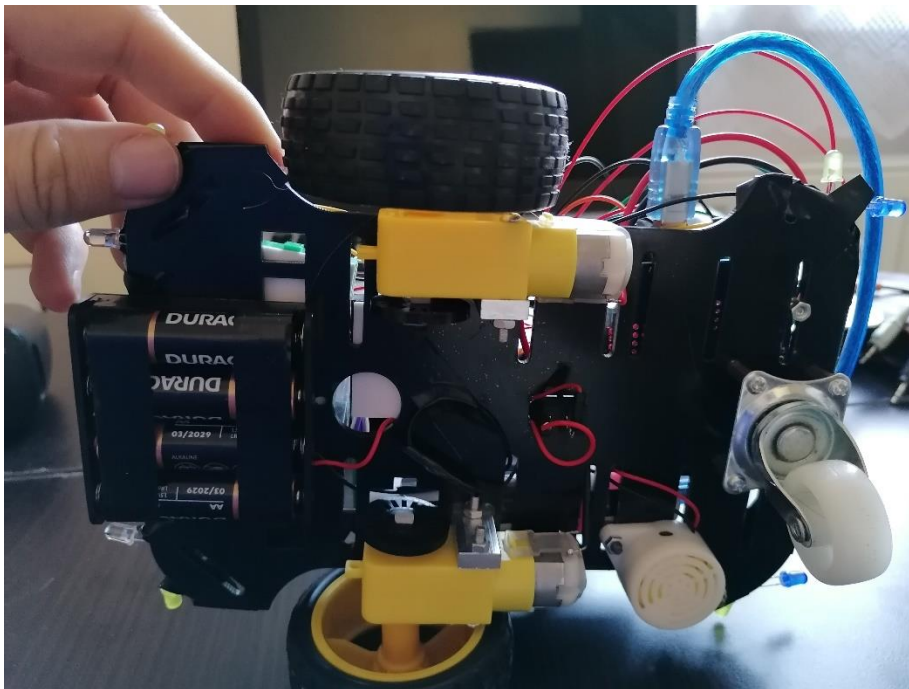
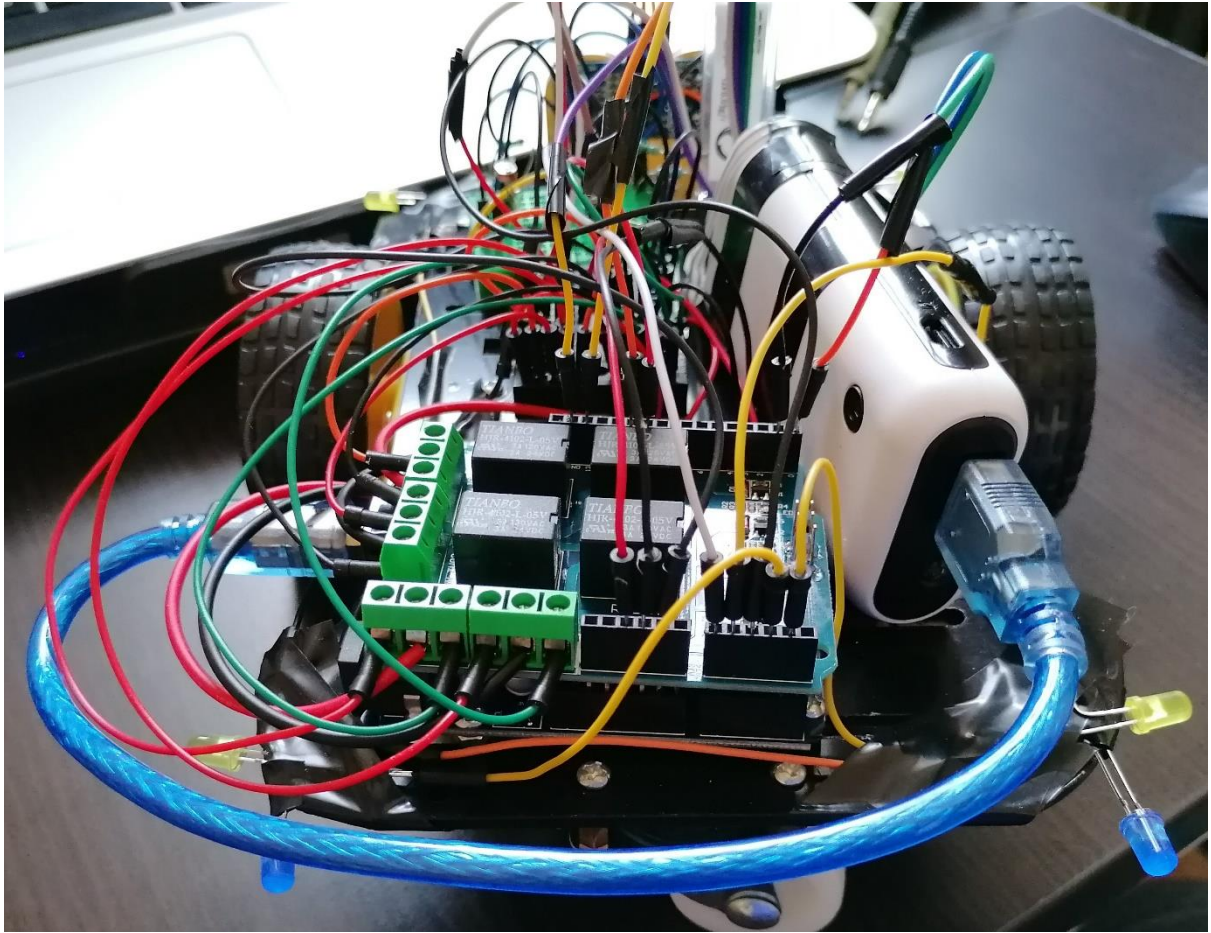
Ledurile albastre sunt stopurile.

Am folosit o placuta de expansiune cu 4 rele, folosesc 2 rele pentru fiecare motoras pentru a putea schimba sensul de rotatie al motorasului.









3. Implementare + DOC

```
#define relay1 7
```

```
#define relay2 6
```

```
#define relay3 5
```

```
#define relay4 4
```

```
#define trigPin 10
```

```
#define echoPin 13
```

```
#define buzzer 9
```

```
#define lights A0
```

```
#define tailLights A1
```

```
#define signalingRight A4
```

```
#define signalingLeft A3
```

```
bool tailLights_state = 1;
```

```
int signalingRight_state = -1;
```

```
int signalingLeft_state = -1;
```

```
float duration;
```

```
float cm = 2000;
```

```
char command;
```

```

int photocellReading;

int x;

void setup() {

    Serial.begin(9600);
    pinMode(relay1, OUTPUT);
    pinMode(relay2, OUTPUT);
    pinMode(relay3, OUTPUT);
    pinMode(relay4, OUTPUT);
    pinMode(trigPin,OUTPUT);
    pinMode(echoPin,INPUT);
    pinMode(buzzer, OUTPUT);
    pinMode(lights, OUTPUT);
    pinMode(tailLights, OUTPUT);
    pinMode(buzzer,OUTPUT);
    pinMode(signalingLeft,OUTPUT);
    pinMode(signalingRight,OUTPUT);
}

void loop() {
    if(Serial.available() > 0){
        command = Serial.read();
        switch(command){
            case 'W':
                forward();
                tailLights_state = 0;
                break;

```



```

case 'S':
    back();
    tailLights_state = 0;
    break;
case 'A':
    left();
    tailLights_state = 0;
    break;
case 'D':
    right();
    tailLights_state = 0;
    break;
case 'B':
    sstop();
    tailLights_state = 1;
    break;
case 'X':
    signalingRight_state = signalingRight_state * -1;
    break;
case 'Z':
    signalingLeft_state = signalingLeft_state * -1;
    break;
}

if(command == 'H') tone(buzzer,450);
if(command == 'J') noTone(buzzer);
}

ultrasonic();

```

```

if(command == 'W')
{
    if(cm <= 15)
    {
        sstop();
        tailLights_state = 1;
    }
}

if(tailLights_state == 1) analogWrite(tailLights, 255);
else analogWrite(tailLights, 0);

photocellReading = analogRead(A2);

//Serial.print("Analog reading = ");
//Serial.println(photocellReading);

if(photocellReading <500) analogWrite(lights, 255);
else analogWrite(lights, 0);

if(signalingRight_state == 1) analogWrite(signalingRight,x);
else analogWrite(signalingRight,0);
if(signalingLeft_state == 1) analogWrite(signalingLeft,x);
else analogWrite(signalingLeft,0);
x+=5;
if(x==255) x=0;
}

void ultrasonic()
{

```

```

digitalWrite(trigPin, LOW);
delayMicroseconds(2);
digitalWrite(trigPin, HIGH);
delayMicroseconds(5);
digitalWrite(trigPin, LOW);
duration = pulseIn(echoPin, HIGH);
cm = microsecondsToCentimeters(duration);
if(cm<=200)
{
    Serial.println(cm);
    Serial.print("    ");
}else
{
    Serial.println("Out of range    ");
}
}

float microsecondsToCentimeters(float microseconds) {
    // The speed of sound is 340 m/s or 29 microseconds per centimeter.
    // The ping travels out and back, so to find the distance of the object we
    // take half of the distance travelled.
    return microseconds / 29 / 2;
}

void forward()
{
    digitalWrite(relay1,LOW);
    digitalWrite(relay4,LOW);
    digitalWrite(relay2,HIGH);
    digitalWrite(relay3,HIGH);
}

```

```
}
```

```
void back()
```

```
{
```

```
    digitalWrite(relay1,HIGH);
```

```
    digitalWrite(relay4,HIGH);
```

```
    digitalWrite(relay2,LOW);
```

```
    digitalWrite(relay3,LOW);
```

```
}
```

```
void left()
```

```
{
```

```
    digitalWrite(relay1,LOW);
```

```
    digitalWrite(relay4,HIGH);
```

```
    digitalWrite(relay2,HIGH);
```

```
    digitalWrite(relay3,LOW);
```

```
}
```

```
void right()
```

```
{
```

```
    digitalWrite(relay1,HIGH);
```

```
    digitalWrite(relay4,LOW);
```

```
    digitalWrite(relay2,LOW);
```

```
    digitalWrite(relay3,HIGH);
```

```
}
```

```
void sstop()
```

```
{
```

```
    digitalWrite(relay1,LOW);
```

```
    digitalWrite(relay3,LOW);
```




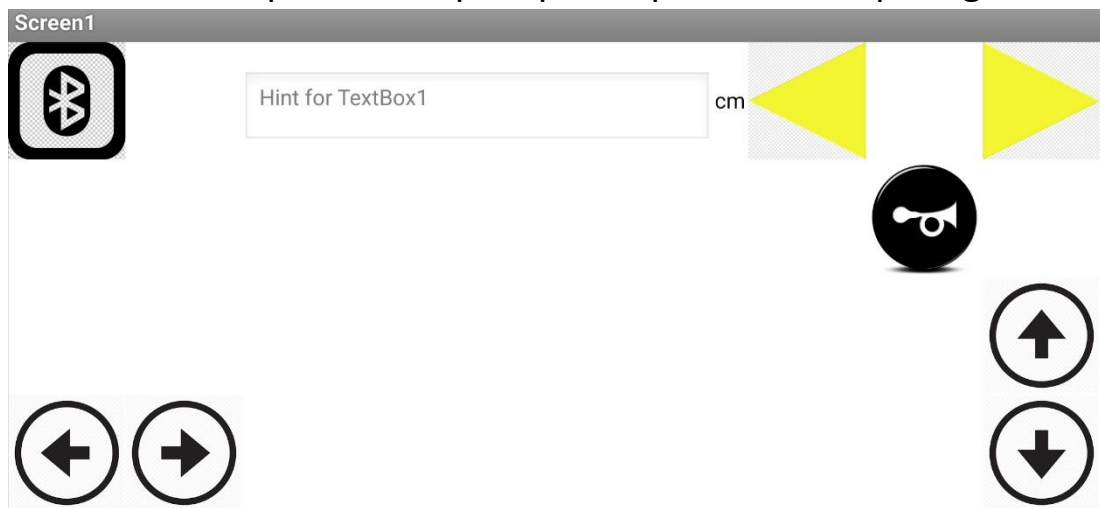
```
digitalWrite(relay2,LOW);  
digitalWrite(relay4,LOW);  
}
```

4. Cum se utilizeaza?

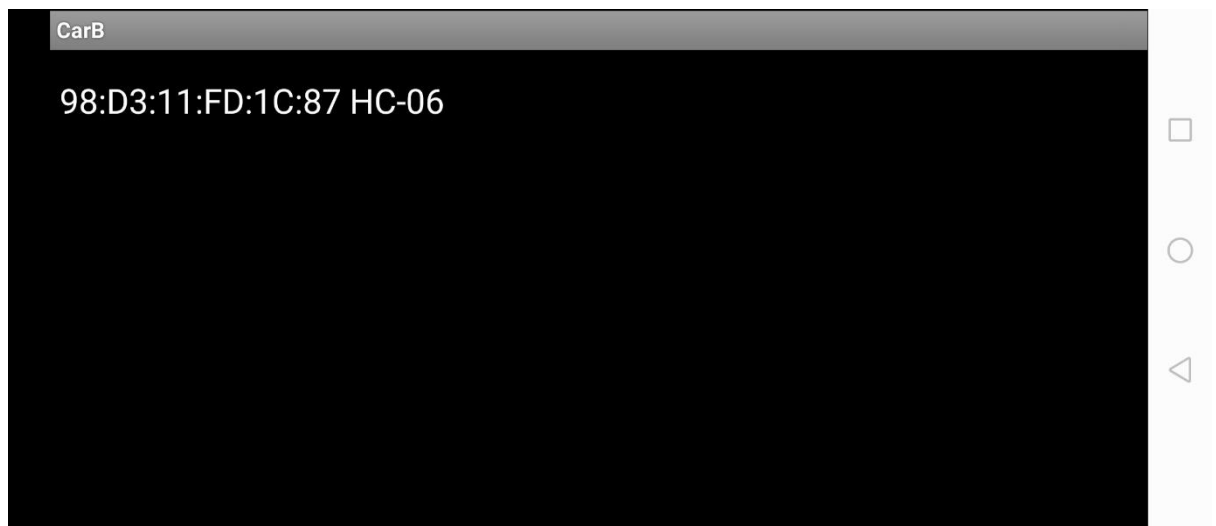
Descarcati si instalati aplicaia pe telefon :

<https://drive.google.com/file/d/1siK6I11DBMqHCFTQZcFHowHQOZj5MbFT/view?usp=sharing>

1. Activati bluetooth de pe telefon.
2. Conectati-va la modulul bluetooth al masinutei. Alegeti din lista de dispozitive bluetooth HC-06 si introduceti parola 1234.
3. Deschideti aplicatia si apoi apasati pe iconita cu pictograma 

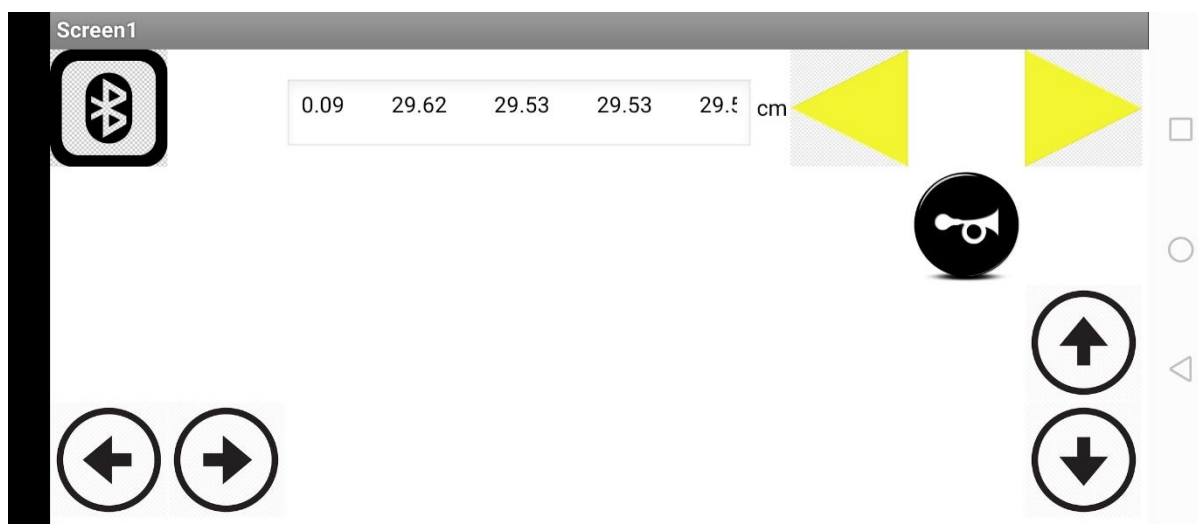


2. Alegeti din lista adresa bluetooth corespunzatoare masinutei (bluetoothul trebuie sa fie activat):



3. Dacă ledul roșu de pe modulul bluetooth nu mai palpaie, aplicația s-a conectat cu succes.

4. Acum puteți să controlați mașinuta, stanga, dreapta, înainte, înapoi, de asemenea puteți să claxonati și să semnalizați.



Puteți să observați distanța citită de senzorul cu ultrasunete.