

2019

Arduino

PROJECT 2
BRIAN NANNAYAKKARA

Appendix

Projects	2
Project 1	2
Project 1-2 description:.....	2
Project 3	2
Project 3 description:.....	2
Project Traffic Light.....	2
Project Traffic Light description:	2
Time schedule	3
Sources.....	3
Appendix.....	4
Wiring1	4
Code1.....	5
Wiring3	6
Code3.....	7
Wiring Traffic.....	8
Code Traffic	9

Projects

Project 1

The practice project 1 and 2 are combined

First part is making the circuit and the second part is coding

Wiring: Look at the picture on the Appendix wiring1

Coding: Look at the picture on the Appendix Code1

Project 1-2 description:

The 3 LEDs will change flashing moods when pressing the button

Project 3

Project 3 description:

This project can recognize the heat and give feedback through LEDs

Wiring: Look at the picture on the Appendix wiring3

Coding: Look at the picture on the Appendix Code3

Project Traffic Light

Project Traffic Light description:

This project is about traffic lights in the road, it's a simple version of the real life traffic lights. There are 3 LEDs (red, yellow, green) the program starts with red light and then after a while the yellow LED will turn on and then the green LED (only one LED at a time will be on) and after a while the green LED will start blinking, and that means it about to be red again.

Wiring: Look at the picture on the Appendix wiring Traffic

Coding: Look at the picture on the Appendix Code Traffic

Project MoveOnBlack

Project MoveOnBlack description:

This project is about moving a emoro 2560 robot on a black line and make it avoid hitting obstacles.

Wiring: Look at the picture on the Appendix wiring MoveOnBlack

Coding: Look at the picture on the Appendix Code MoveOnBlack

Time schedule

28-01-2019: Checked out all the source videos and read about Arduino

29-01-2019: Start making the first project by following instructions in the book

30-01 – 04-02: work with the other projects for get better experience in C++ programing

04-02-2019: made the traffic light project

05-02 – 11-02: work with the EMORO 2560

Sources

Top 10 Arduino Projects: <https://www.youtube.com/watch?v=eJg3yuAAawA>

Arduino website: <https://www.arduino.cc/en/Tutorial/Blink>

You can learn Arduino in 10 min: <https://www.youtube.com/watch?v=nL34zDTPkcs>

Udemy learn Arduino: <https://www.udemy.com/arduino-workshop-step-by-step-guide/>

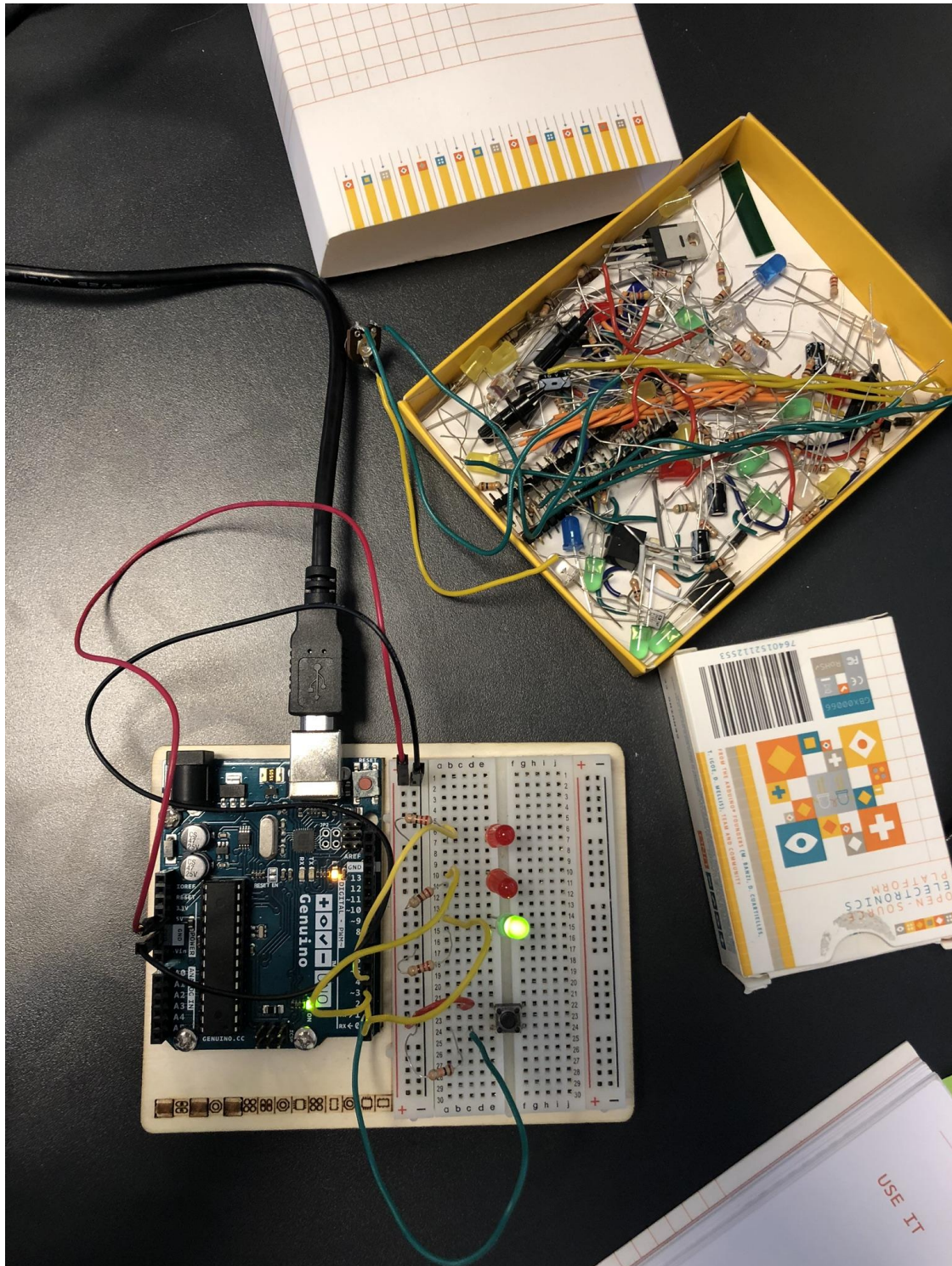
Intro til Microcontroller: <https://www.youtube.com/watch?v=dxVh8B4f2eE>

Amazon Robots!: <https://www.youtube.com/watch?v=iOfEiw4ycyY>

EMoRo 2560: <https://www.arduinolibraries.info/libraries/e-mo-ro-2560>

Appendix

Wiring1



Code1

```
int switchState = 0;

void setup() {
    // put your setup code here, to run once:
    pinMode(3, OUTPUT);
    pinMode(4, OUTPUT);
    pinMode(5, OUTPUT);
    pinMode(2, INPUT);
}

void loop() {
    // put your main code here, to run repeatedly:
    switchState = digitalRead(2);

    if ( switchState == LOW) // the button is not pressed
    {
        digitalWrite(3, HIGH);
        digitalWrite(4, LOW);
        digitalWrite(5, LOW);
    }

    else{// button is pressed

        digitalWrite(3, LOW);
        digitalWrite(4, LOW);
        digitalWrite(5, HIGH);

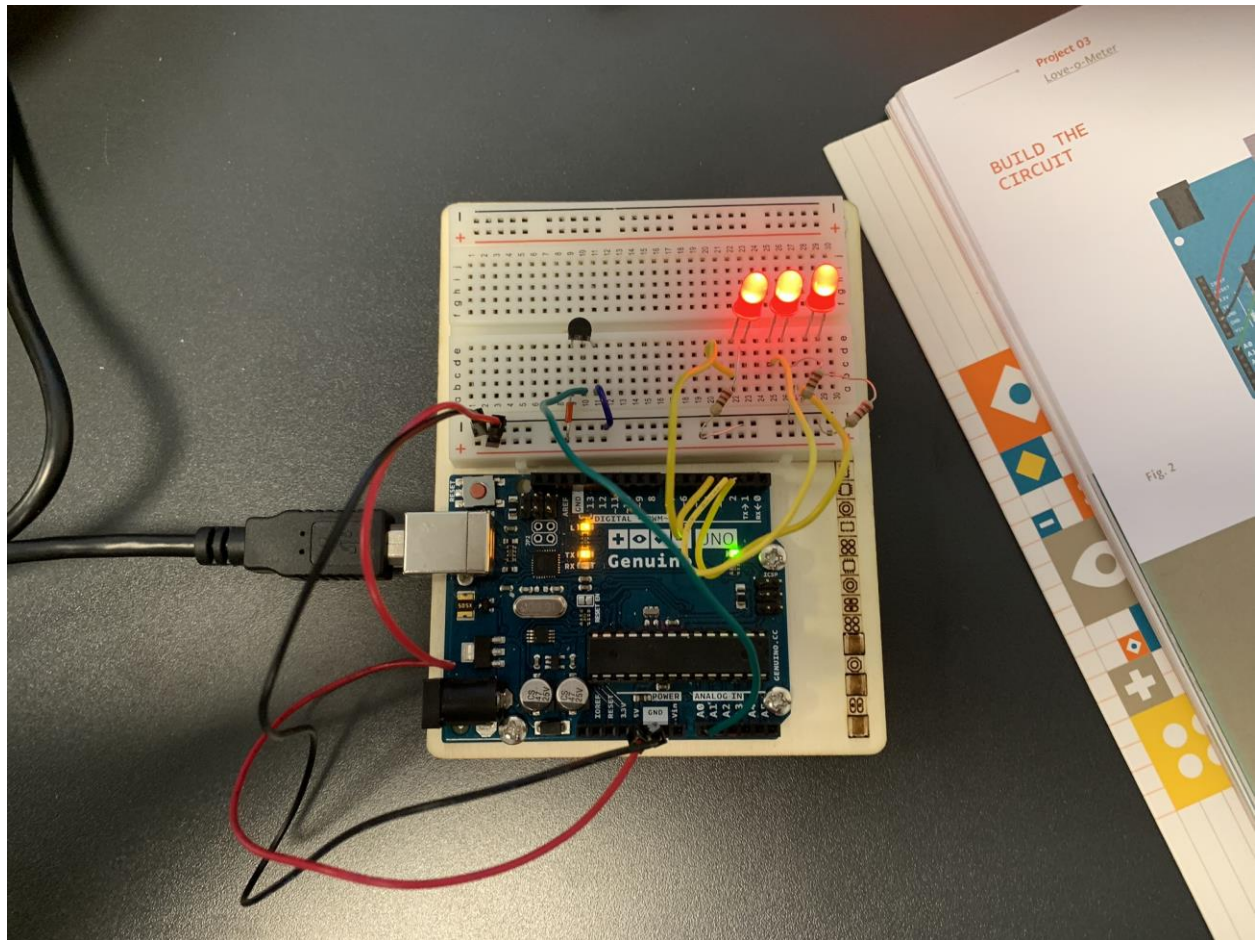
        delay(250);
        digitalWrite(4, HIGH);
        digitalWrite(5, LOW);
        delay(250);

    }

}
```

• Rectangular Snip

Wiring3



Code3

```
const int sensorPin =A0;
const float baselineTemp = 20.0;

void setup() {
  // put your setup code here, to run once:
  Serial.begin(9600); // open serial port

  for(int pinNumber = 2; pinNumber<5; pinNumber++)
  {
    pinMode(pinNumber, OUTPUT);
    digitalWrite(pinNumber, LOW);
  }
}

void loop() {
  // put your main code here, to run repeatedly:
  int sensorVal = analogRead(sensorPin);

  Serial.print("Sensor Value");
  Serial.print(sensorVal);

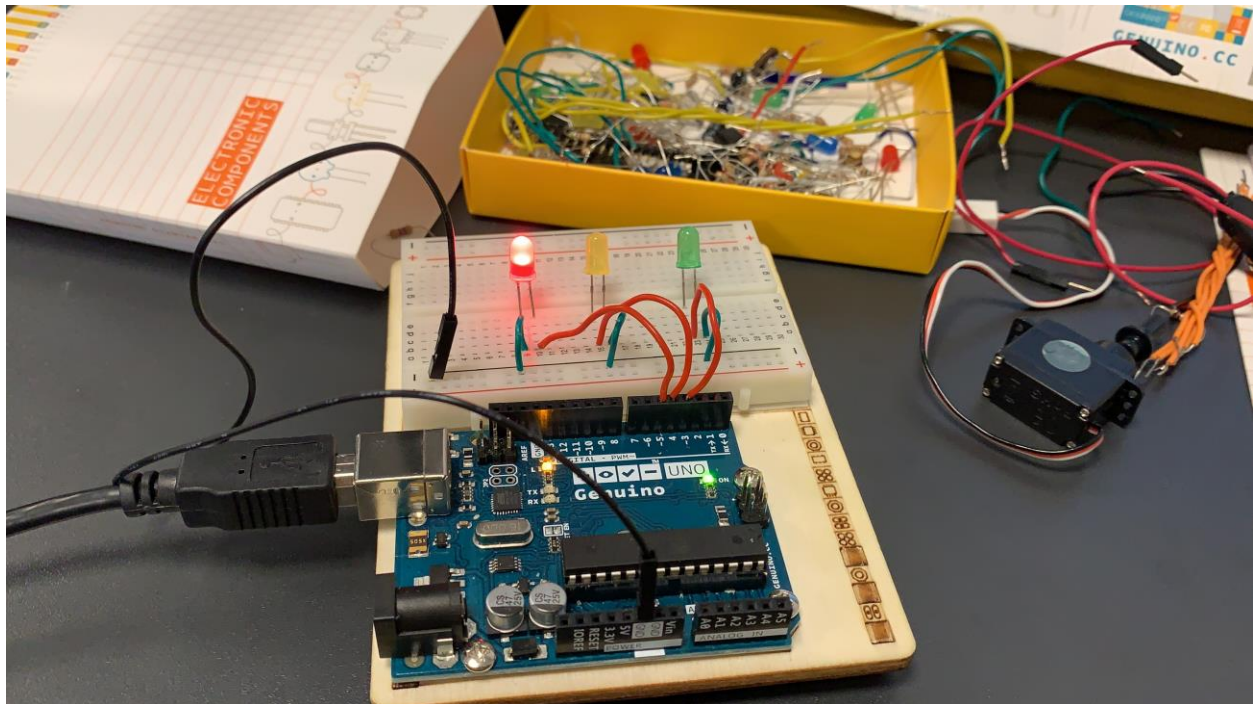
  float voltage = (sensorVal/1024.0)* 5.0;
  Serial.print(", Volts: ");
  Serial.print(voltage);

  Serial.print(", degrees C: ");
  float temperature =(voltage - .5) * 100;
  Serial.print(temperature);

  if(temperature < baselineTemp+2)
  {
    digitalWrite(2, LOW);
    digitalWrite(3, LOW);
    digitalWrite(4, LOW);
  }else if(temperature >= baselineTemp+2 && temperature < baselineTemp+4)
  {
    digitalWrite(2, HIGH);
    digitalWrite(3, HIGH);
    digitalWrite(4, LOW);
  }else if (temperature >= baselineTemp+6)
  {
    digitalWrite(2, HIGH);
    digitalWrite(3, HIGH);
    digitalWrite(4, HIGH);
  }

  delay(1);
}
```

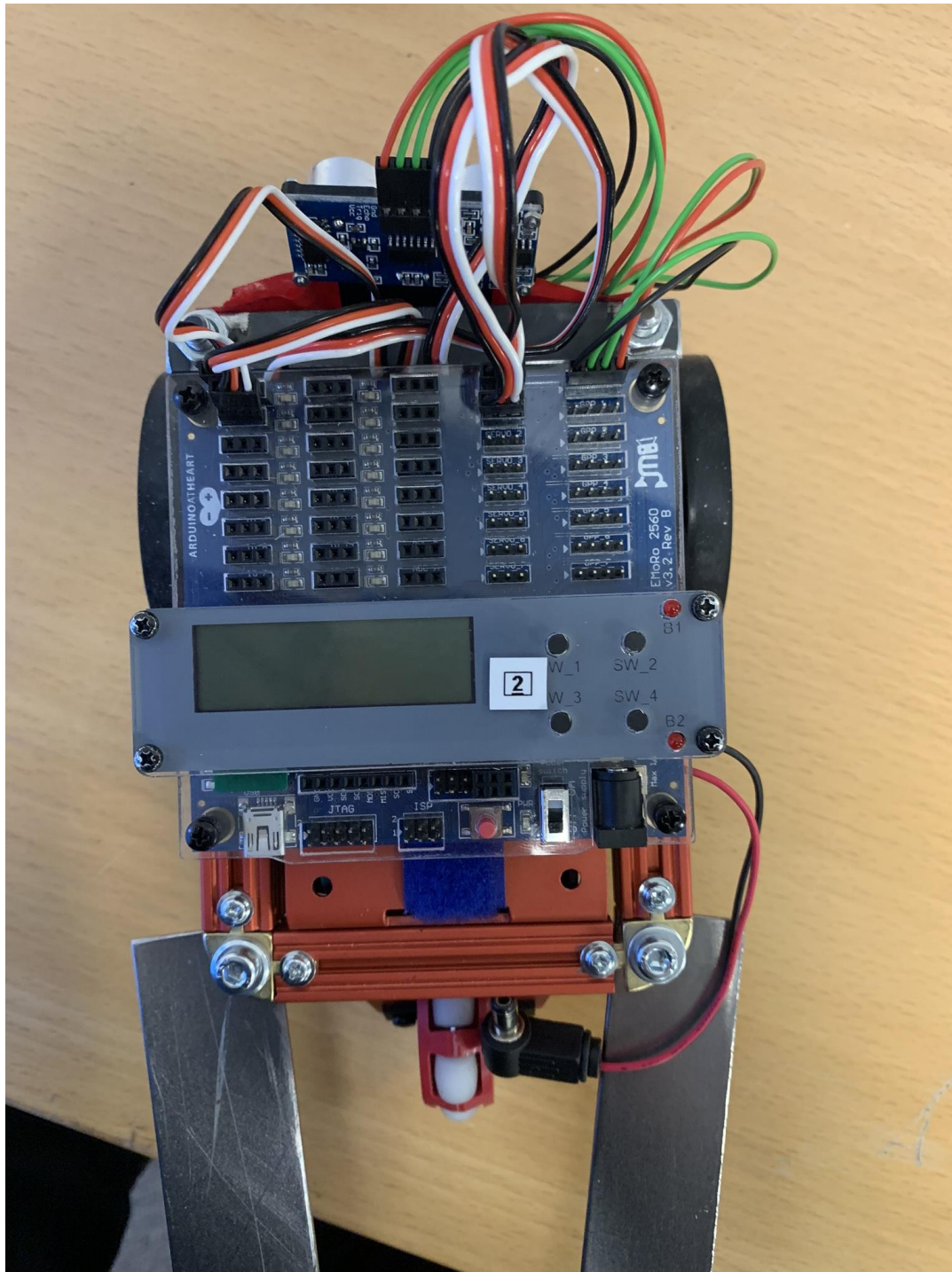

Wiring Traffic

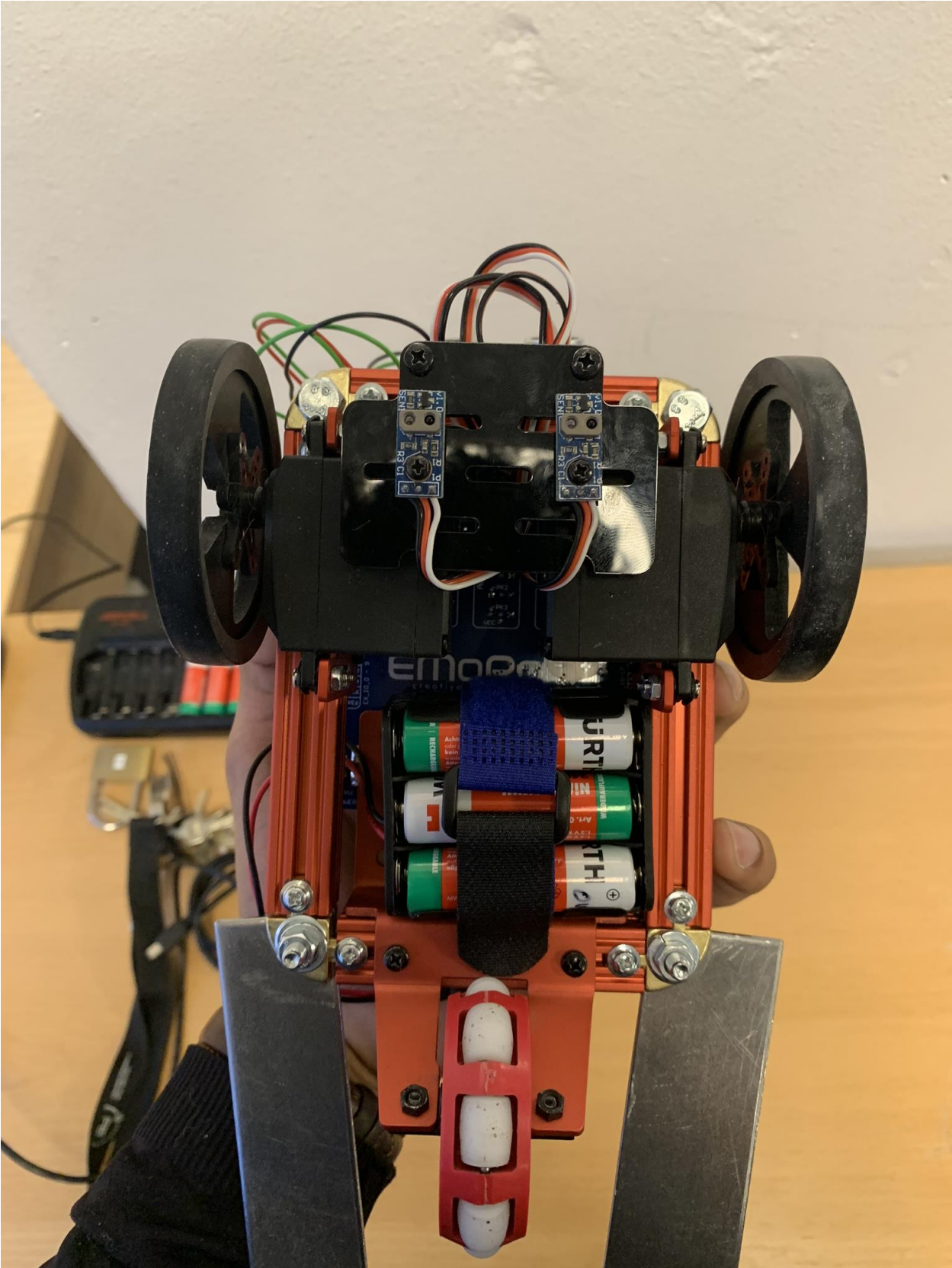


Code Traffic

Wiring MoveOnBlack

I did not have to wire the robot because it was already made but I had to learn the wiring in order to work with the robot





Code MoveOnBlack

```
static int LB = 1000;
static int RB = 2000;

static int LF = 2000; // right
static int RF = 1000; // left

static int LStop = 1500;
static int RStop = 1500;

void setup() {
    // put your setup code here, to run once:
    InitEmoro();
    EmoroServo.attach(SERVO_0);
    EmoroServo.attach(SERVO_1);
    Ultrasonic.attach(GPP_0);

    Serial.begin(9600);
    Serial.println("Example: IR + servo");

    pinMode(IO_0, INPUT_PULLUP); // Right
    pinMode(IO_1, INPUT_PULLUP); // left
    pinMode(GPP_0, INPUT_PULLUP);
```

```

void loop() {
    // put your main code here, to run repeatedly:

    // 1 == white && 0 == black

    Serial.println(Ultrasonic.read(GPP_0));

    if (Ultrasonic.read(GPP_0) > 1 && Ultrasonic.read(GPP_0) < 20)

    {
        // turn Right
        EmoroServo.write(SERVO_0, LStop);
        EmoroServo.write(SERVO_1, RF);
        delay(750);

        // go forward
        EmoroServo.write(SERVO_0, LF);
        EmoroServo.write(SERVO_1, RF);
        delay(1000);

        // turn Left
        EmoroServo.write(SERVO_0, RB);
        EmoroServo.write(SERVO_1, LF);
        delay(450);

        // go forward
        EmoroServo.write(SERVO_0, LF);
        EmoroServo.write(SERVO_1, RF);
        delay(2000);

        // turn Left
        EmoroServo.write(SERVO_0, RB);
        EmoroServo.write(SERVO_1, LF);
        delay(450);
    }
}

```



```

// go forward
EmoroServo.write(SERVO_0, LF);
EmoroServo.write(SERVO_1, RF);
delay(1000);

// turn Right
EmoroServo.write(SERVO_0, LStop);
EmoroServo.write(SERVO_1, RF);
delay(750);

/*// tuen right
EmoroServo.write(SERVO_0, LF);
EmoroServo.write(SERVO_1, RStop);
delay(500);

// go forward
EmoroServo.write(SERVO_0, LF);
EmoroServo.write(SERVO_1, RF);
delay(500);*/

}

else if (digitalRead(IO_0) == 1 && digitalRead(IO_1) == 1)
{
EmoroServo.write(SERVO_0, LF);
EmoroServo.write(SERVO_1, RF);
}

else if (digitalRead(IO_0) == 0 && digitalRead(IO_1) == 0)
{
EmoroServo.write(SERVO_0, LStop);
EmoroServo.write(SERVO_1, RStop);
}

```

```
else if (digitalRead(IO_0) == 1 && digitalRead(IO_1) == 1)
{
  EmoroServo.write(SERVO_0, LF);
  EmoroServo.write(SERVO_1, RF);
}

else if (digitalRead(IO_0) == 0 && digitalRead(IO_1) == 0)
{
  EmoroServo.write(SERVO_0, LStop);
  EmoroServo.write(SERVO_1, RStop);
}

else if (digitalRead(IO_0) == 0 && digitalRead(IO_1) == 1)
{
  EmoroServo.write(SERVO_0, LF);
  EmoroServo.write(SERVO_1, RStop);
}

else if (digitalRead(IO_1) == 0 && digitalRead(IO_0) == 1)
{
  EmoroServo.write(SERVO_0, LStop);
  EmoroServo.write(SERVO_1, RF);
}

}
```
