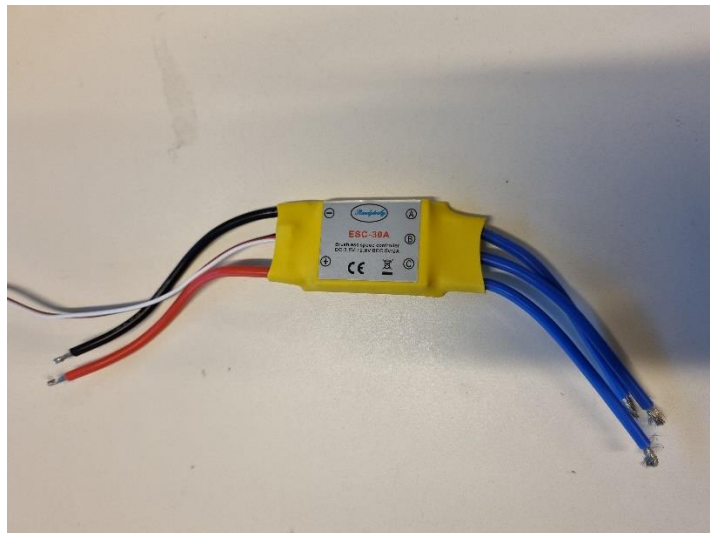# Report of the third session

In the third session of building our autonomous RC car, I did the following tasks:

- The ESC modules that came with the brushless motors were unidirectional so we had to order two new ESC modules that are bidirectional and can make our autonomous car go forward and backward.

- My colleague and I conceived the base of our car and succeeded to laser cut it, but this first try isn't the final design of the lower frame. The frame is made of wood with a 3mm of thickness, and it will help us know where to put each component of the car and do some measurements to have a very steady and well-balanced car.
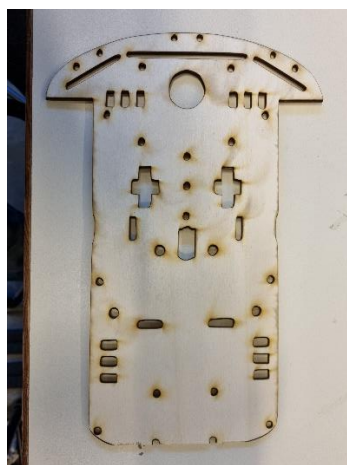
- I browsed the internet searching for the code to control the HC-SR04 sensor with the ESP32-WROOM board that was handed out to us in the last session. The code that I ended up using was working very well, just like with the ARDUINO UNO R3 card. The code is:

```
const int trigPin = 5;
const int echoPin = 18;

//define sound speed in cm/uS
#define SOUND_SPEED 0.034
#define CM_TO_INCH 0.393701

long duration;
float distanceCm;
float distanceInch;

void setup() {
  Serial.begin(115200); // Starts the serial communication with the ESP32 module
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input
}

void loop() {
  // Clears the trigPin
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  // Sets the trigPin on HIGH state for 10 micro seconds
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration = pulseIn(echoPin, HIGH);

  // Calculate the distance
  distanceCm = duration * SOUND_SPEED/2;

  // Convert to inches
  distanceInch = distanceCm * CM_TO_INCH;

  // Prints the distance in the Serial Monitor
  Serial.print("Distance (cm): ");
  Serial.println(distanceCm);
  Serial.print("Distance (inch): ");
  Serial.println(distanceInch);
```

```
  delay(1000);
}
```

I also looked online for the ARDUINO code to run the laser ranging sensor that our supervisor gave us last time in order to run it with the ESP32-WROOM board. I failed to get the laser to work, each time I tried a code that I had grabbed from the internet, the only reading that I get, even when changing the distance between the sensor and the obstacle, is 65715mm. Thus, I was obliged to leave it there because the time was up, but I will certainly find a solution for it when I go back home.

- Finally, our supervisor gave us an MPU-6050 accelerometer gyroscope that will help us know the degrees of tilt of our car and also calculate its acceleration. The module looks like this, and is very tiny which is beneficial for our project: