

Session 2

Our choice of chassis is finally fixed, we start on the tracks (no reference) actually available in the classroom, which we started to partially disassemble.

The platform below the DC engines that will be recovered at this time has been removed and the shell will be reshaped.

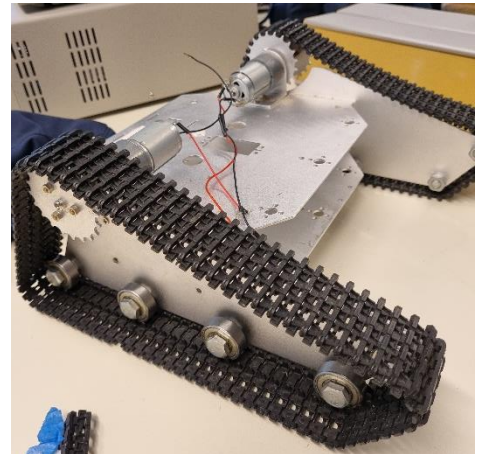


Fig 1 : track

The **Capturer Distance class** of the HC-SR04 Ultrasound sensor has been finalized and is functional, the trigger and echo data will be deprived and the **CapturerDistance function** and function will be called during the next program for calculating the distance between the edge and an obstacle.

The Class will be also called during the mapping, with a control structure (if.... else) and safety distances, so the robot can turn replace itself.

Our DC motors currently do not have encoders capable of generating the information needed to measure displacement.

We will first use a GY-521 accelerometer (which can also be used as a temperature detector) to detect the movement and position of our robot in real time.

Correction values will be added to the program to allow calculation of values even when the component is at rest "Our two components have a consumption of 5 μ A at rest".

The 3 axes will be used for 3D positioning.

```

void setup() {
  // put your setup code here, to run once:
  Wire.begin();
  Wire.beginTransmission(MPU_addr);
  Wire.write(0x6B);
  Wire.write(0);
  Wire.endTransmission(false);
  Wire.requestFrom(0x68, 6, true);
  Serial.begin(9600);
}

void loop() {
  // put your main code here, to run repeatedly:
  Wire.beginTransmission(0x68);
  Wire.write(0x1c);
  Wire.write(B00000000);
  Wire.endTransmission();

  acc_X=(Wire.read()<<8|Wire.read())/16384 + corr;
  acc_Y=(Wire.read()<<8|Wire.read())/16384 + corr;
  acc_Z=(Wire.read()<<8|Wire.read())/16384+ corr;
  angle_x = (atan((acc_X) / sqrt(pow((acc_Y),2) + pow((acc_Z),2))) *57.296 );
  angle_y = (atan((acc_Y) / sqrt(pow((acc_X),2) + pow((acc_Z),2))) * 57.296);

  Serial.println(angle_x, angle_y);
}

```

Fig 2: accelerometer code

Our scheduled class does not contain any interruptions at this time, they will be added as we go along.

The program is working pretty well, a negative angle appeared when the component is looking down and a positive one otherwise.

Summary table: main characteristics of the components currently in use

Component	Power	Number of Pin used	Storage space used
HC-SR04 (ultrasound)	5 V	2 + ground/5V	6% ⇔ 1957 octets
		Pin 8 + pin 9	
GY-521 (accelerometer)	5V	2 + ground/4V	20% ⇔ 6522 octets
		Pin A4 + pin A5	

For now we still have enough space on our Arduino card with no timer that comes into conflict.