Robotic Arm

Douinaud Ilian
Mengelatte Guillaume
Mezailles Vincent
Visine Brendan

Goal of the project

How to manipulate dangerour substances safely?

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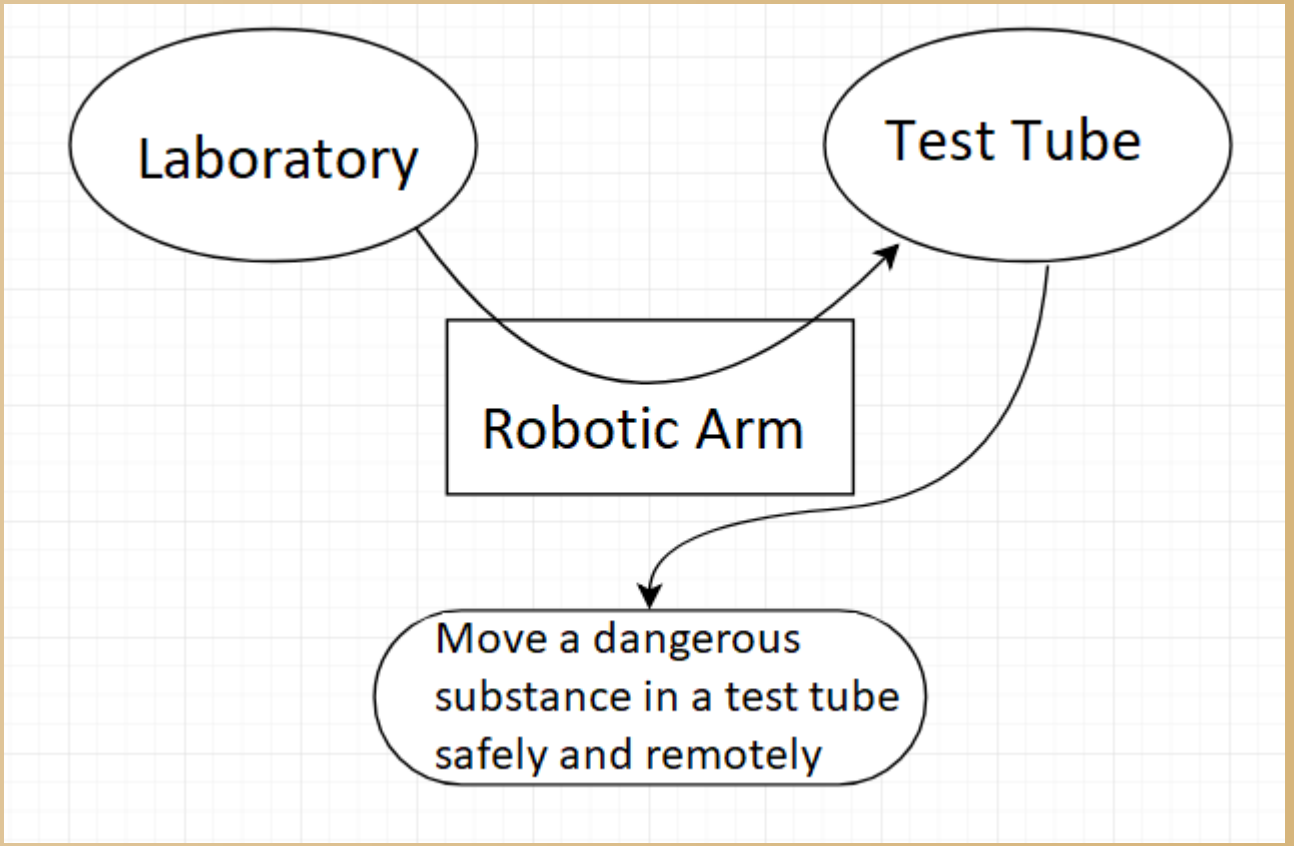
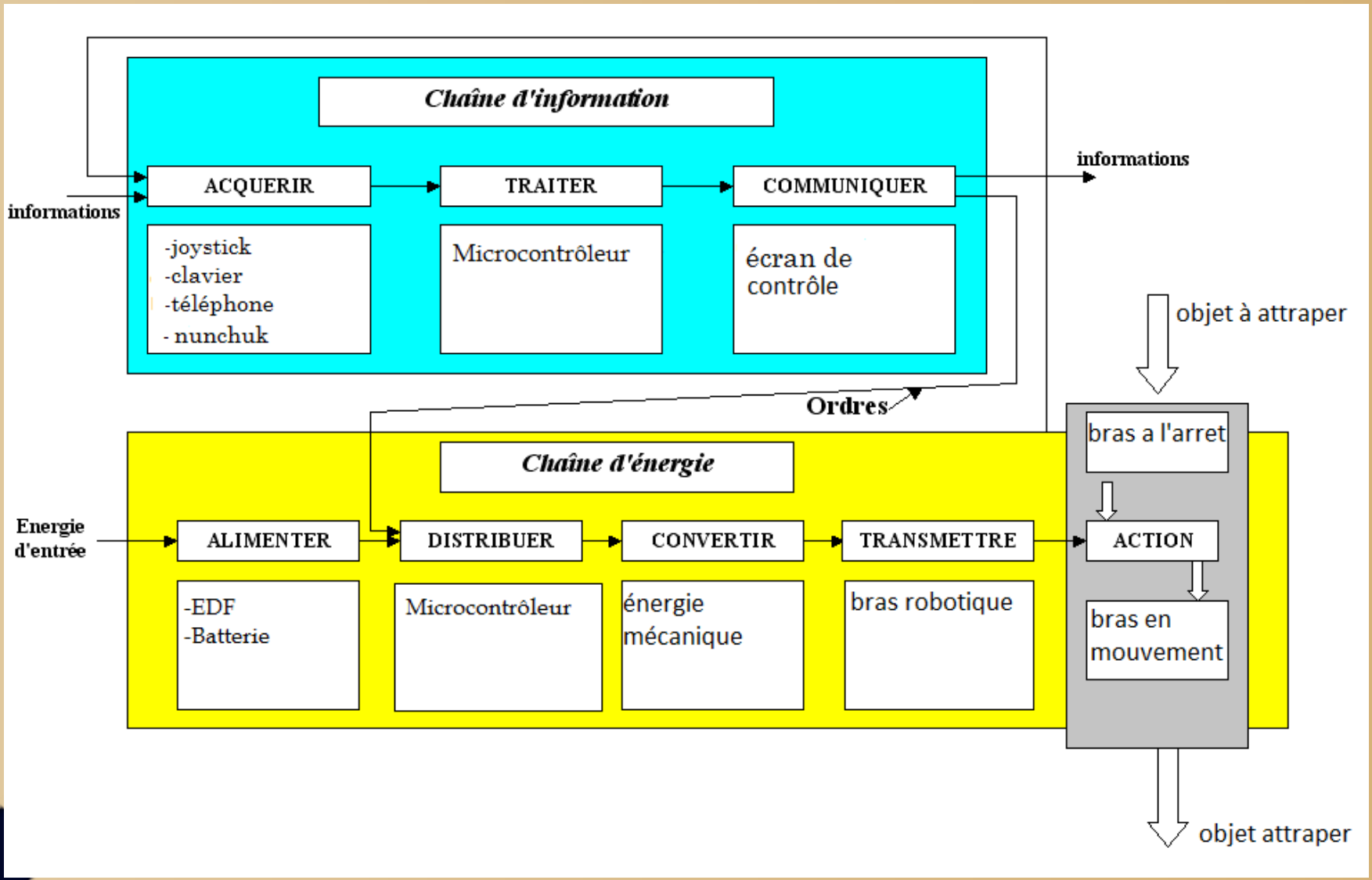
I/Common Part

a)Needs Analysis



I/Common Part

b)Information/Energy Chain

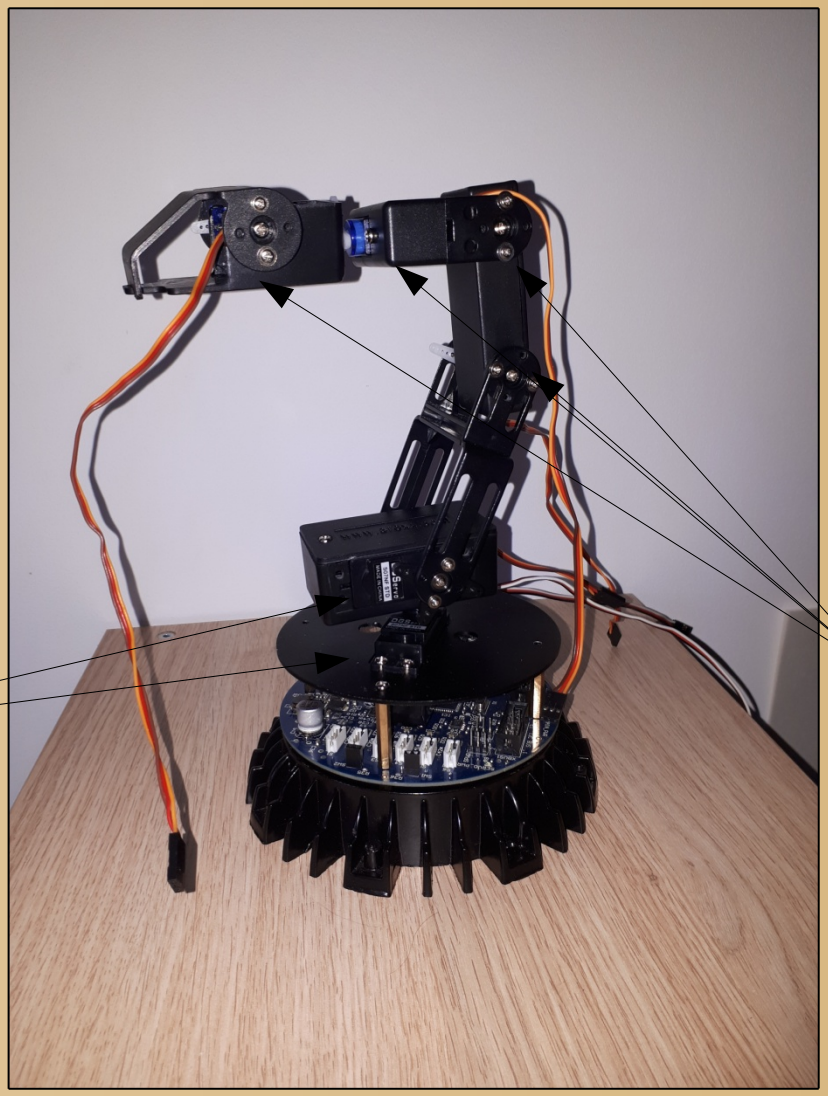


I/Common Part

c)Sustainable Development

I/Common Part

d)Robotic Arm



2x Servomotors

4x Servomotors

II/Personal Task

a) Components choice

Servo motors:

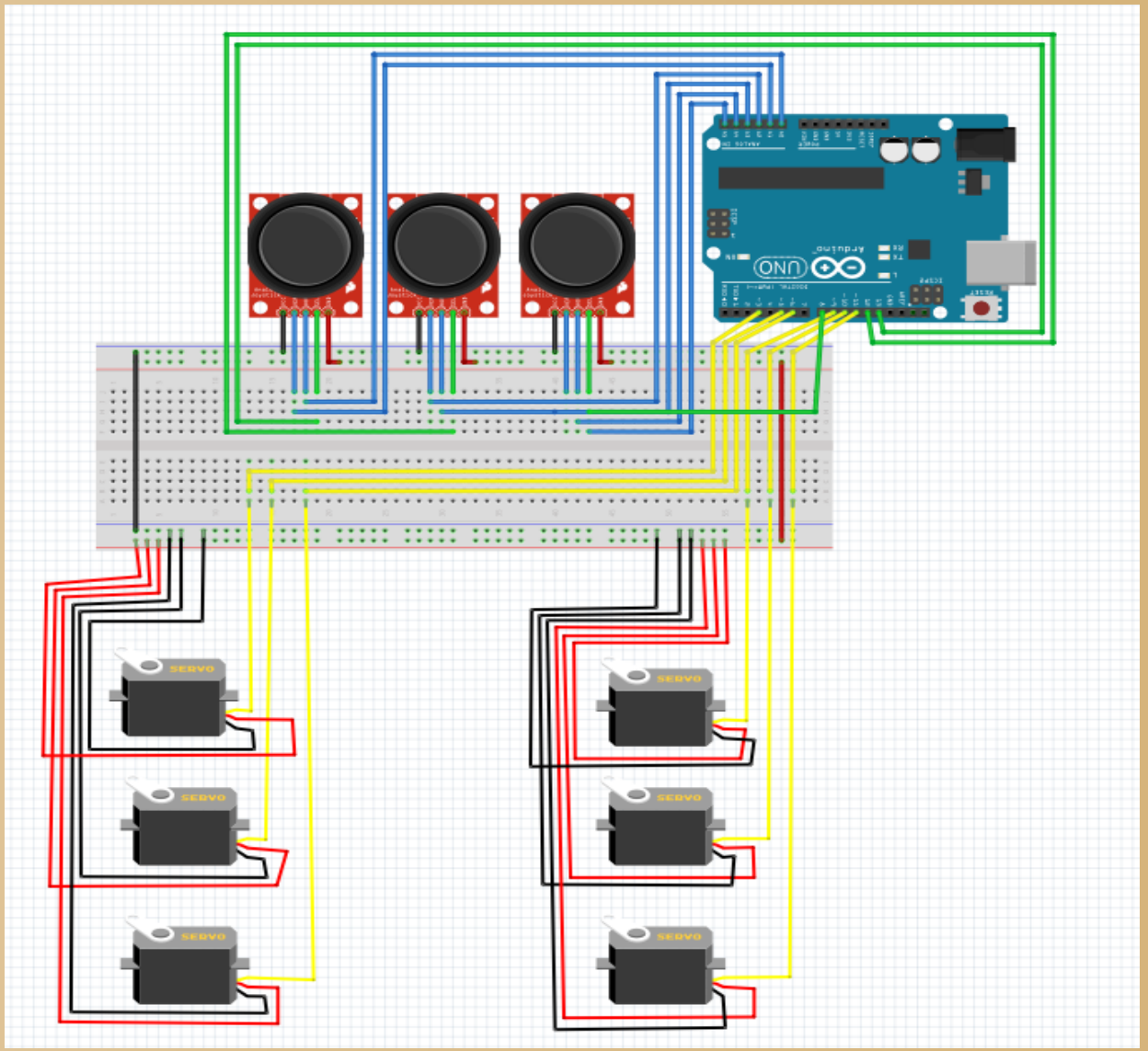
SG90	S07NF
x4	x2
9g	38g
4.8 V	4.8-6 V
1.6 N.m	5.5 N.m
180°	180°
0.15 sec/90°	0,18 sec/60°

Joysticks:

Joystick Module
x3
0-5V
5 pin
Value : 0 -1023
Median Value ~512
2 axes X and Y
1 Push-Button

II/Personal Part

d)Cabling/Wiring



II/Personal Task

c)Code

```
#include <Servo.h>

int x_key = A0;
int y_key = A1;
int x_pos;
int y_pos;

int x_key2 = A2;
int y_key2 = A3;
int x_pos2;
int y_pos2;

int x_key3 = A4;
int y_key3 = A5;
int x_pos3;
int y_pos3;
```

```
Servo servo1;
int servo1_pin = 2;
int initial_position = 90;

Servo servo2;
int servo2_pin = 4;
int initial_position2 = 90;

Servo servo3;
int servo3_pin = 7;
int initial_position3 = 90;

Servo servo4;
int servo4_pin = 8 ;
int initial_position4 = 90;

Servo servo5;
int servo5_pin = 12;
int initial_position5 = 90;

Servo servo6;
int servo6_pin = 13 ;
int initial_position6 = 90;
```

II/Personal Task

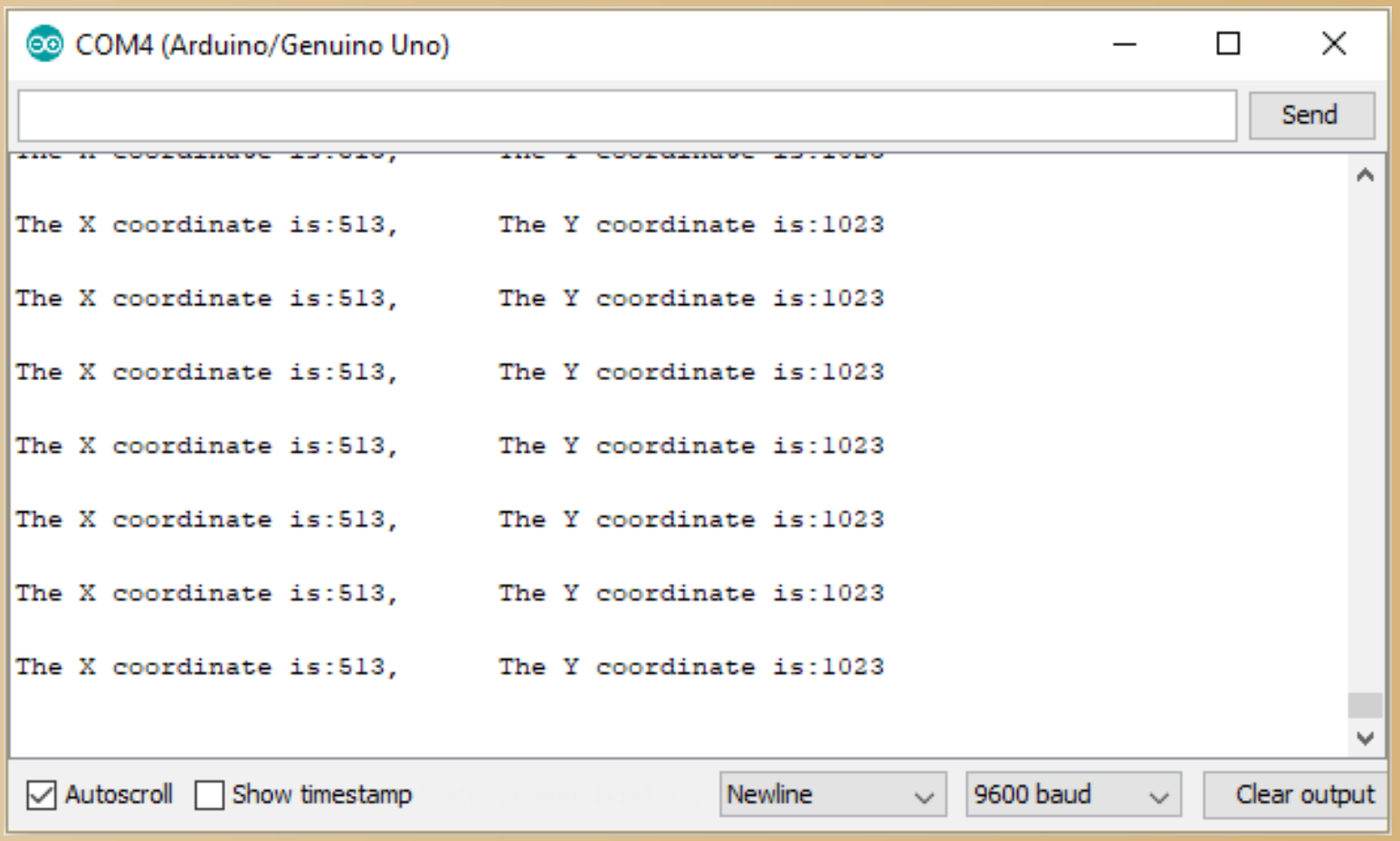
c)Code

```
void setup ( ) {
Serial.begin (9600) ;
servo1.attach (servo1_pin ) ;
servo1.write (initial_position);
servo2.attach (servo2_pin ) ;
servo2.write (initial_position2);
servo3.attach (servo3_pin ) ;
servo3.write (initial_position3);
servo4.attach (servo4_pin);
servo4.write (initial_position4);
servo5.attach (servo5_pin ) ;
servo5.write (initial_position5);
servo6.attach (servo6_pin);
servo6.write (initial_position6);
pinMode (x_key, INPUT) ;
pinMode (y_key, INPUT) ;
pinMode (x_key2, INPUT) ;
pinMode (y_key2, INPUT) ;
pinMode (x_key3, INPUT) ;
pinMode (y_key3, INPUT) ;
}
```

```
void loop ( ) {
x_pos = analogRead (x_key) ;
y_pos = analogRead (y_key) ;
x_pos2 = analogRead (x_key2) ;
y_pos2 = analogRead (y_key2) ;
x_pos3 = analogRead (x_key3) ;
y_pos3 = analogRead (y_key3) ;
```

```
if (x_pos < 300){ initial_position = initial_position - 5;}
servo1.write ( initial_position ) ;
if (x_pos > 700){ initial_position = initial_position +5;}
servo1.write ( initial_position ) ;
delay(20);

if (y_pos < 300){ initial_position2 = initial_position2 - 5;}
servo2.write ( initial_position2 ) ;
if (x_pos > 700){ initial_position2 = initial_position2 +5;}
servo2.write ( initial_position2 ) ;
delay(20);

if (x_pos2 < 300){ initial_position3 = initial_position3 - 5;}
servo3.write ( initial_position3 ) ;
if (x_pos2 > 700){ initial_position3 = initial_position3 +5;}
servo3.write ( initial_position3 ) ;
delay(20);

if (y_pos2 < 300){ initial_position4 = initial_position4 - 5;}
servo1.write ( initial_position4 ) ;
if (y_pos2 > 700){ initial_position4 = initial_position4 +5;}
servo4.write ( initial_position4 ) ;
delay(20);

if (x_pos3 < 300){ initial_position5 = initial_position5 - 5;}
servo5.write ( initial_position5 ) ;
if (x_pos3 > 700){ initial_position5 = initial_position5 +5;}
servo5.write ( initial_position5 ) ;
delay(20);

if (y_pos3 < 300){ initial_position6 = initial_position6 - 5;}
servo6.write ( initial_position6 ) ;
if (y_pos3 > 700){ initial_position6 = initial_position6 +5;}
servo6.write ( initial_position6 ) ;
delay(20);
```

```
    Serial.print("The X and Y coordinate 1:");
    Serial.print(x_pos2, DEC);
    Serial.print(",");
    Serial.println(y_pos2, DEC);
    Serial.println(" ");

}
```



II/Personal Task

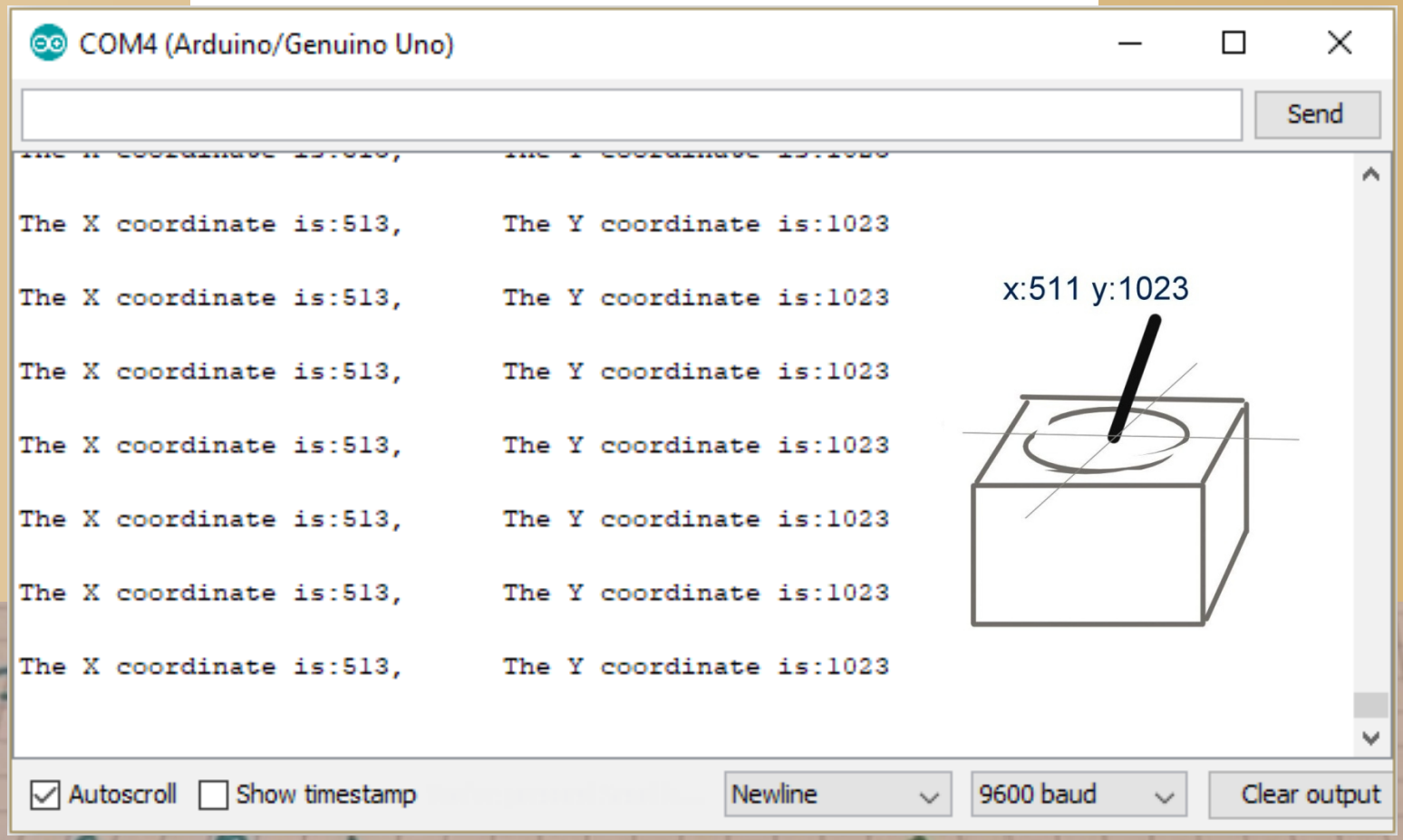
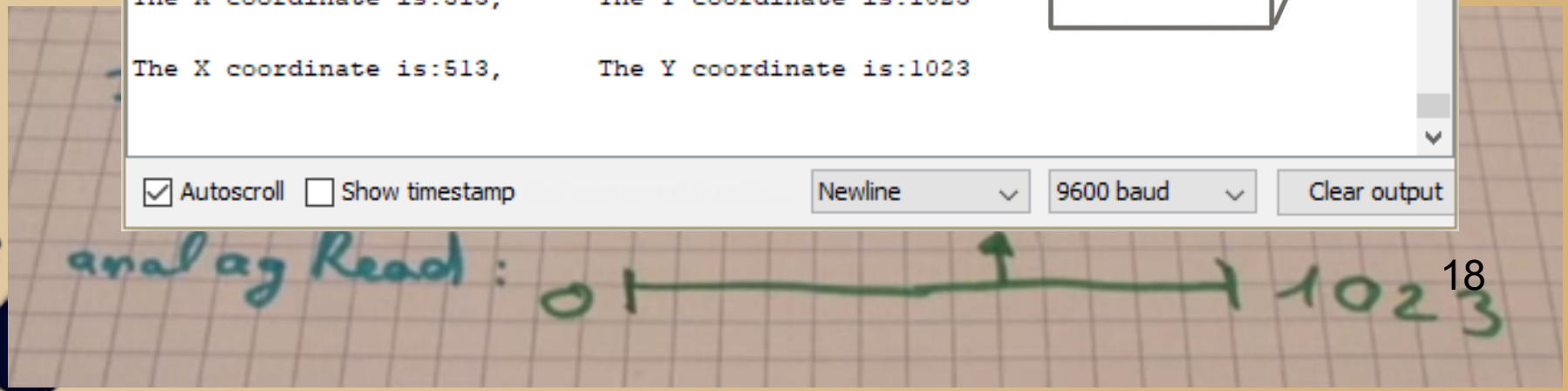
d)Conclusion

Video

III/Conclusion

- Protection of laboratories
- Take decisions
- Group work
- New knowledge

END

THANK YOU FOR LISTENING

How does a Joystick work ?