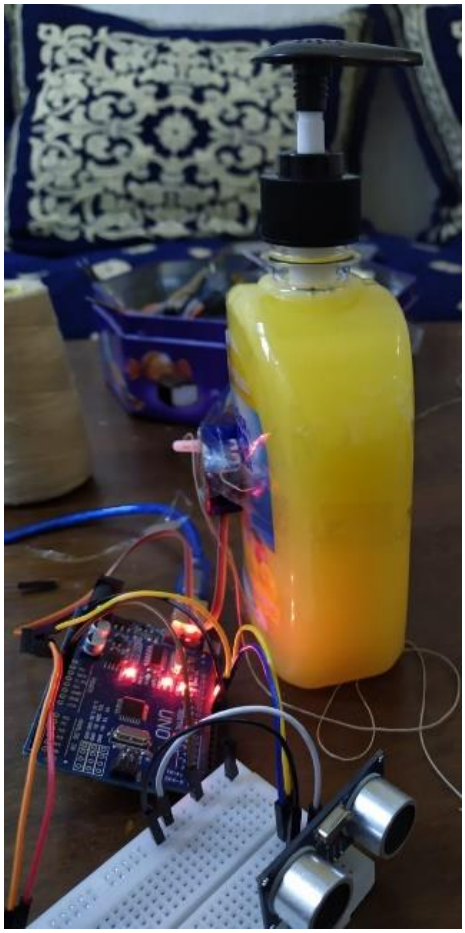


Atelier 3

Smart soap pump bottle

Anas Mansouri | 01/04/2020

Encadré par : Saad Motahhir

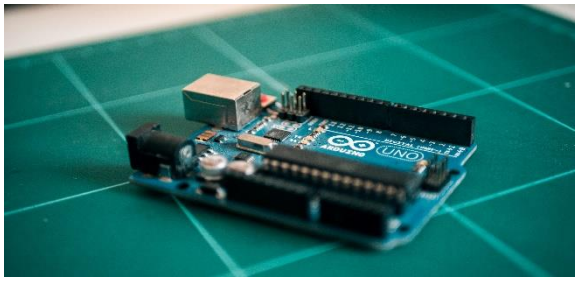
About This Project :

This project is a home made system to protect people against corona virus because if you use this system you will avoid touching the bottle so you will win a battle against the cornea.

Components and supplies :

- Arduino Uno

  The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board is equipped with sets of digital and analog input/output pins that may be interfaced to various expansion boards and other circuits.



- Servo Moror

  A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate and object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run through servo mechanism.

- Ultrasonic Sensor (hs-sr04)

  An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that relay back information about an object's proximity.

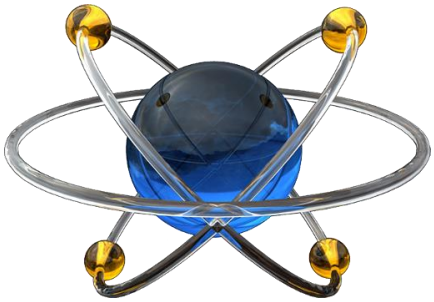
APPS AND ONLINE SERVICES :

- ARDUINO IDE

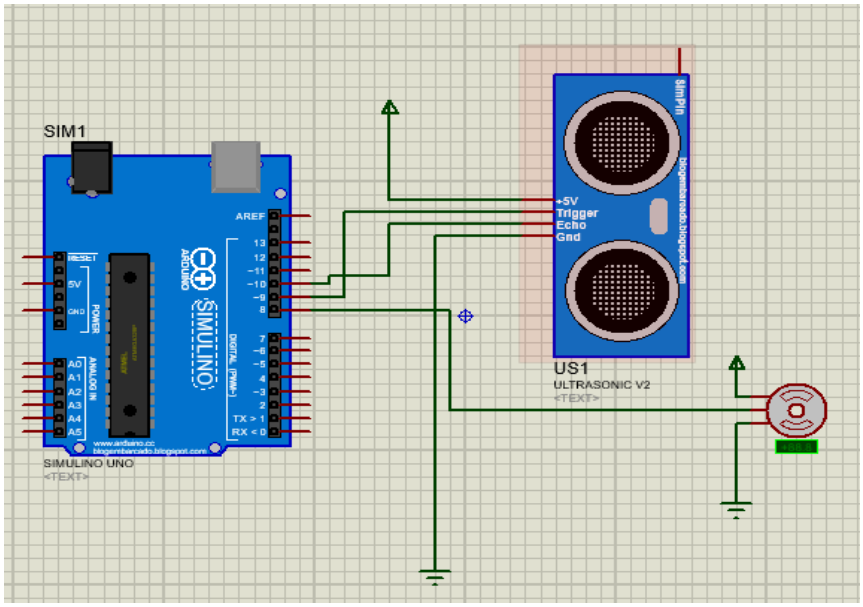
  The Arduino Integrated Development Environment is a cross-platform application that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of 3rd party cores, other vendor development boards.

- Proteus

  The Proteus is an electronic circuit design software which includes a schematic capture, simulation and PCB (Printed Circuit Board) Layout modules.



Schematics:



Code

Importing libraires

```
#include <Arduino_FreeRTOS.h>
#include <Servo.h>
```

Define Arduino pins numbers

```
const int trigPin = 9;
const int echoPin = 10;
```

Define global variables

```
Servo myservo ;
long duration;
int distance;
```

Setup

```
void setup() {
myservo.attach(8);
pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
pinMode(echoPin, INPUT); // Sets the echoPin as an Input
Serial.begin(9600); // Starts the serial communication

// Creating Task
xTaskCreate(tach_1,NULL,configMINIMAL_STACK_SIZE,NULL,1,NULL);
   vTaskStartScheduler();
}
```

Tache function

```
void tach_1(void)
{
    while(1){
            // 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);
            // Calculating the distance
            distance= duration*0.034/2;
            // Prints the distance on the Serial Monitor
            Serial.print("Distance: ");
            Serial.println(distance);
            if(distance <10){

              myservo.write(map(180,0,180,0,180));
            }else{
              myservo.write(map(0,0,180,0,180));
            }
    }
```

Conclusion

This is a simple project where you can learn how to use arduino with sensors and motors uding the freeRtos and his tools.