TOUCHLESS HANDWASH TIMER

Mini Project Report submitted in partial fulfillment of the requirement for the degree of

T. E. (Electronics Engineering)

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University of Mumbai 2020- 21

Abstract:

Touchless hand wash timer that shows a countdown clock for 20 seconds using an Ultrasonic sensor and a servo motor, following the COVID-19 guidelines.

Introduction:

In this redux of a hand-wash timer, our hand wash

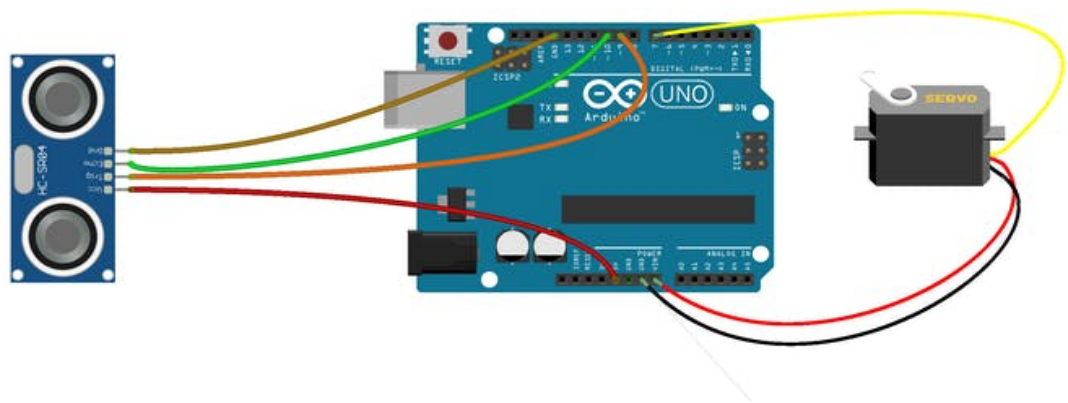
timer is activated by waving our hand in front of an ultrasonic sensor, and

displays the count down on a servo motor based clock.

Components:

- 3 Male / Male Jumper Wires
- 4 Female / Male Jumper Wires
- SG-90 Micro Servo (save the white plastic pieces called 'servo horns', you'll need one later)
- Arduino Uno
- HC-SR04 Ultrasonic Sensor
- Arduino IDE (Software)

Cicuit Diagram:



Procedure:

For the Ultrasonic sensor, use the Female / Male wires to connect the following pins:

- VCC -> 5V on the Arduino
- Trig -> Pin 9 on the Arduino
- Echo -> Pin 10 on the Arduino
- GND -> GND on the Arduino

For the Servo Motor, use the Male / Male wires to connect the following:

- Red Servo Wire (5V) -> Vin on the Arduino
- Black Servo Wire (GND) -> GND on the Arduino
- Orange Servo Wire (Signal) -> Pin 7 on the Arduino

After following the above steps for connecting the components, the code is launched in the Arduino IDE software and flashed onto the Arduino UNO.

Make sure to install the NewPing, EWMA, and Queue libraries from the Arduino library manager before running the sketch.

Arduino Code:

```
#include <Servo.h>

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

float duration, distance;

//this is the threshold where the sensor will trigger the
//countdown. If you are getting extra countdowns or the
```

```
//countdown won't start, you may need to adjust this for your sink
int threshold = 200;
Servo countServo;

void setup() {

  Serial.begin(9600);

  //attach pin 7 to servo and sweep it to indicate that the timer is on
  countServo.attach(7);
  countServo.write(180);
  delay(700);
  countServo.write(0);
  delay(700);
  countServo.write(180);
}

void loop() {
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);
  distance = (duration * .0343) / 2;
  Serial.println(distance);

  if (distance < threshold) {
    countdownServo();
  }
  delay(100);
}



//this moves the servo 4.5 degrees every half second
//to smooth out the movemnt (vs 9 degrees every second)
//for 20 seconds.
void countdownServo() {
  Serial.println("Counting down");
  int halfseconds = 40;

  for (int i = halfseconds; i >= 0; i--) {

    countServo.write((int)(i * 4.5));
    delay(500);
  }

  //reset the servo, clear the queue
  countServo.write(180);
  delay(700);
}
```

Once the sensor is in a good position, plug the Arduino into a USB wall adapter nearby. The servo should sweep back and forth, indicating the timer is active.

Result:

Using proper hand-washing technique is one of the things you can do right now to help keep yourself and others healthy. The CDC recommends washing for 20 seconds and this project will help people to make sure that they wash their hands just enough.

Future Scope:-

- Brings in a good hygienic habit for washing your hands properly even after the pandemic is over.
- Integrating it with a voice assistant to make it more interactive.
- Can also be used as a waterproof music player in the bathroom.

References:

https://www.hackster.io/331510/wash-a-lot-bot-a-diy-hand-washing-timer-2df500