

# BUILDING AN ARDUINO BASED CREEPY MASK

Junan Nashit Tias

Rifa Naziba

Shejat Nurani Rohan

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TREVOR TOMESH

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## INTRODUCTION

The project we have decided to do is an Arduino Based Simple mask. We have this project with a view to make a mask that will stare at someone when they come near to it.

Making a mask may look like something silly but when it's Halloween who doesn't want a good Halloween decoration? When little children come to our doors we like to amuse them with a good decoration. They will knock on our door and they will notice a mask is following them with creepy eyes.

Again not only on Halloweens, we can keep it in our living room. When our friends will come to our house it will also amuse them. It's easy to build and fun to see.

The main idea of the Arduino based creepy mask is that there will be an ultrasonic sensor attached with the body of the mask. When it will sense someone's presence within a certain radius a part of a display will light up and will create an illusion that they are staring at the person. Details will be further discussed in the paper.

## INSPIRATIONS

We are not the first person to come up with this idea of creating a mask or something that will stare at people. There are many people out there who have made this project and took it to newer levels of advancement. There are masks that's not only stare at people but also do lot of amusing tasks like say something or call them to come near.

We have browsed through different types of display and sensor based projects. The one we will be remaking is from the website [create.arduino.cc/projecthub](https://create.arduino.cc/projecthub) [1] This site helped us to identify clearly the materials that will be needed for the project including the type of display and sensor we will need.

The site <https://create.arduino.cc/projecthub> they made the mask by using 3D printer. For us, it is not possible for us to 3D printer. So I will be using construction papers and cardboard box to make the structure of a mask.

## DESIGNING PROCESS

The design of the creepy mask is very easy and it takes a few hours to make it stand up. The s is made of two ultrasonic sensors, two LCD1602 module, a breadboard and the Arduino UNO. The mask is made of construction papers and cardboard box.

The mask is made first. One can also buy any regular mask and then attach the microcontroller on it. Then holes are made in front of the mask to fit the ultrasonic sensors and the LCD displays in the front. It is used to sense the presence of anything approaching the mask so that the LCD display can see that way. The reason we didn't buy any mask because we could not find any mask where we can fit our LCD displays and sensors. Also, we thought it would be fun to make the whole thing on our own.

Initially, the plan was to use a Halloween decoration mask but as it was not enough we used construction papers and cardboard box. The picture of the building process is given in appendix B

The original plan with the Halloween decoration was to set the microcontroller outside of the mask by sticking it with glue with the outer body but later as cardboard box was used, we set up the cardboard and breadboard inside it. The picture of the setup is given in appendix C.

## BUILDING PROCESS

The materials required for the project-

- Arduino UNO
- Breadboard
- Ultrasonic sensor (2)
- LCD1602 module (2)
- Mask
- Jumper wires

### 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 with various expansion boards and other circuits” (Wikipedia).

The Arduino board is connected with the LED display and ultrasonic sensors. The pins of the Arduino board, 5V, GND and the digital pins are connected to the other materials through the breadboard.

### Ultrasonic sensor

The ultrasonic sensor can detect the person in front of the dustbin. The ultrasonic sensor works on the ultrasonic sound frequency. It has two pins TRIG and ECHO. trig pin transmits the ultrasound wave and ECHO pin receive the sound wave and the duration of the sound travel. So the ultrasonic sensors are used for the purpose of distance sensing.

For our mask, one ultrasonic sensor is attached in the left front and the other One is attached in the right front of the mask. Appendix F has a picture of the position.

## LCD1602 MODULE

‘LCD1602, or 1602 character-type liquid crystal display, is a kind of dot matrix module to show letters, numbers, and characters and so on. It's composed of 5x7 or 5x11 dot matrix positions; each position can display one character. There's a dot pitch between two characters and a space between lines, thus separating characters and lines. The model 1602 means it displays 2 lines of 16 characters’ (Wikipedia).

For our mask, one LCD1602 module is attached in the left front and the other One is attached in the right front of the mask. Appendix C has a picture of the position.

## USER MANUAL FOR CREEPY MASK

The set up of a creepy mask is very easy. The first and foremost work is to download the code into an Arduino UNO. Appendix E contains information to find the code. After uploading the code the rest of the materials are needed to set up. The picture in appendix B shows the connections.

1) Here, we're going to use 2 lcd displays to represent the eyes of the machine. The 2 lcds are connected using the common pins except for for pin E. The VSS and VDD pins are connected to GND and 5V on the arduino. D5-D7 are connected to 5,4,3,2 pins on the arduino. Pin 15 and 16 are for the backlight on the lcd display

2) We're going to use 2 ultrasonic sensors to detect objects within 50 cm radius on either side of the mask. Since we are using just 1 arduino, we did not have many pins left after connecting 2 displays. So, I put the left sensor on digital pin and the right sensor in analog pin. The trigger pin and echo pin on the left sensor is connected to pin 9 and 7 respectively. The trigger pin and echo pin on the right sensor is on A0 and A1.

A reference to the website from where the project is inspired is given below -  
[1]Admin. "UltrasonicEyes". [www.hackster.io](http://www.hackster.io). Apr 10, 2020.  
[https://www.hackster.io/unexpectedmaker/ultrasoniceyes-b9fd38?fbclid=IwAR01xVrsyunEqNDNEEIsTtuwRy\\_Ue-joNGOw3aGWu-xrGviBm3FIr1kOIdk](https://www.hackster.io/unexpectedmaker/ultrasoniceyes-b9fd38?fbclid=IwAR01xVrsyunEqNDNEEIsTtuwRy_Ue-joNGOw3aGWu-xrGviBm3FIr1kOIdk)

## SETBACKS AND FAILURES

In the project, one of the first difficulties I faced is to find a perfect mask. Though we were sure we would be using cardboard box to make the mask instead of buying a regular mask.

As a part of my project is inspired by the [arduino.cc/projecthub/unexpectedmaker/ultrasoniceyes](http://arduino.cc/projecthub/unexpectedmaker/ultrasoniceyes) and followed their materials requirement. However, we could not arrange everything as they said and in the mean time we face the epidemic COVID -19 , so it was not possible for us to order anything online or buy anything from the local store. First we thought , we will change our project and make something else but later we realize this project is too dear for us to change it last minute. So we decided to make it simple and stick to our original project. We made this project with whatever we had in our hand. Later we faced some problems with the coding. We didn't know how to use LCD1602 MODULE so we googled and went to the website <http://omerk.github.io/lcdchangen/>. It helped us a lot. We manage to work the LCD1602 MODULEs.

A major setback we thought would be in the project was working alone on individual problems as we could not go out due to the epidemic and we were communicating by video calls. At some point, we all were about to give up but then we decided to try our best and give it a shot. So, Tias was working with the code. Rohan and Rifa were arranging the materials. At the night of our submission we decided to meet and make the mask. We made the mask and captured the video.

However, the biggest failure of our project was we could not arrange a speaker. Our original plan was that the mask will make a noise whenever someone go near it.

## MILESTONES

Overall the project can be considered as a successful one because the main idea was to make a creepy mask. If it was not the time of epidemic and if we all could meet up or if we could get all the materials the project could be much better

The hardest part for us in the project was to make the project with the materials we had in our hands. We could not manage a speaker which was a big part of our project.

First we sketched two individual codes. The first one is to make the ultrasonic sensors work and second one to make the LCD display work. Measuring the distance on the code with the serial monitor so that the LCD display and ultrasonic sensor works at the right time was worth working for and we all enjoyed it.

## CONCLUSIONS

CS 207 is a class that focuses on developing students' interest in building and controlling multimedia arts and DIY projects. Though for the lab Arduino UNO was compulsory, we were allowed to use any type of microcontroller for the project we want to. As a programmer we used an Arduino UNO.

Making the creepy was very fun and making it with a group was more fun. Though our original plan was to make noise but we could not do it because of the situation. However, we manage to make an mask which will actually follow people with its' eyes. We tried hard and made it possible.



Honestly, it was hard for us to make this project. For a certain amount of time, we were very worried about how we will make this project or is it actually possible for us to make this project without essential materials .

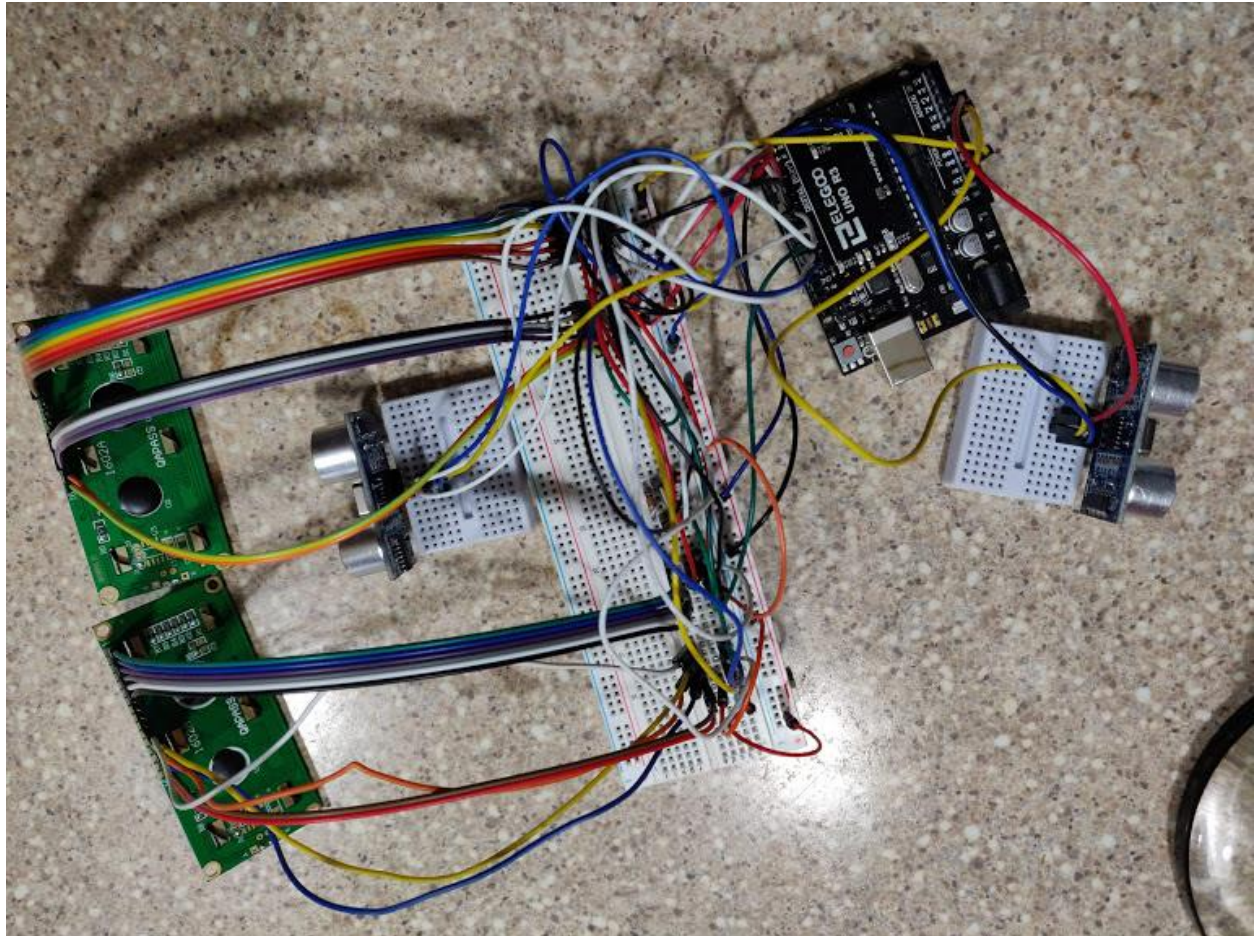
We were working in a group and in this situation it was very hard for us to get everything in sync. But in the end, we worked hard and were able to come up with something that makes our effort and this course successful.

## REFERENCES

- 1) [https://create.arduino.cc/projecthub/unexpectedmaker/ultrasoniceyes-b9fd38?ref=platform&ref\\_id=424\\_trending\\_\\_&offset=154](https://create.arduino.cc/projecthub/unexpectedmaker/ultrasoniceyes-b9fd38?ref=platform&ref_id=424_trending__&offset=154)
- 2) <http://omerk.github.io/lcdchargin/>

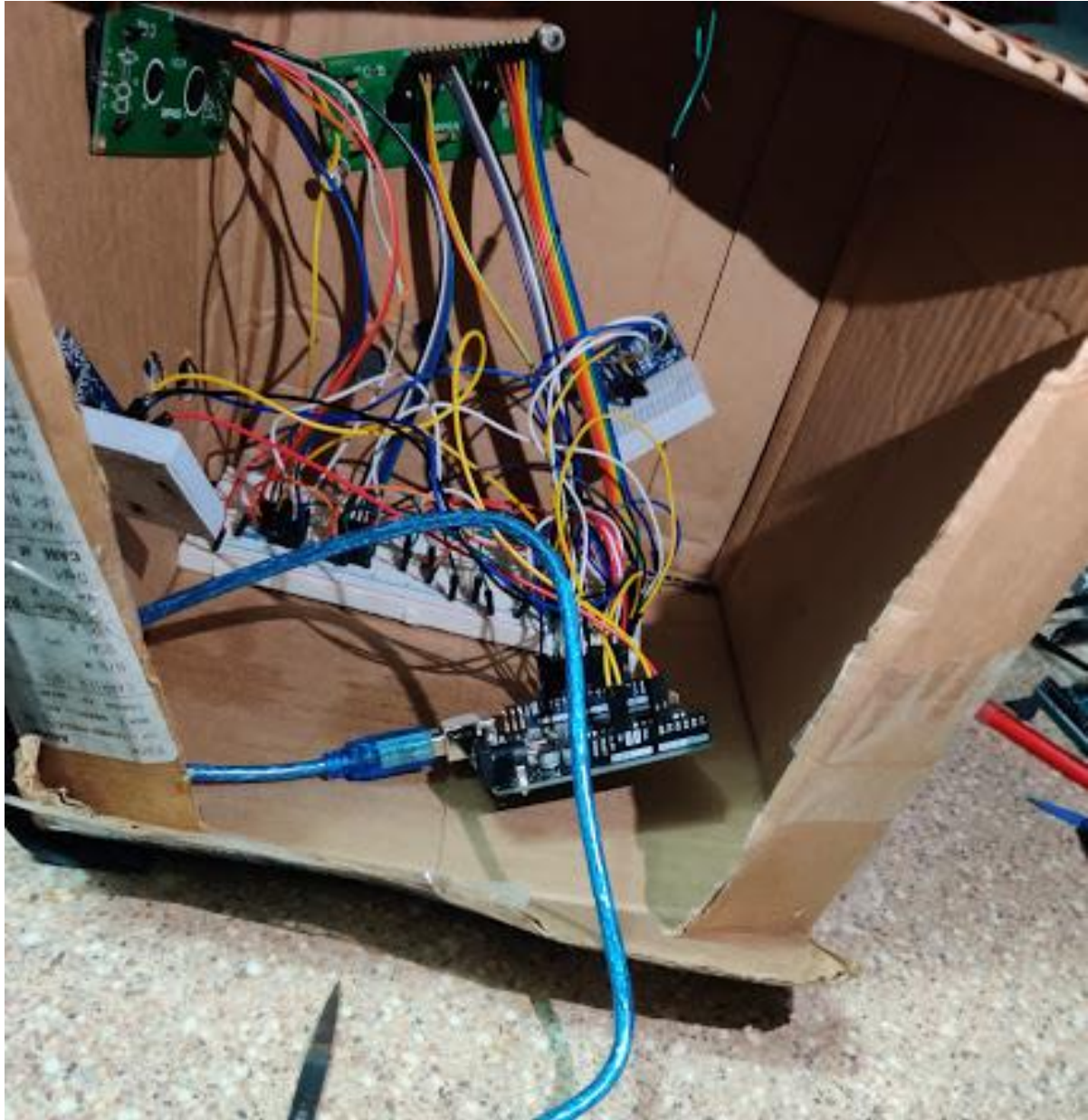
## APPENDIX

### Appendix A: Hardware Design



This is the final hardware design before putting the microcontroller and the other materials in the mask.

## Appendix B: setting the Arduino inside the mask



This is the final setting of the Arduino in the mask.

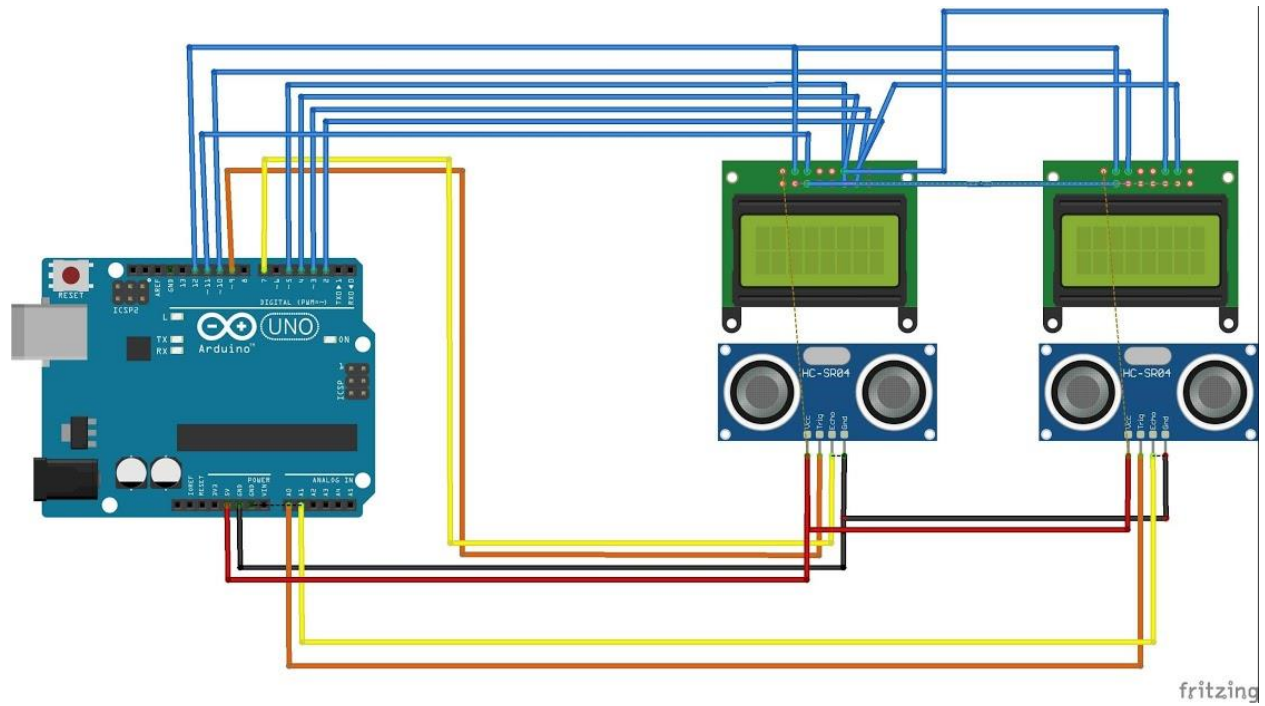


## Appendix C: The mask made with construction paper and cardboard box



The mask was made by cardboard box covering it with paper.  
The LCD display and sensors are connected to it.

## Appendix D: breadboard view of the connections of the mask



## Appendix E: The code

The codes required for this project are given in the GitHub link-  
<https://github.com/Jtias/ProjectA>

The QR code given below will also take you to the GitHub repository for the creepy mask



Scan the QR code.

## Appendix F: Arduino based creepy mask



This is the final result. As can be seen from the picture it has two ultrasonic sensor in the front and two lcd displays that will follow people.