

# **Advanced Creative Computing Weekly Diary**

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## **GITHUB LINK:**

[https://github.com/orionmel/20013506\\_Kixin-Mei\\_Physical\\_Final\\_Project](https://github.com/orionmel/20013506_Kixin-Mei_Physical_Final_Project)

## **VIDEO LINK:**

<https://vimeo.com/651573760>

## **PDF:**

[https://github.com/orionmel/20013506\\_Kixin-Mei\\_Physical\\_Final\\_Project/blob/main/Final%20Project.pdf](https://github.com/orionmel/20013506_Kixin-Mei_Physical_Final_Project/blob/main/Final%20Project.pdf)

## **FINAL PROJECT CODE:**

[https://github.com/orionmel/20013506\\_Kixin-Mei\\_Physical\\_Final\\_Project/tree/main/Final%20Code%20%26%20Module%20list%20%26%20circuit%20diagram%20File](https://github.com/orionmel/20013506_Kixin-Mei_Physical_Final_Project/tree/main/Final%20Code%20%26%20Module%20list%20%26%20circuit%20diagram%20File)

## Part1: learn, research and prepare the sensor

### Time:

week4:10/20 -10/27

week5:10/27—11/03

### The task of this session:

Determine the design theme of the physical making project, conduct second-hand research on the internet, conduct first-hand research on this topic, export questions based on the content of the research, then do brainstorming, and finally determine the design direction, refer to interactive artwork, prepare and purchase the required items

### 【Pre-research typography】

#### INTRODUCTION

As our personal symbol, **the name** has a profound meaning and function. It may reflect the good expectations and blessings of our parents at the beginning, and it may also reflect a person's character, and even contains all kinds of stories. But nowadays, "**Inappropriate names**" have brought us exclusion and racial discrimination. These phenomena not only occur in our real lives, but also in the virtual online world. The existence of name discrimination is not just about hurting a person's self-esteem. It also destroys a person's life.

#### RESEARCH

##### Name discrimination in study abroad



During the 2017 Chinese New Year, many Chinese students' brands at Columbia University were deliberately torn up because of Chinese Pinyin. This racial discrimination, conveyed by name, prompted the then Chinese students of Columbia to make a video of "Say My Name", tell the world what it means behind the Chinese name, and rebel in this way.

#### CATEGORY

- Racial bias
- Gender bias
- Cultural Bias
- Religious Bias
- Class bias
- Age bias

#### Discrimination in the employment market

A study launched by the British Academy at the beginning of the year revealed that on average 24 per cent of applicants of white British origin received a positive response from employers. Only 15 per cent of minority ethnic applicants, who applied with identical CVs and covering letters, received positive responses.

##### In the election



##### Celebrity lotions

Kal Penn [real name: Kalpen Modi] Actor Kal Penn (real name is Karpan Modi, Kalpen Modi), Kelly Marie Tran (The local name is Tin Loan) and Canadian-Indian Bollywood actress Sunny Leone (formerly Karenjitt Kaur Vohra). They all changed their names at birth



## PROBLEM STATEMENT

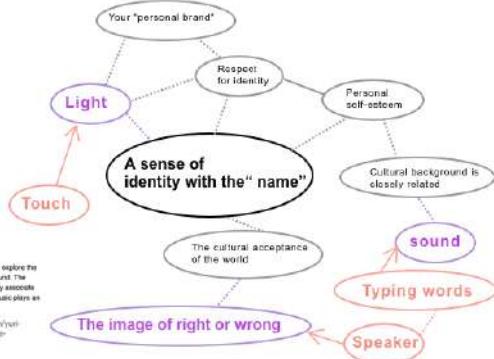
Name discrimination is due to a long history of cultural influence, and the root cause is the existence of this diversity. The current focus of attention on name discrimination should be not only from the name itself, but should be derived from the social and cultural context of the whole, by name discrimination, racial discrimination in its core and other reasons, and the existence of a variety of adverse conditions for the discriminated.

## IDEATION&REFERENCE



## DESIGN DIRECTION

I hope to start from the perspective of being discriminated against, from the negative feedback that society brings to the discriminated person when the name is displayed in front of people, so as to trigger the public to think about name discrimination, this kind of discrimination will have a devastating impact on people. What we really should do is to embrace cultural diversity and understand each culture.



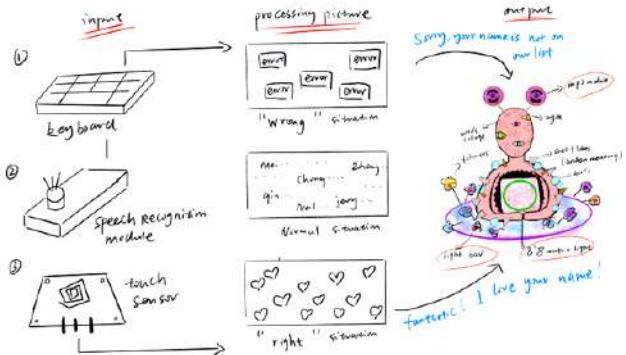
## DESIGN DEVELOPMENT

### INPUT[3]:

- Digital signal input with **touch module**
- Digital signal input by **keyboard**
- Digital signal input by **Speech recognition module**

### OUTPUT[4]:

- Light output by **the light bar**
- Processing screen switching**
- The noise played by **the mp3 module**
- output light by **8\*8 matrix light**



## COMPONENT COLLECTION



## [The list of parts]

	A	B
<b>The list of materials</b>		
1	NUM	NAME
2	1	arduino UNO
3	2	MP3 Player Module
4	3	Speaker module
5	4	speech recognition module
6	5	60 plants/m 2812 lamp belt
7	6	8 x 8 2812 light board
8	7	9 x 15 Strip board
9	8	5V 10A switching power supply
10	9	Three plug in the power cord
11	10	DC power head
12	11	Usb extension cord
13	12	SM3PIN extension cord
14	13	2. 54 DuPont Line
15	14	Touch Sensor Module

## Part2: Test sensor and prototype

### Time:

week6:11/03--11/10

week7:11/10--11/17

### The task of this session:

First of all, the processing screen code is completed, every day a variety of sensor and processing screen switch testing, the production of packaged stone mud man low-fidelity model, testing and debugging function until there is no problem at all

### Test1: Test the speech recognition module for screen conversion

Link: <https://vimeo.com/manage/videos/651082793>

<https://vimeo.com/manage/videos/651084155>

### Code:

```
1 #include "ASR.h"
2
3 void setup() {
4     unsigned char clock = 0xFF;
5     unsigned char asr_version = 8;
6     Wire.begin();
7     Wire.setClock(100000);
8     Serial.begin(115200); //设置串行三连敲击间隔时间继电器从毫秒到分钟，读取串行数据后自动切换继电器间隔时间
9     pinMode(7,OUTPUT); //设置继电器驱动引脚
10
11     ASRReadData(FIRMWARE_VERSION,&asr_version,1);
12     Serial.println("asr_version is :");
13     Serial.println(asr_version);
14
15     #if 0
16     I2CWrite(ASR_CLEAR_ADDR,0x40); //没有帧起始地址或帧结束地址，直接写入操作码后操作由地址译码
17     BusyWait();
18     Serial.println("clear flash is ok");
19     I2CWrite(ASR_MODEL_ADDR,0x0); //地址译码后操作由地址译码
20     BusyWait();
21     Serial.println("mode set is ok");
22     ASRReadData(1,"hong ding");
23     BusyWait();
24     ASRReadData(2,"lv ding");
25     BusyWait();
26     ASRReadData(3,"tan ding");
27     BusyWait();
28     ASRReadData(4,"guan ding");
29     BusyWait();
30     ASRReadData(5,"kai feng shang");
31     BusyWait();
32     ASRReadData(6,"open feng shang");
33     BusyWait();
34     while(clock != 0)
35     {
36         ASRReadData(ASR_NUM_CLOCK,&clock,1);
37         Serial.println(clock);
38         delay(100);
39     }
40     Serial.println("clock is ok");
41 }
42
43 I2CWrite(ASR_REC_GATE,0x40); //启动录音功能并进行波特率设置0x40-0x55
44 I2CWrite(ASR_VOICE_FLAG,1); //启动语音识别功能并进行波特率设置0x40-0x46
45 I2CWrite(ASR_BUZZER,1); //启动蜂鸣器功能并进行波特率设置0x40-0x46
46 RGB_Set(255,255,255); //启动RGB灯功能并进行波特率设置0x40-0x46
47 delay(500);
48 I2CWrite(ASR_BUZZER,0); //关闭蜂鸣器功能
49 RGB_Set(0,0,0); //关闭RGB灯功能
50
51 }
52
53 void loop()
54 {
55     unsigned char result;
56     I2CRead(ASR_RESULT,&result,1); //读取识别结果并将其存储在变量result中
57     delay(100);
58     Serial.println(result);
59
60     if(result == 5)//识别结果为“你好，请问有什么可以帮助你...”
61     {
62         digitalWrite(7,1);
63     }
64     else if(result == 6)//识别结果为“好的，我将帮助你完成任务...”
65     {
66         digitalWrite(7,0);
67     }
68 }
```

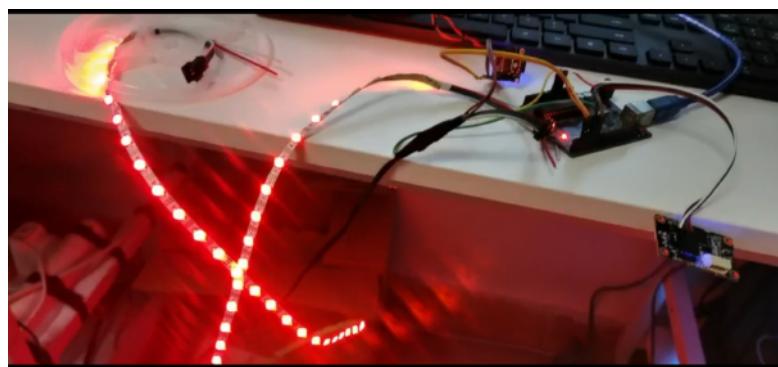


## Test2: Test lights - Test mp3 player

Link: <https://vimeo.com/651086384>

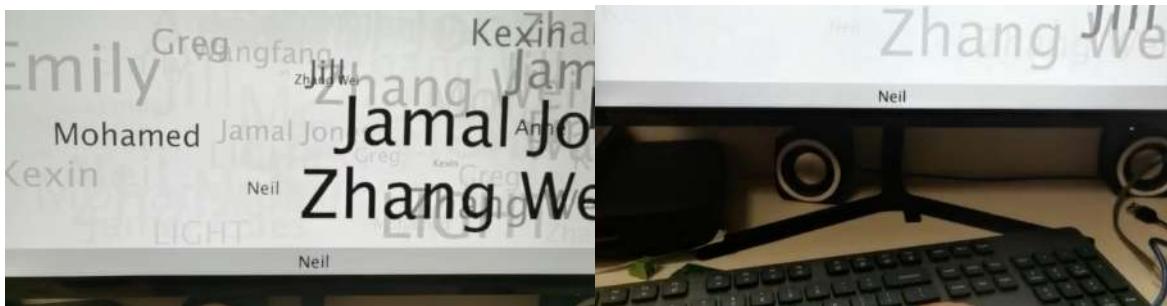
Code:

```
2812
1 // NeoPixel Ring simple sketch (c) 2013 Shae Erisson
2 // Released under the GPLv3 license to match the rest of the
3 // Adafruit NeoPixel library
4
5 #include <Adafruit_NeoPixel.h>
6 #ifndef __AVR__
7 #include <avr/power.h> // Required for 16 MHz Adafruit Trinket
8 #endif
9
10 // Which pin on the Arduino is connected to the NeoPixels?
11 #define PIN          6 // On Trinket or Gemma, suggest changing this to 1
12
13 // How many NeoPixels are attached to the Arduino?
14 #define NUMPIXELS 16 // Popular NeoPixel ring size
15
16 // When setting up the NeoPixel library, we tell it how many pixels,
17 // and which pin to use to send signals. Note that for older NeoPixel
18 // strips you might need to change the third parameter -- see the
19 // strandtest example for more information on possible values.
20 Adafruit_NeoPixel pixels(NUMPIXELS, PIN, NEO_GRB + NEO_KHZ800);
21
22 #define DELAYVAL 500 // Time (in milliseconds) to pause between pixels
23
24 void setup() {
25   // These lines are specifically to support the Adafruit Trinket 5V 16 MHz.
26   // Any other board, you can remove this part (But no harm leaving it):
27 #if defined(__AVR_ATtiny85__) && (F_CPU == 16000000)
28   clock_prescale.set(clock_div_1);
29 #endif
30   // END of Trinket-specific code.
31
32   pixels.begin(); // INITIALIZE NeoPixel strip object (REQUIRED)
33 }
34
35 void loop() {
36   pixels.clear(); // Set all pixel colors to 'off'.
37
38   // The first NeoPixel in a strand is #0, second is 1, all the way up
39   // to the count of pixels minus one.
40   for(int i=0; i<NUMPIXELS; i++) { // For each pixel...
41
42     // pixels.Color() takes RGB values, from 0,0,0 up to 255,255,255
43     // Here we're using a moderately bright green color:
44     pixels.setPixelColor(i, pixels.Color(0, 150, 0));
45
46   pixels.show(); // Send the updated pixel colors to the hardware.
47
48   delay(DELAYVAL); // Pause before next pass through loop
49 }
50 }
```



## Test3: Test keyboard input, processing screen conversion

Link: <https://vimeo.com/651087979>



## Test4: Test LED 8x8 & MP3 Module

Link: <https://vimeo.com/651091055>

### Code[MP3]:

```

play
1 /*
2 *file play.ino
3 *brief Music Playing Example Program
4 *details Experimental phenomenon: control MP3 play music, obtain song information
5 *copyright Copyright (c) 2010 DFRobot Co.Ltd (http://www.dfrobot.com)
6 *license The MIT license (MIT)
7 *author [Fengli] (M.I.T. license (MIT))
8 *version V1.1
9 *date 2021-10-15
10 *url https://github.com/DFRobot/DFRobot\_DF12015
11 */
12
13 #include <DFRobot_DF12015.h>
14 #include <SoftwareSerial.h>
15
16 SoftwareSerial DF12015Serial(2, 3); //RX TX
17 boolean start_flag = false;
18
19 DFRobot_DF12015 DF12015;
20 void setup();
21 void setup(void){
22   Serial.begin(115200);
23   DF12015Serial.begin(115200);
24   while(!DF12015.begin(DF12015Serial)){
25     Serial.println("Init failed, please check the wire connection!");
26     delay(1000);
27   }
28   /*Set volume to 20*/
29   DF12015.setVol("VOL = */10";
30   /*Get volume*/
31   Serial.println(DF12015.getVol());
32   /*Enter music mode*/
33   DF12015.switchFunction(DF12015.MUSIC);
34   /*Wait for the end of the prompt tone */
35   delay(2000);
36   /*Set playback mode to "repeat all"*/
37   DF12015.setPlayMode(DF12015.ALLCYCLE);
38   Serial.print("PlayMode:");
39   /*Get playback mode*/
40   Serial.println(DF12015.getPlayMode());
41
42   /*Set baud rate to 115200(Need to power off and restart, power-down save)
43   //DF12015.setBaudRate(115200);
44   //Turn on indicator LED (Power-down save)
45   //DF12015.setLED(true);
46   //Turn on the prompt tone (Power-down save)
47   //DF12015.setPrompt(true);
48   //Enable amplifier chip
49   //DF12015.enableAMP();
50   //Disable amplifier chip
51   //DF12015.disableAMP();
52 }
53 */
54
55 void loop(){
56   if(start_flag == false){
57     Serial.println("start playing");
58     DF12015.play();
59     DF12015.playFileNum("File Number = */10");
60     delay(10000);
61     Serial.println("Pause");
62     /*Pause*/
63     DF12015.pause();
64     delay(3000);
65     start_flag = true;
66   }
67   else{
68     Serial.println("Next");
69     /*Play the next song*/
70     DF12015.next();
71     delay(3000);
72     Serial.println("Previous");
73     /*Play the previous song*/
74     DF12015.last();
75     delay(3000);
76     Serial.println("Start playing");
77     /*Fast forward*/
78     DF12015.fastForward("FF = */10");
79     /*Fast Rewind 10S
80     //DF12015.fastReverse("FF = */10);
81     //Start the song from the 10th second
82     //DF12015.setPlayTime("Play Time = */10);
83     //Get file number
84     Serial.print("File number:");
85     //Get file number
86     Serial.println(DF12015.getCurFileName());
87     //Get the number of files available to play;
88     Serial.print("The number of files available to play:");
89     //The number of files available to play
90     Serial.println(DF12015.getTotalFile());
91     //Get the time length of the current song has played;
92     Serial.print("The time length the current song has played:");
93     //Get the time length the current song has played
94     Serial.println(DF12015.getCurTime());
95     //Get the total length of the currently-playing song
96     Serial.print("The total length of the currently-playing song:");
97     //Get the total length of the currently-playing song
98     Serial.println(DF12015.getTotalTime());
99     //Get the name of the currently-playing file;
100    Serial.print("The name of the currently-playing file: ");
101    Serial.println(DF12015.getFile());
102    //Delete the file
103    //Play the file No.1, the numbers are arranged according to the sequence of the files
104    DF12015.playFileNum("File Number = */10");
105    //Play the test.mp3 file in test folder
106    //DF12015.playSpecFile("test/test.mp3");
107    //While(1);
108    //Delete the currently-playing file */
109    //DF12015.delCurFile();
110
111 }

```

## Test5: Test the touch sensor module

Link: <https://vimeo.com/651102073>

### Code:

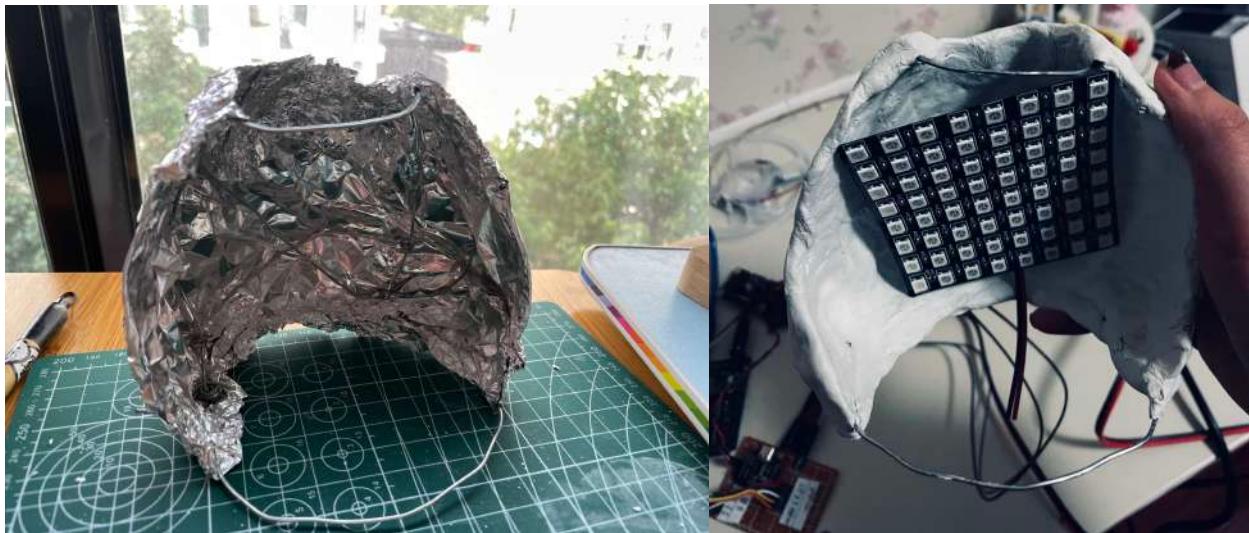
```

1 // constants won't change. They're used here to set pin numbers:
2 const int SENSOR_PIN = 7;           // the Arduino's input pin that connects to
3
4 // Variables will change:
5 int lastState = LOW;    // the previous state from the input pin
6 int currentState;      // the current reading from the input pin
7
8 void setup() {
9   // initialize serial communication at 9600 bits per second:
10  Serial.begin(9600);
11  // initialize the Arduino's pin as an input
12  pinMode(SENSOR_PIN, INPUT);
13 }
14
15 void loop() {
16   // read the state of the the input pin:
17   currentState = digitalRead(SENSOR_PIN);
18
19   if(lastState == LOW && currentState == HIGH)
20     Serial.println("The sensor is touched");
21   else if(lastState == HIGH && currentState == LOW)
22     Serial.println("The sensor is released");
23
24   // save the the last state
25   lastState = currentState;
26 }
```

## **Difficulties& improvement:**

1. When testing the speech recognition module, I have spent a lot of time exploring it because I have not touched this module. At present, there are still unstable problems after the test.
2. The light matrix is also more complicated, I need to write the shape I want
3. I tried soldering for a long time , because i haven't try this before

## **Low-fidelity mud molding production:**



## Part3: circuit diagram and final editing

### Time:

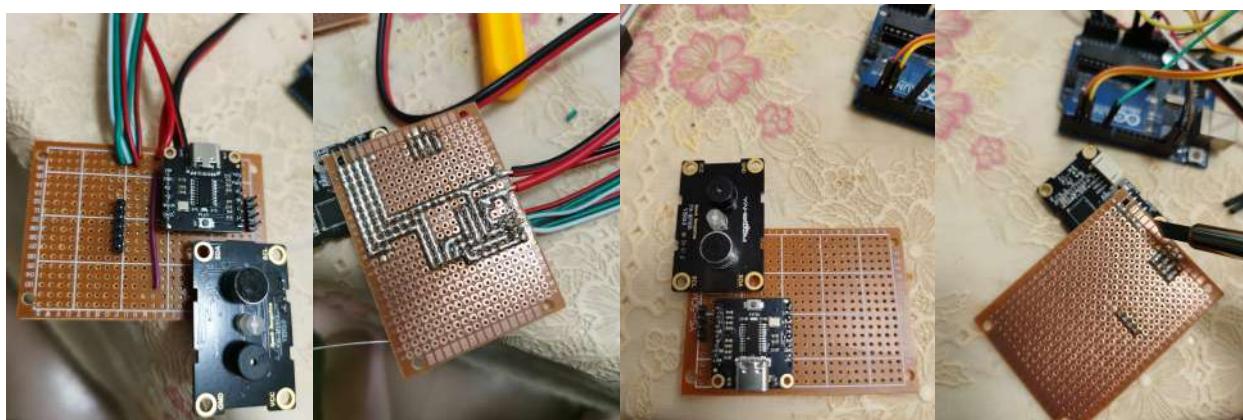
week8:11/17--11/24

week9&10:11/24--11/01

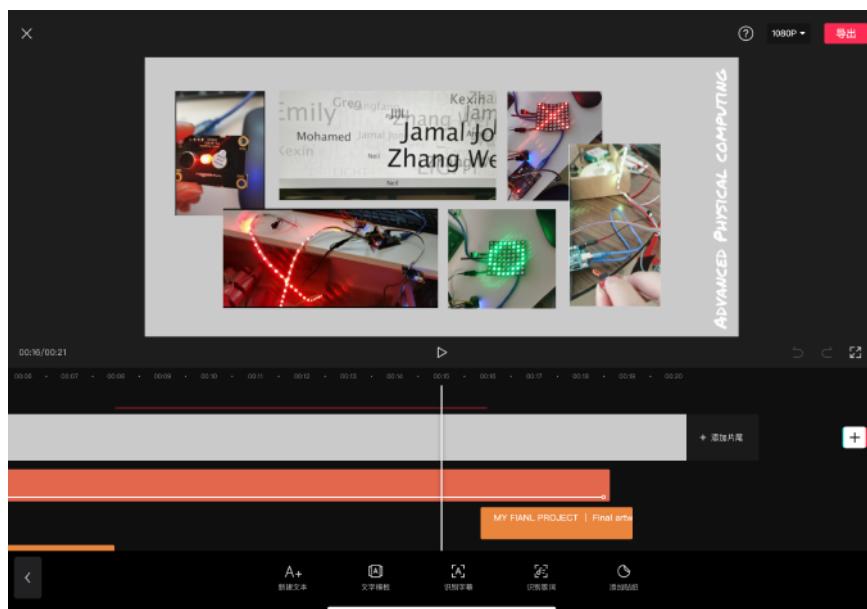
### The task of this session:

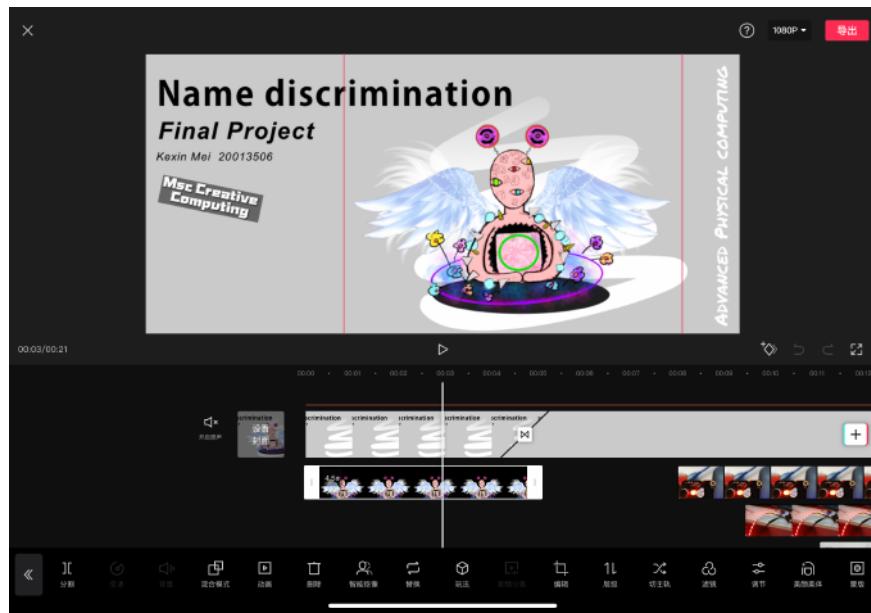
Connect the individual circuit boards, draw circuit diagrams, then soldering, integrate all the materials above, make physical sculptures, make final text layouts, and shoot video edits.

### Work1: Soldering



### Work2: Editing video

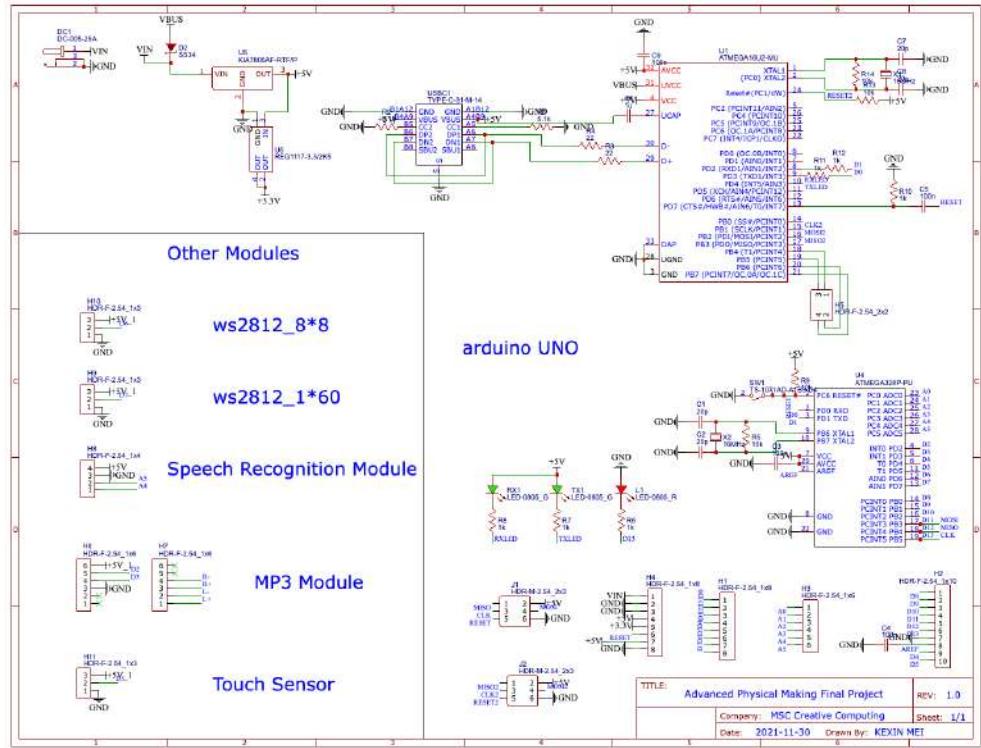




### Work3: Final sculpture



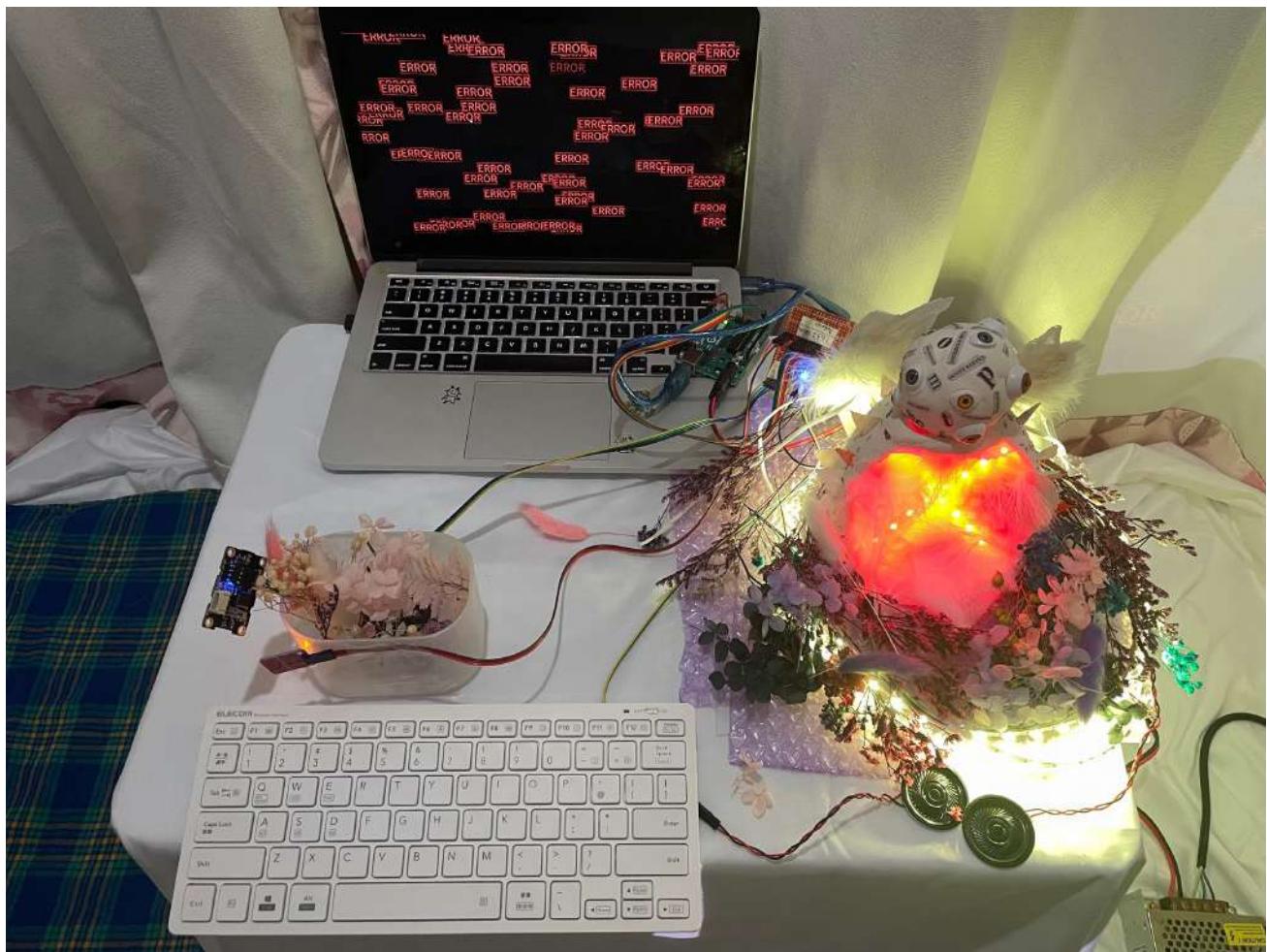
### Work4: Final Arduino boards& diagrams



## Final Artwork

### The possibility of future projects:

1. Continue to improve the current accessories, because voice input I only stored a few names, I think about whether in the future can be combined with AI database storage
2. The sensitivity of speech input needs to be adjusted, and when I tested it, I found that there was an insensitivity problem in the speech module
3. I want to make this topic practical in the future from the perspective of derivation, from the perspective of user experience, how to let others learn from the beginning to avoid the problem of name discrimination, you can try to use the current mobile phone and other devices for secondary design



**Output:**

1. Noise sound ( mp3 module )
2. Light ( 8\*8 Led & Led stripe )
3. Image change ( processing )

**Input:**

1. Speaker voice ( speech recognition module )
2. Touch ( touch sensor )
3. Typing words( keyboard )