IMPRISONED SHADOW PUPPET

Inherit traditional culture

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BACKGROUND

Why am i doing this?

Traditional things are being forgotten by us. If we do not pay attention now, many traditional folk cultures will disappear completely in the future.

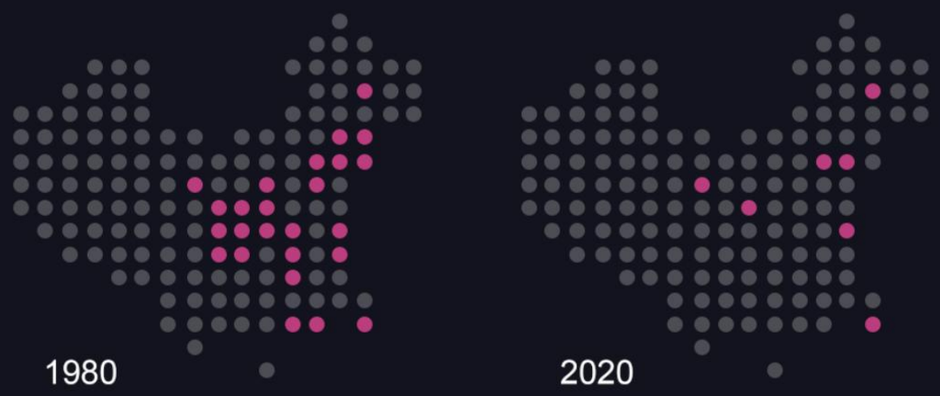
As a product of a period, shadow puppets have brought countless good memories to people. But with the advent of technology such as televisions and computers, few people have passed on this traditional folk art, so I tried my best to keep this classic visual form.

traditional shadow puppet

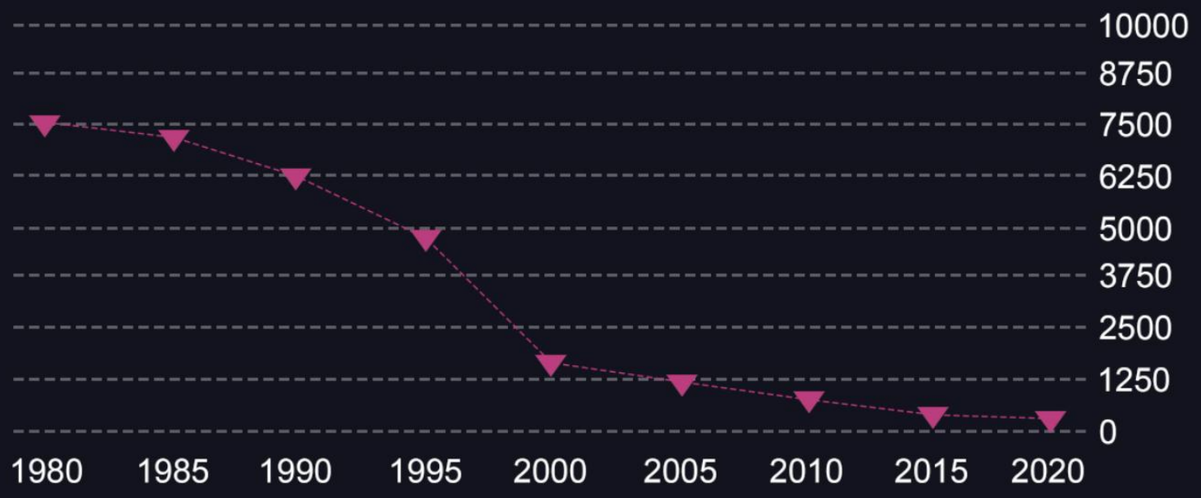
modern technology

RESEARCH

Comparison of the distribution of shadow puppet performers in China. (1980 and 2020)



The number of public performances of shadow puppet in China. (1980-2020)



INSPIRATION

Bird cage

Chinese lantern

Table football

Shackle cage

Water well rope

Bird cage:
Appearance inspiration

Chinese lantern:
Screen material inspiration

Water well rope:
Shadow puppet
traction rope inspiration

Shackle cage:
Internal structure inspiration

Table Football:
Inspiration for interaction with
shadow puppet

DESIGN CONCEPT


--- Servo


--- Distance sensor

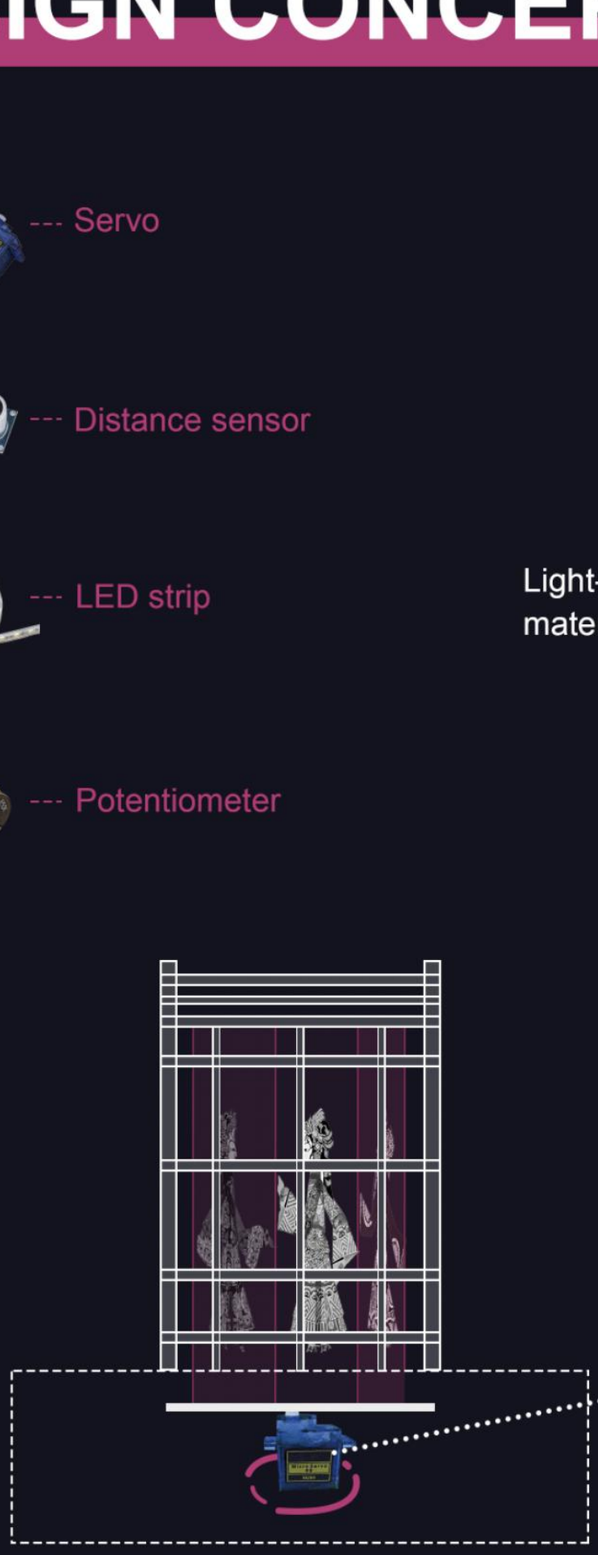

--- LED strip


--- Potentiometer

Light-transmissive material

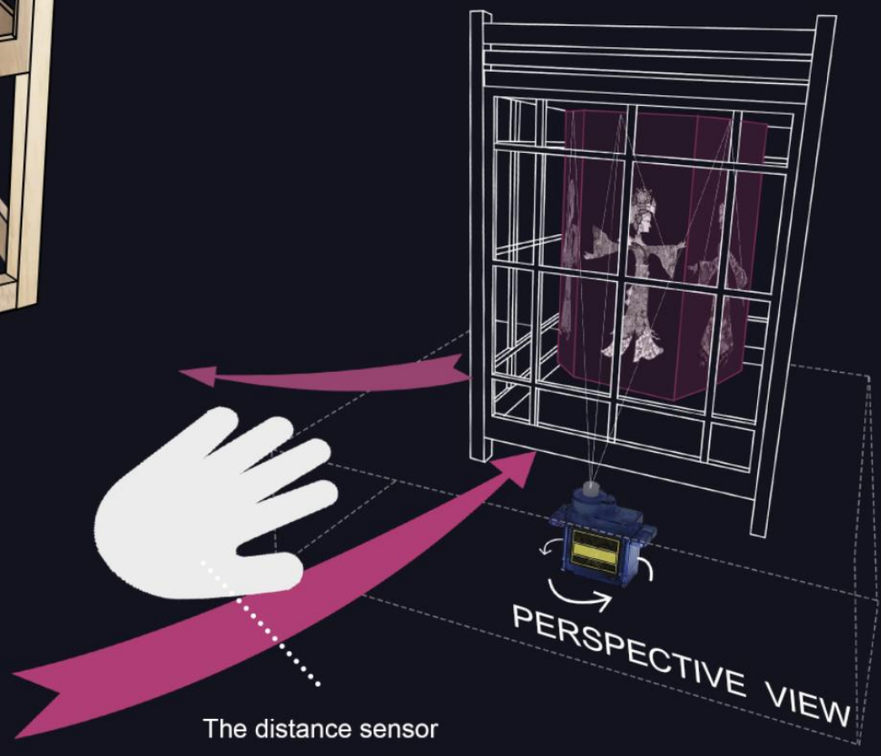
Wooden strip material

The framework of the cage element



FRONT VIEW

The servo is controlled by a potentiometer to drive the shadow puppet to interact with people



The distance sensor
will control the LED light and dark changes
according to the distance of the hand

CODING

sketch_dec09a §

```
#include <Adafruit_NeoPixel.h>
#ifdef __AVR__
#include <avr/power.h>
#endif

#define LIGHTDISTANCE  28.0
#define LIGHTMAX       255.0
#define LIGHTMIN       0.0

#define PIN            10
#define NUMPIXELS      34

#define Trig           13
#define Echo           12
```

```
Adafruit_NeoPixel pixels = Adafruit_NeoPixel(NUMPIXELS, PIN, NEO_GRB + NEO_KHZ800);

float cm0;
float cm;
float temp = 0;
float ledValue;
float readValue;
int j=0;
int light = 0;
int servopin = 3;
const int motor = A0;
const int rotate = A2;

void servopulse(int angle){
  for(int i = 0; i<50; i++){
 int pulsewidth=(angle*11)+500;
 digitalWrite(servopin,HIGH);
 delayMicroseconds(pulsewidth);
 digitalWrite(servopin,LOW);
 delayMicroseconds(20000-pulsewidth);
  }
}
```

```
float clean(float num){
  float a;
  if(num > 900.0){
  a = 2.5;
  }

  else if(num >= LIGHTDISTANCE-0.6){
  a = LIGHTDISTANCE;
  }

  else{
  a = num;
  }
  return a;
}

float mapclean(float input1, float range1start, float range1end, float range2start, float range2end){
  float output1 = (input1-range1start)/(range1end - range1start)*(range2end-range2start) + range2start;
  if(output1 < range2end){
    output1 = range2end;
  }
  else if(output1 > range2start){
    output1 = range2start;
  }
  return output1;
}
```

```
void setup(){
  Serial.begin(9600);
  pinMode(Trig, OUTPUT);
  pinMode(Echo, INPUT);
  pinMode(motor, OUTPUT);
  pinMode(servopin, OUTPUT);
  pinMode(10,OUTPUT);
  pixels.begin(); // This initializes the NeoPixel library.
}
```

```
void loop(){
  digitalWrite(Trig, LOW);
  delayMicroseconds(2);
  digitalWrite(Trig,HIGH);
  delayMicroseconds(10);
  digitalWrite(Trig, LOW);
  temp = float(pulseIn(Echo, HIGH));
  cm0 = (temp * 17 )/1000;

  if(j == 0){
  cm = clean(cm0);
  }
  else if((j > 0) && (clean(cm0) != 2.5)){
  cm = (clean(cm) + clean(cm0))/2;
  }
  else if(clean(cm0) == 2.5){
  cm = cm;
  }
```

```
  light = mapclean(cm, 2.5, LIGHTDISTANCE, LIGHTMAX, LIGHTMIN);;
  readValue = analogRead(rotate);
  float lightr = mapclean(light, LIGHTMAX, LIGHTMIN, 1.00, 0.00);

  ledValue = map(readValue, 22, 1021, 0, 180);


  servopulse(ledValue);
  Serial.println(ledValue);

  digitalWrite(10, HIGH);
  for(int i=0;i<NUMPIXELS;i++){
    pixels.setPixelColor(i, pixels.Color(lightr*255,lightr*220,lightr*127));
    pixels.show();
  }

  j++;
  delay(1);
}
```

INSTALLATION MAKING

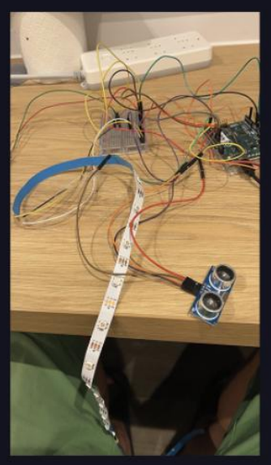
Making
wooden frame

Sticking
transparent paper

Printing
shadow puppet

Connecting
Structure

Testing
flexibility



Connecting
circuit

Adjusting
brightness

FINAL DESIGN

Video Link:

https://youtu.be/jO4M4Q-19B8