

EMO

IMMERSIVE SPACE BASED ON EMOTION VISUALIZATION

Emo is an interactive immersive space based on facial recognition and emotion detection. It aims to help us become more self-conscious, meanwhile reflect our emotional state.

<https://xiyingbao.webflow.io/emo>

Tools



Contribution: Individual work

Concept, coding, modeling,
physical construction



RESEARCH



Fig1. How emotion works

AN ERA OF SOCIAL OVERLOADED

Our emotions come from and are based on evolutionary history. They appear in the form of a feedback loop in the organism, trying to restore balance after being stimulated.

The development of modern civilization has made mankind more and more separated from its natural attributes. Pollution, fast-paced life, tension, unprecedented huge amount of information, complicated social relations, changes in work and rest methods have increased, which gradually increase and worsen psychological problems.

Global Burden of Disease Study

3721.764 /100k people

Anxiety

3461.25

Depression

1405.937

Alcohol use disorder

932.4609

Drug use disorder

596.1596

Bipolar disorder

258.844

Schizophrenia

Eating disorder

206.8157

数据来源: IHME, Global Burden of Disease Study, 2017; 新京报网

HOW TO EVALUATE EMOTION

German psychologist Wilhelm Wundt described emotions as joyful or unpleasant (called hedonic or regular Valence), a "simple feeling" that evokes or obeyed (called arousal Arousal), and strain and relaxation (corresponding to intensity).

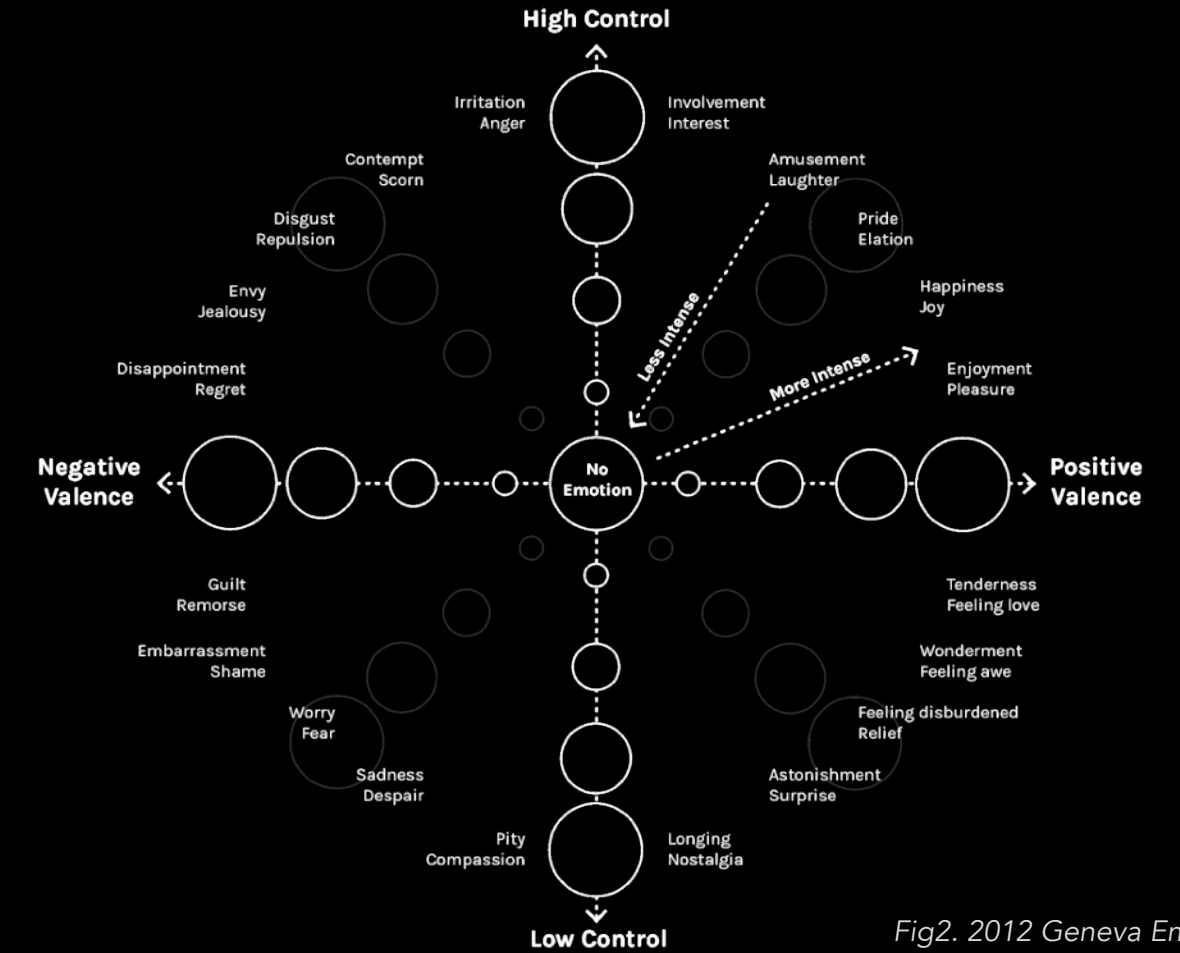
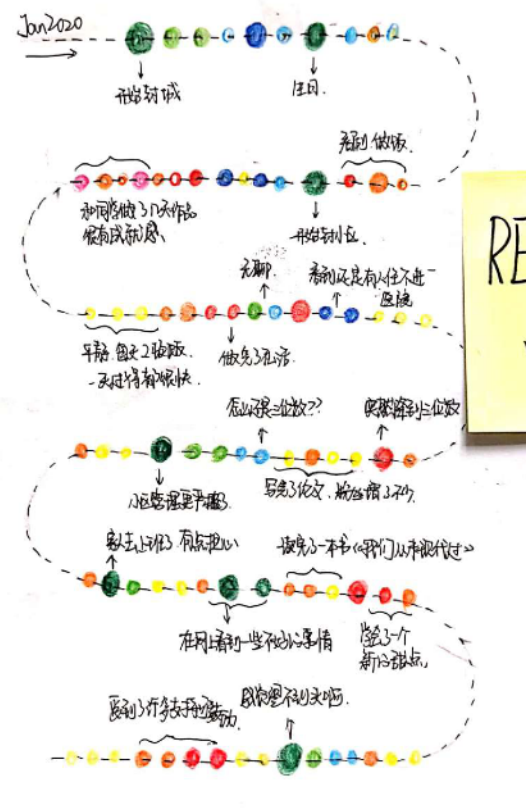
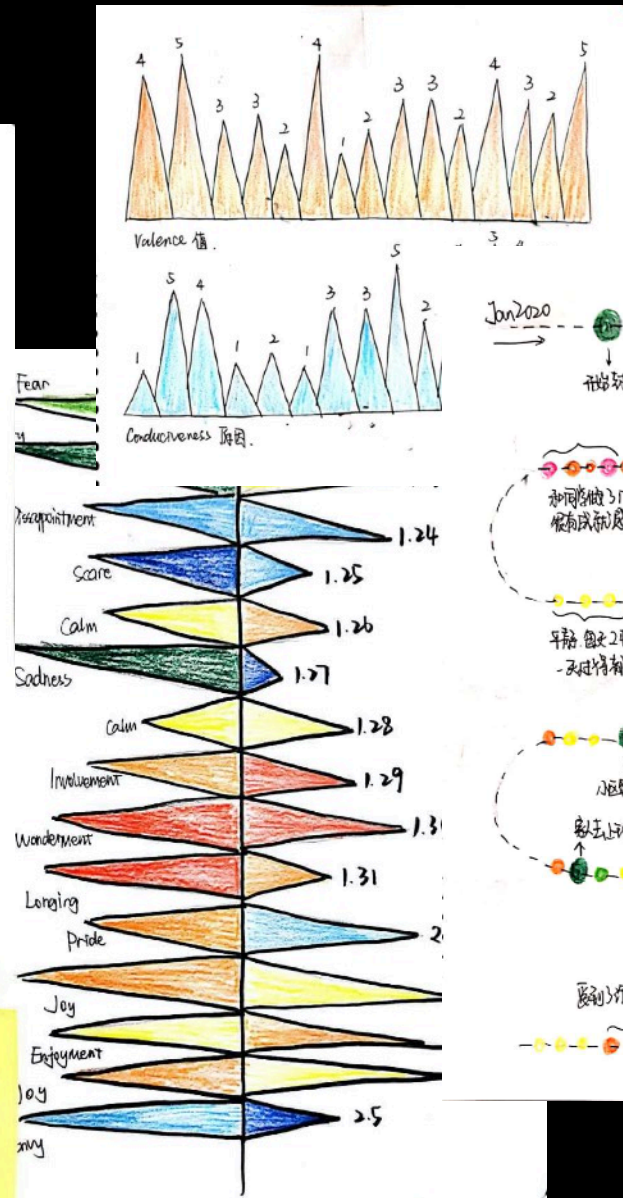
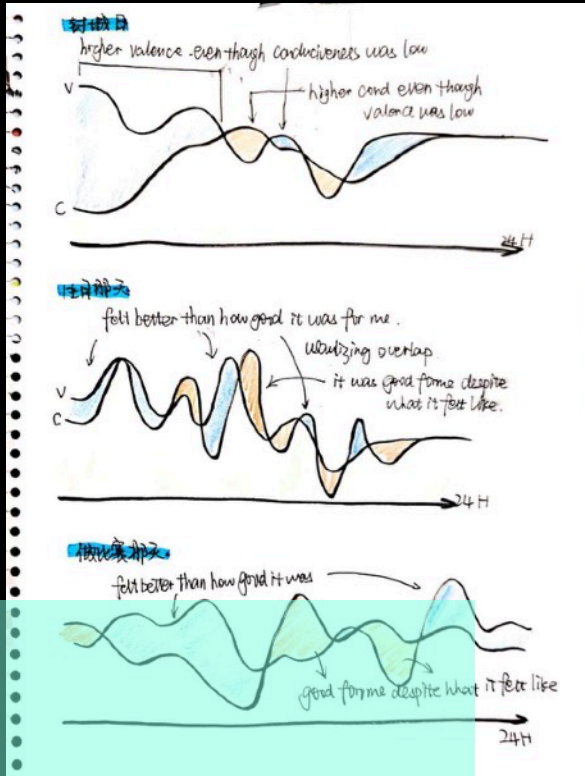


Fig2. 2012 Geneva Emotion Wheel

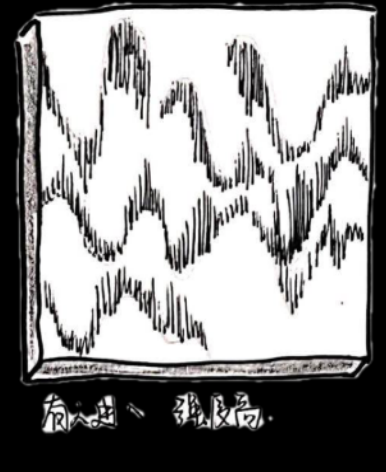
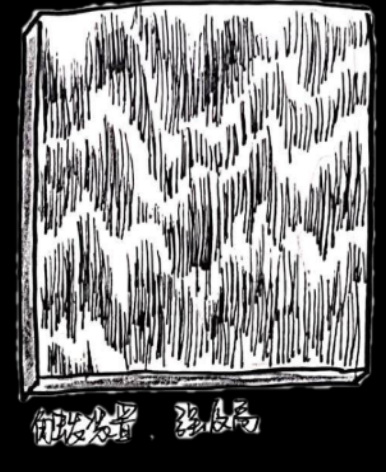
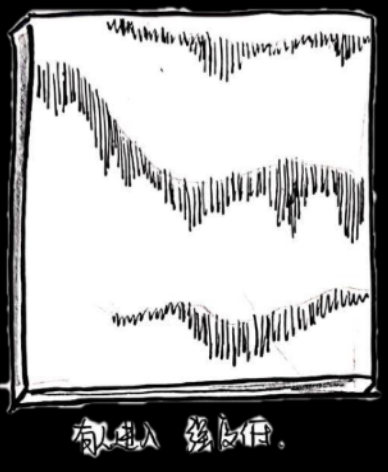
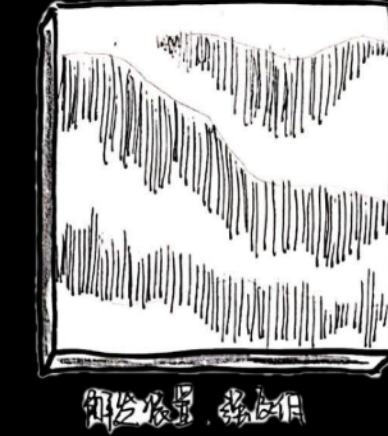
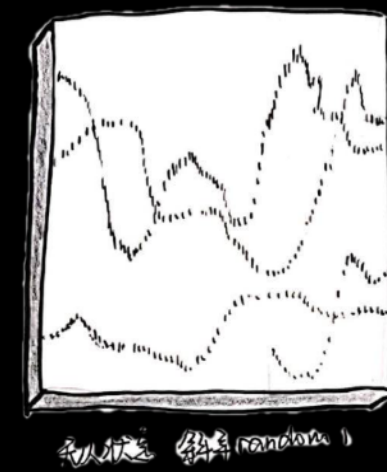
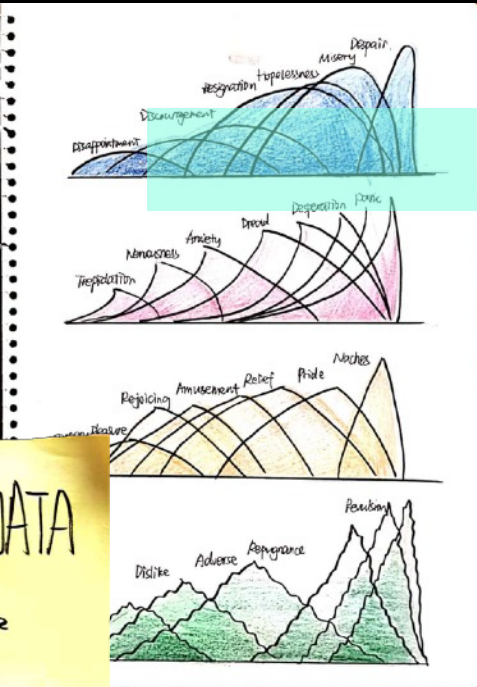
VISUALIZATION



REAL DATA
Valence

READABLE EMOTION

Based on the Geneva Emotion Wheel's definition emotions, I recorded the my emotion everyday in several forms. The recorded content includes five dimensions: text, intensity, valance, conduciveness, control, and arousal.



EMOTION VISUALIZATION

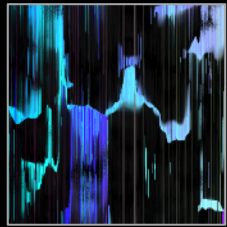
I presented several visualization solutions in user test, asking how they felt about color, height, frequency and emotional performance. The results showed that users think that the height of curve is more related to the intensity of emotions, color is more related to valence

Fig3. Visualization sketch

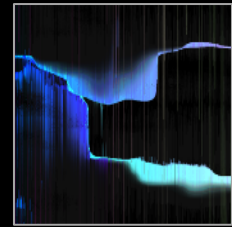
MAPPING

Control

Frequency



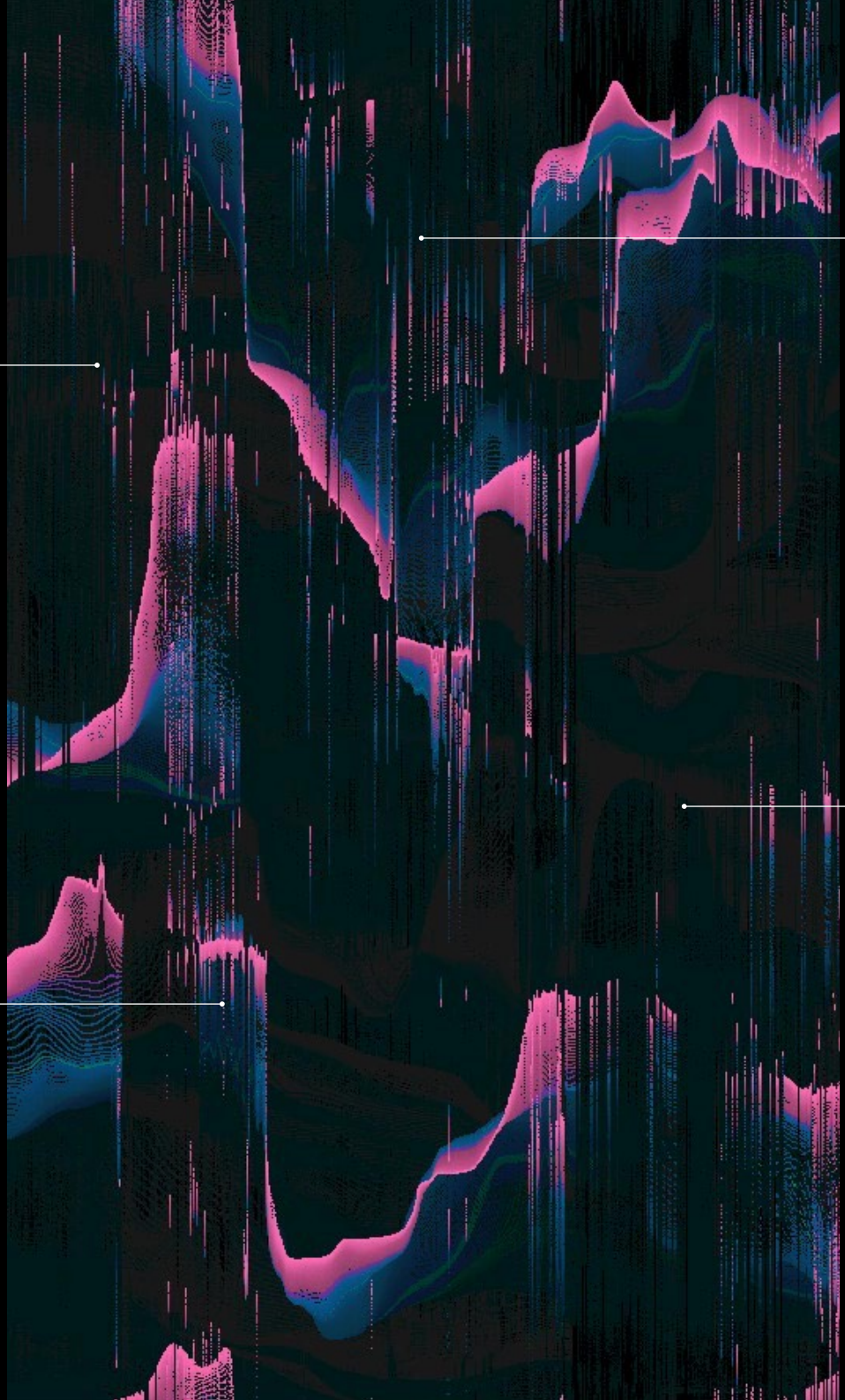
High Control



Low Control

Arousal

Particle Velocity



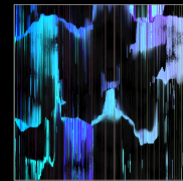
Valence

Color

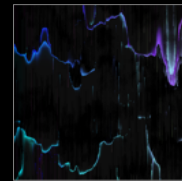
- High Valence (Red)
- Low Valence (Blue)

Intensity

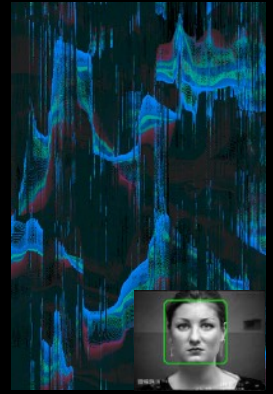
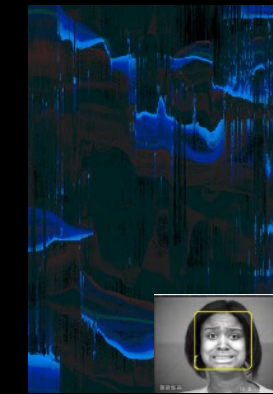
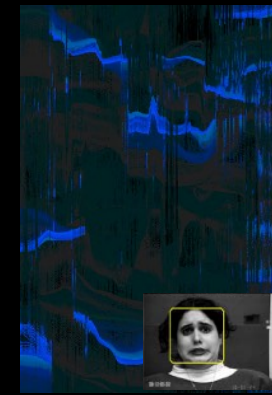
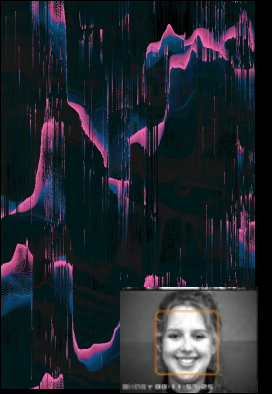
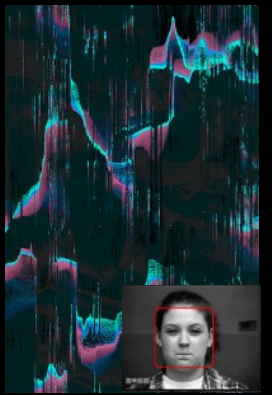
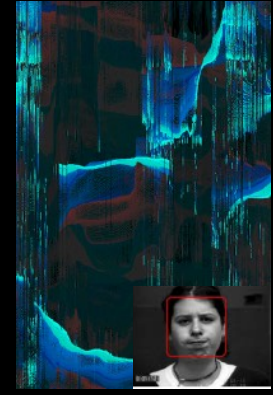
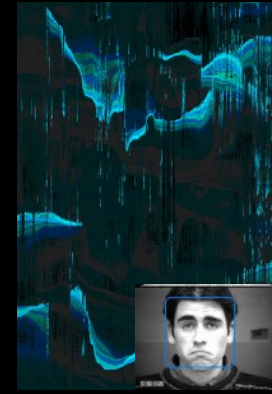
Particle number



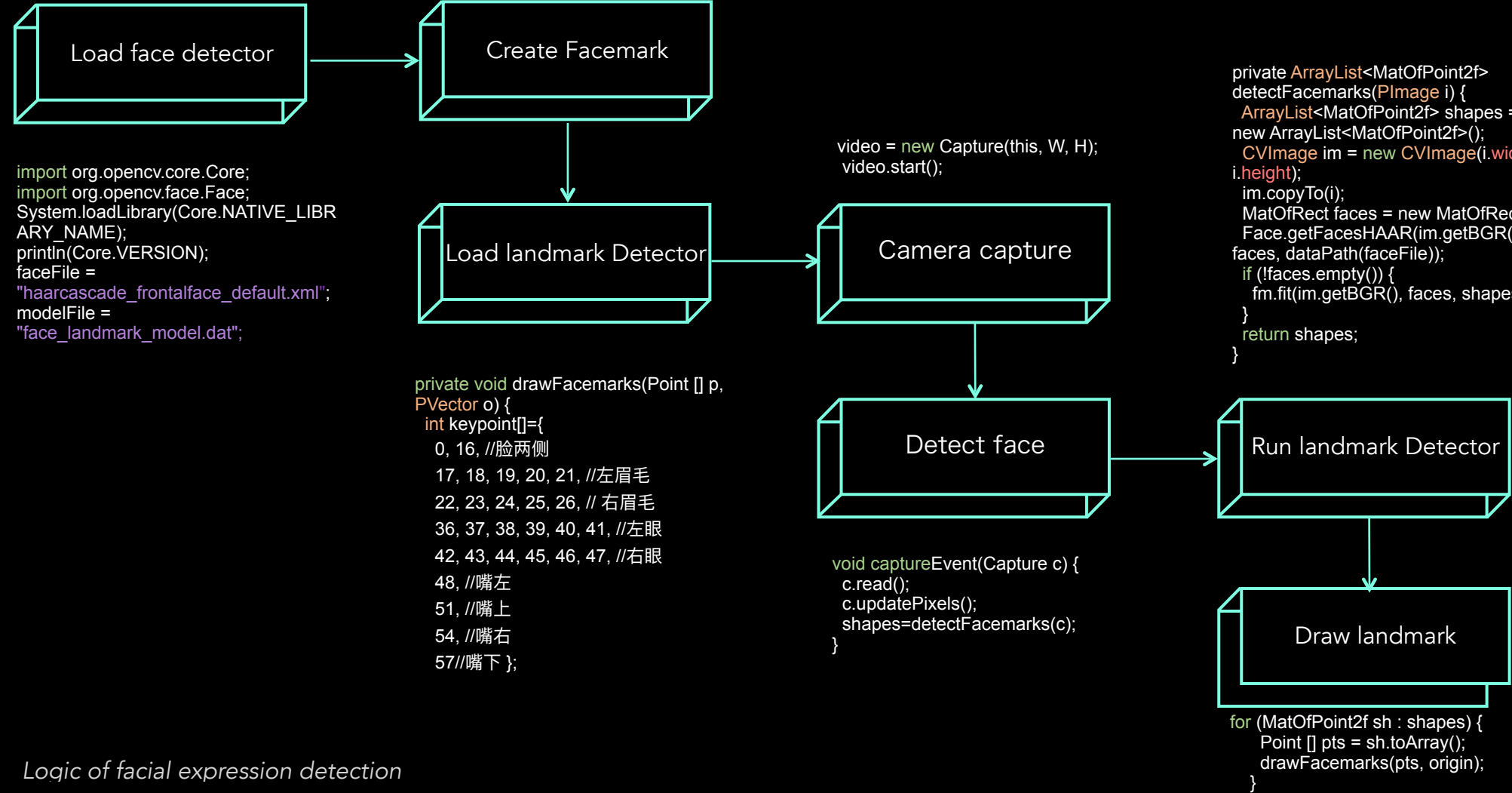
High Intensity



Low Intensity



CODING



Logic of facial expression detection

```

Emotion003 Face
void setParticles() {
particles = new ArrayList<Particle>();
for (int i = 0; i < particles.size(); i++) {
float x = random(0, width);
float y = random(0, height);
Particle p = new Particle(x, y);
particles.add(p);
}
}

class Particle {
float posX, posY;
float angle;
float speed;
float amount;

Particle(float posX, float posY) {
this.posX = posX;
this.posY = posY;
this.angle = random(0, 360);
this.speed = random(0.1, 0.3);
this.amount = random(0.09, 0.14);
}

void update() {
angle += angle * speed;
posX += speed * cos(angle);
posY += speed * sin(angle);
amount *= amount;
}

void display() {
fill(0, 0, width, height);
stroke(255, 0, 0);
strokeWidth(1);
}

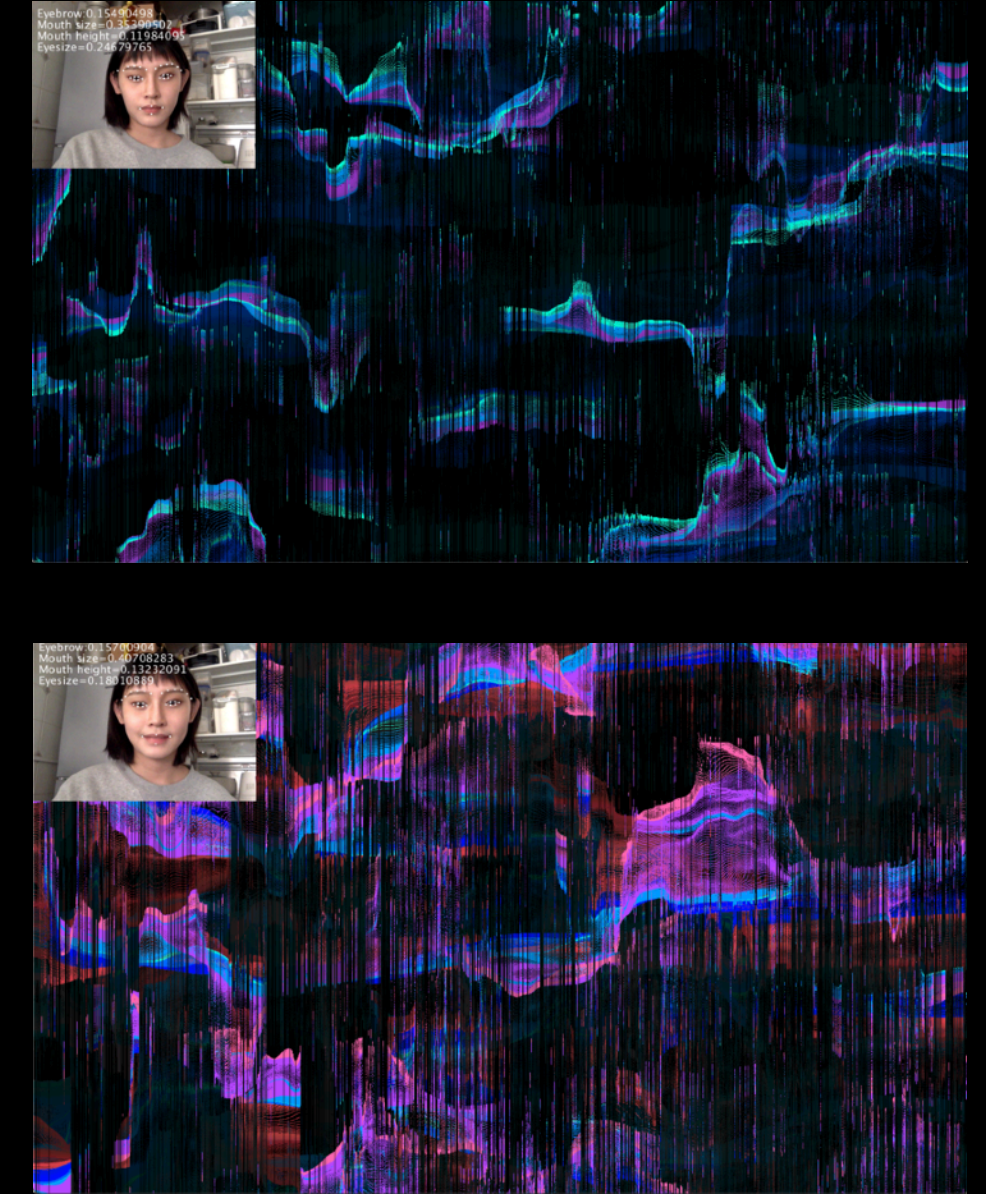
void wrap() {
if (posX < 0) posX = width;
if (posX > width) posX = 0;
if (posY < 0) posY = height;
if (posY > height) posY = 0;
}
}

void setup() {
size(600, 900);
background(0);
noStroke();
setParticles();
FaceSetup();
}

void draw() {
//setParticles();
frameRate(30);
float eyes = constrain(eyesize, 0.16, 0.3);
alpha = map(eyes, 0.2, 0.36, 0, 8);
fill(0, alpha);
rect(0, 0, width, height);
float sp=constrain(mouthheight, 0.1, 0.3);
speed=map(sp, 0.1, 0.3, 1.5, 2.5);
float am=constrain(eyebrow, 0.09, 0.14);
amount =map(am, 0.09, 0.14, 0.8, 2);
loadPixels();
}

private void drawFacemarks(Point [] p, PVector o) {
ArrayList<MatOfPoint2f> shapes =
new ArrayList<MatOfPoint2f>();
CVImage im = new CVImage(i.width,
i.height);
im.copyTo(i);
MatOfRect faces = new MatOfRect();
Face.getFacesHAAR(im.getBGR(),
faces, dataPath(faceFile));
if (!faces.empty()) {
fm.fit(im.getBGR(), faces, shapes);
}
return shapes;
}
    
```

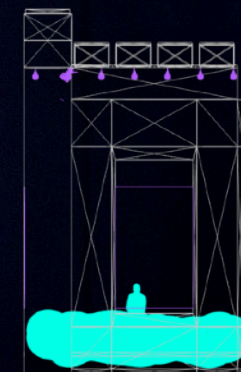
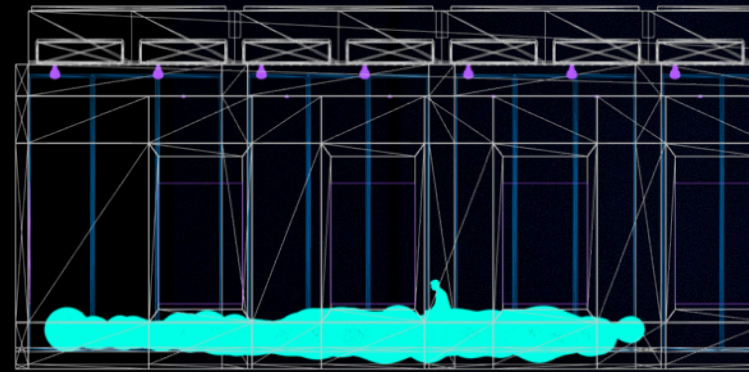
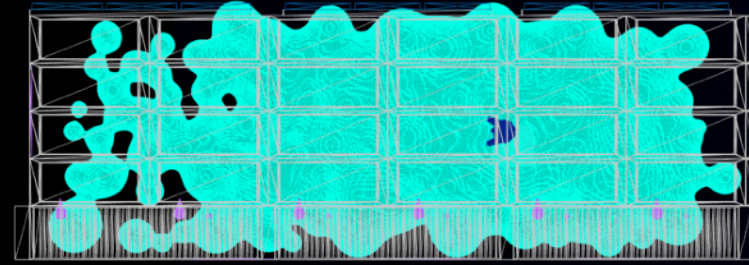
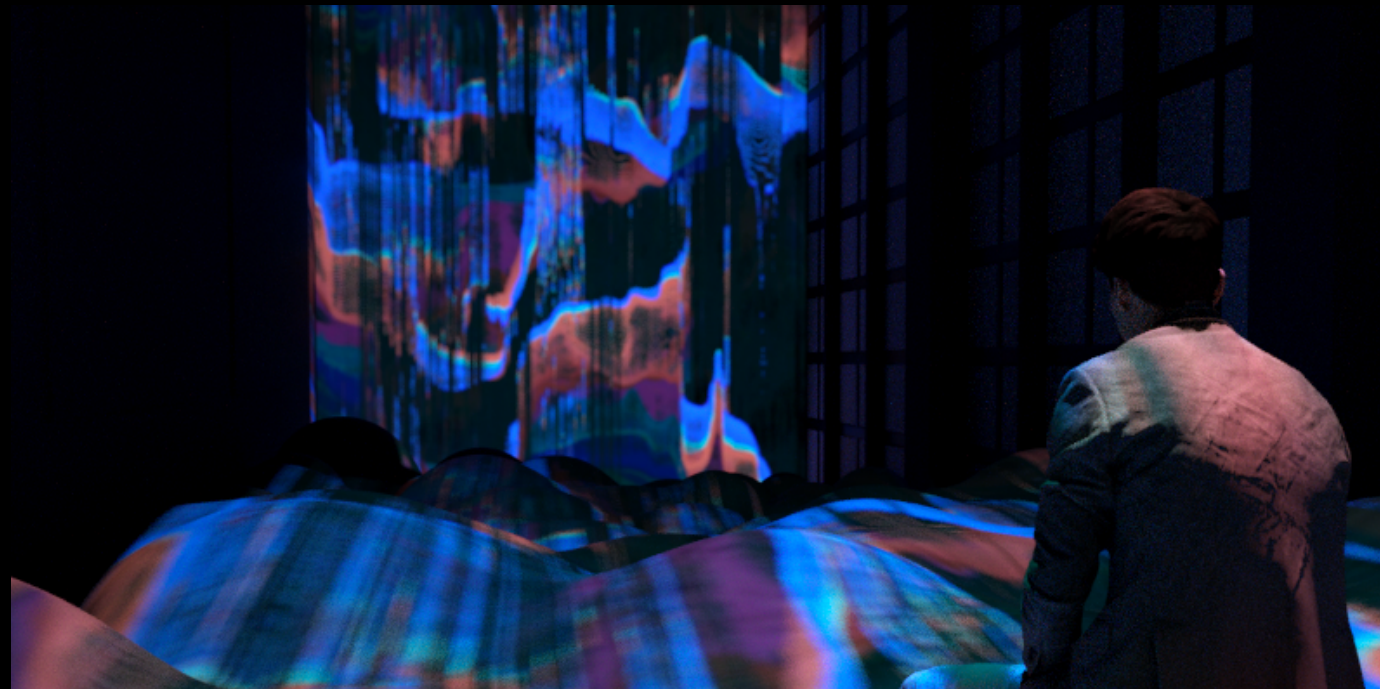
Processing coding



Demo Screenshot

METAPHOR FOR EMOTION

We are accustomed to living in man-made objects filled with planes and straight lines. Because of this, we have forgotten the essence of emotions — flowing like natural objects. The work restores the rugged pavement in the landscape jungle, aiming to remind us the emotions we have forgotten, so that we can have more perception of emotions.

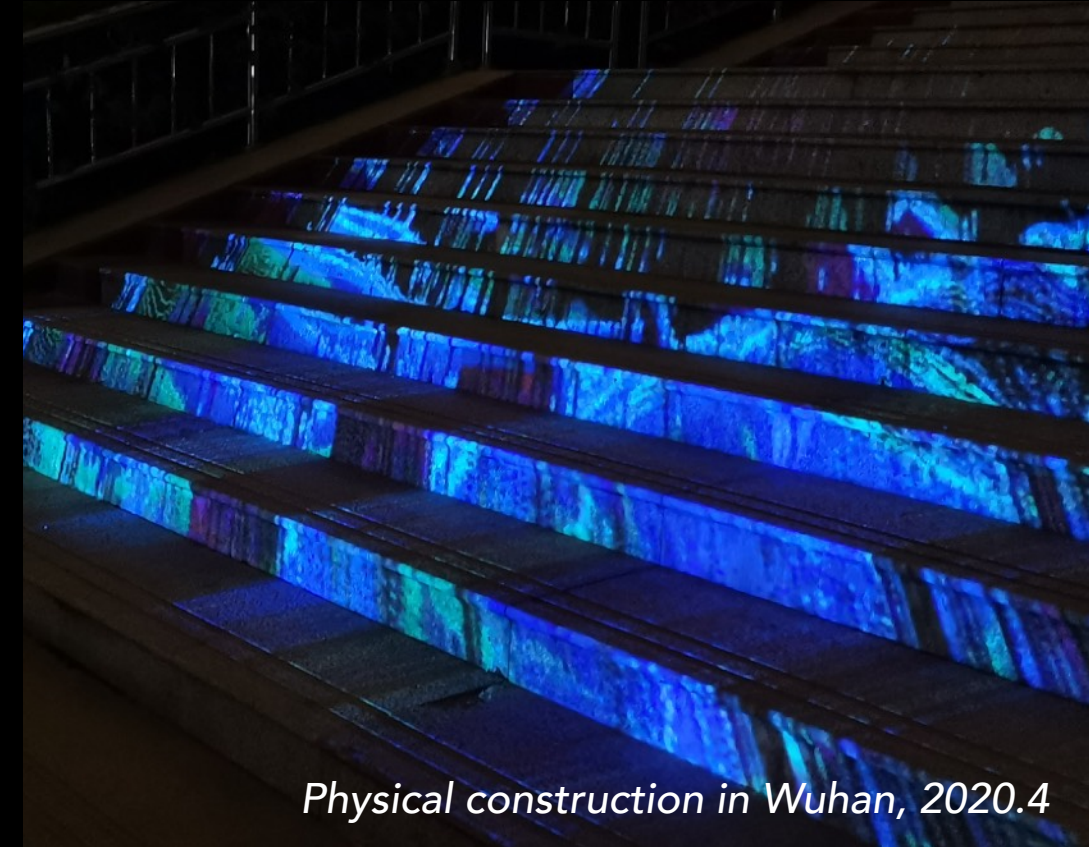
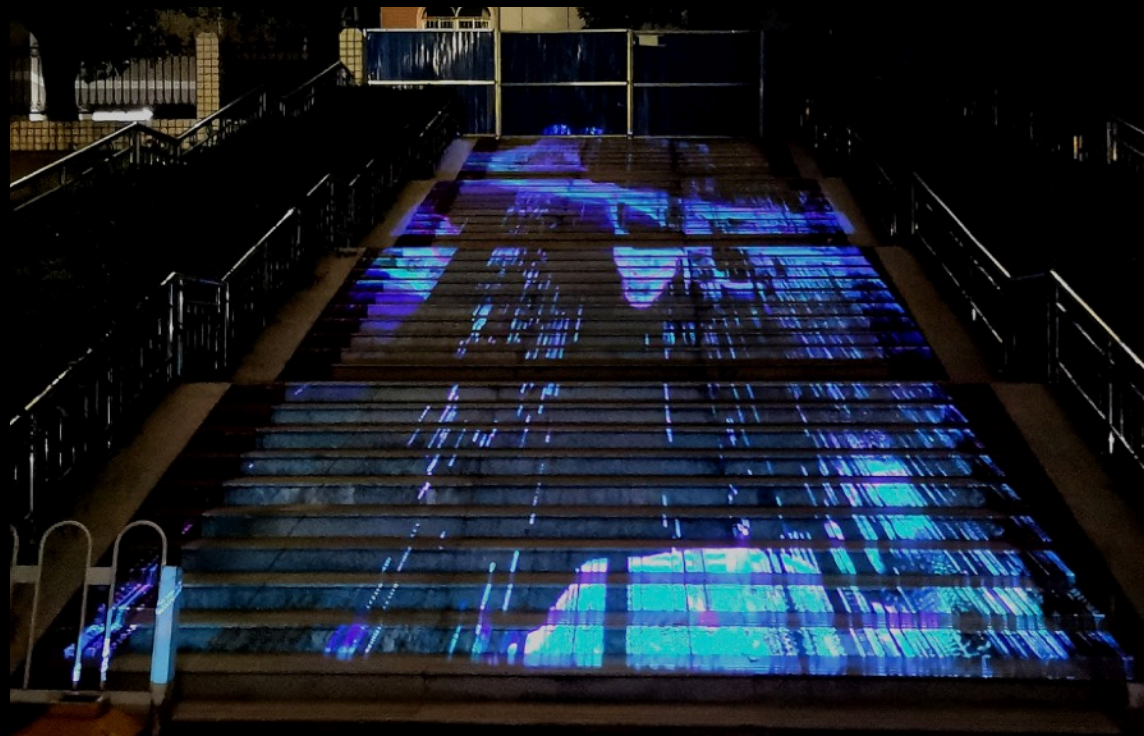


SHAN SHUI

Entering the Shan Shui space composed of emotional particles, let the body fall into the soft fabric. The space itself will constantly be affected by human emotion and body.



EXHIBITION EXPERIENCE



Physical construction in Wuhan, 2020.4



'Reproduce' Art Seminar, Shanghai
Collaboration with performing artist: Qin Ran, 2020.9



'Reproduce' Art Seminar, Shanghai
A girl interact with the installation, 2020.9



Feature lecturer, Suzhou Design Week
Invited by Aric Chen

