

On October 25, 2018, the first AI-drawn painting "Edmond de Belamy" was sold at Christie's New York auction house at a high price of **US \$ 432,500**. "Edmond de Belamy" is an AI-painted painting, which was completed by the Paris art group "Obvious" using algorithms, based on 15,000 classic portraits from the 14th to the 20th century.

A painting by

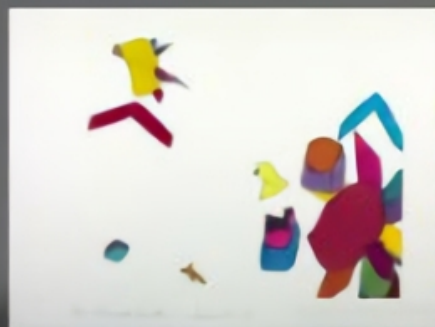
$$\min \max E_x[\log(D(x))] + E_z[\log(1-D(G(z)))]$$

Is this art?



Edmond de Belamy

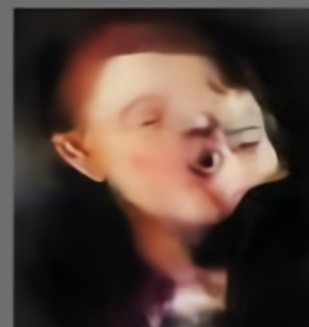
Development of AI art



Late 1950s: Generative Art

Generative art is a type of computer-based art. Using pre-defined systems, such as language rules, the art of making.

by Harold Cohen, 1982



2014 Lan Goodfellow Gan

Lan Goodfellow first developed GAN, which is an amazing breakthrough in image generation by neural networks.

by Mario Klingemann



2015 Google Deep Dream

DeepDream helps us better understand how deep learning works, and it can also generate some strange and artistic images.

by Google, 2016



Rutgers University AICAN

It tries to learn the aesthetics of existing works of art. If it imitate the established style too much, and it will be punished.

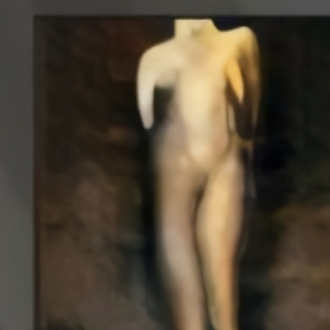
by AICAN



2017 Tom White Perception Engines

He set a set of initial parameters for the perception engine, including color, line thickness, etc., and selected the output.

by Tom White, 2017



2018 Robbie Barrat Gan

Using a series of nude portraits, train GANs in a progressively increasing manner, trying to get it to generate their own nude portraits.

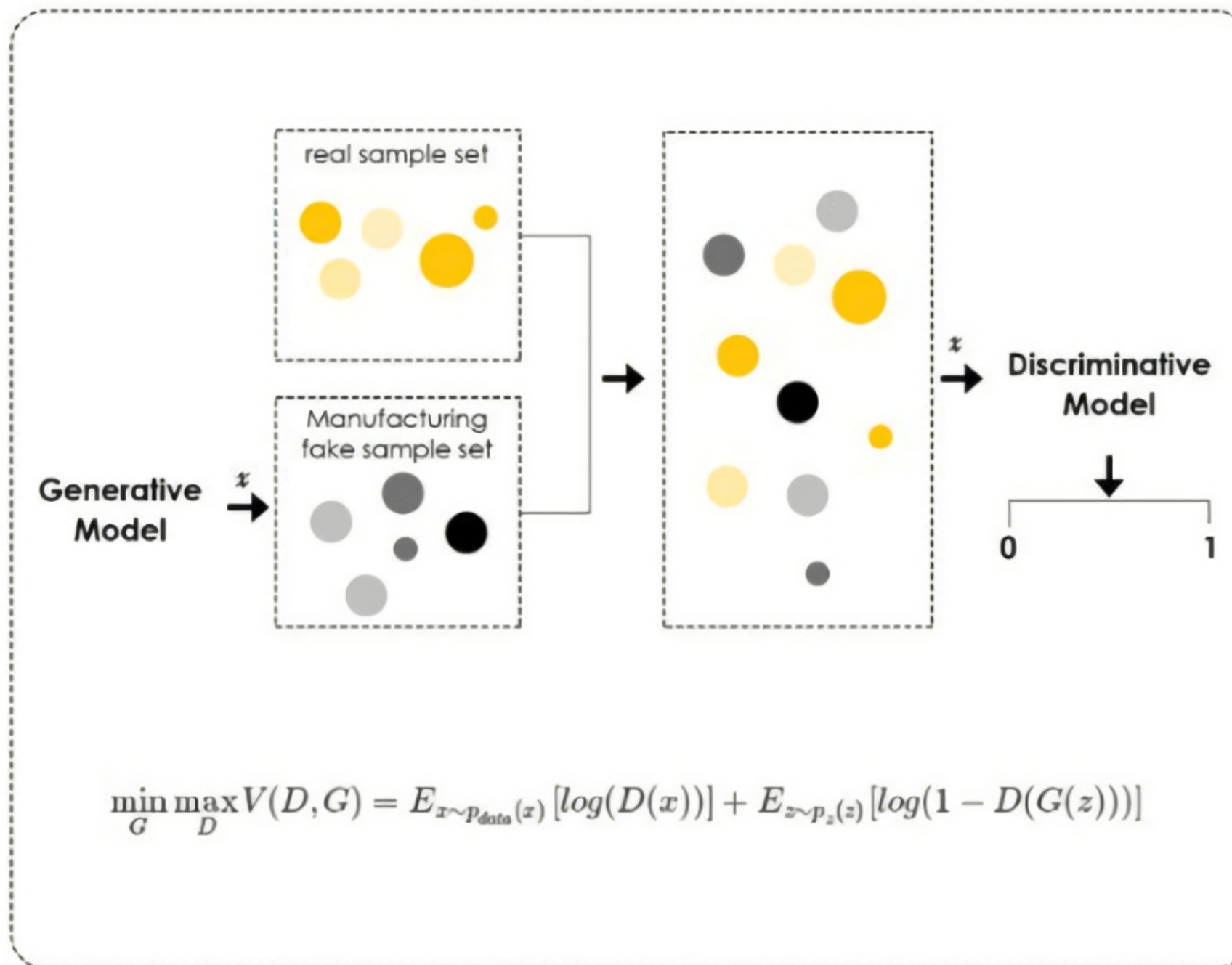
by Robbie Barrat, 2018

2 ALGORITHM PRINCIPLE

How does AI "draw" a painting?

Generative Adversarial Networks

- The generative model is given some implicit information to randomly generate observation data.
- The discriminant model requires an input variable, which is predicted by a certain model.



Objective: Make the discriminator unable to judge, the output result probability is 0.5 for both true and false samples.



How different people think about AI art?



Founder of Transfer gallery

Kelani Nichole

People who grew up and became rich in the **digital age** have different perspectives on material scarcity, transparency, and ownership. The **experience** of artistic works may be more important than the real thing.

Liu Xingshuo

Art student



I feel that this is still the category of **human art**. People have compiled algorithms and algorithms have output works. The most important artistic value in contemporary art is "**concepts**". If the works can reflect the artist's activities and innovations in **ideas and thoughts**, the higher the artistic value.

He Wei



Chinese painter

I think it's the **craftsmanship** that will be the most **determinant** thing in why AI art is interesting in the future.

I acknowledge that AI's thinking can be **independent and autonomous**, so AI can achieve conceptual innovation through independent thinking, and create artistic works based on concepts.



Programmer

Wang Deming

The works created by AI or machines are specific products of the times. They are a product of human science and technology. It may cover the more comprehensive artistic expressions and methods of human beings, but does not have unique human creation **Original spirit** and **human emotional temperature**.

Hugo Caselles-Dupré

Artificial intelligence expert of Obvious

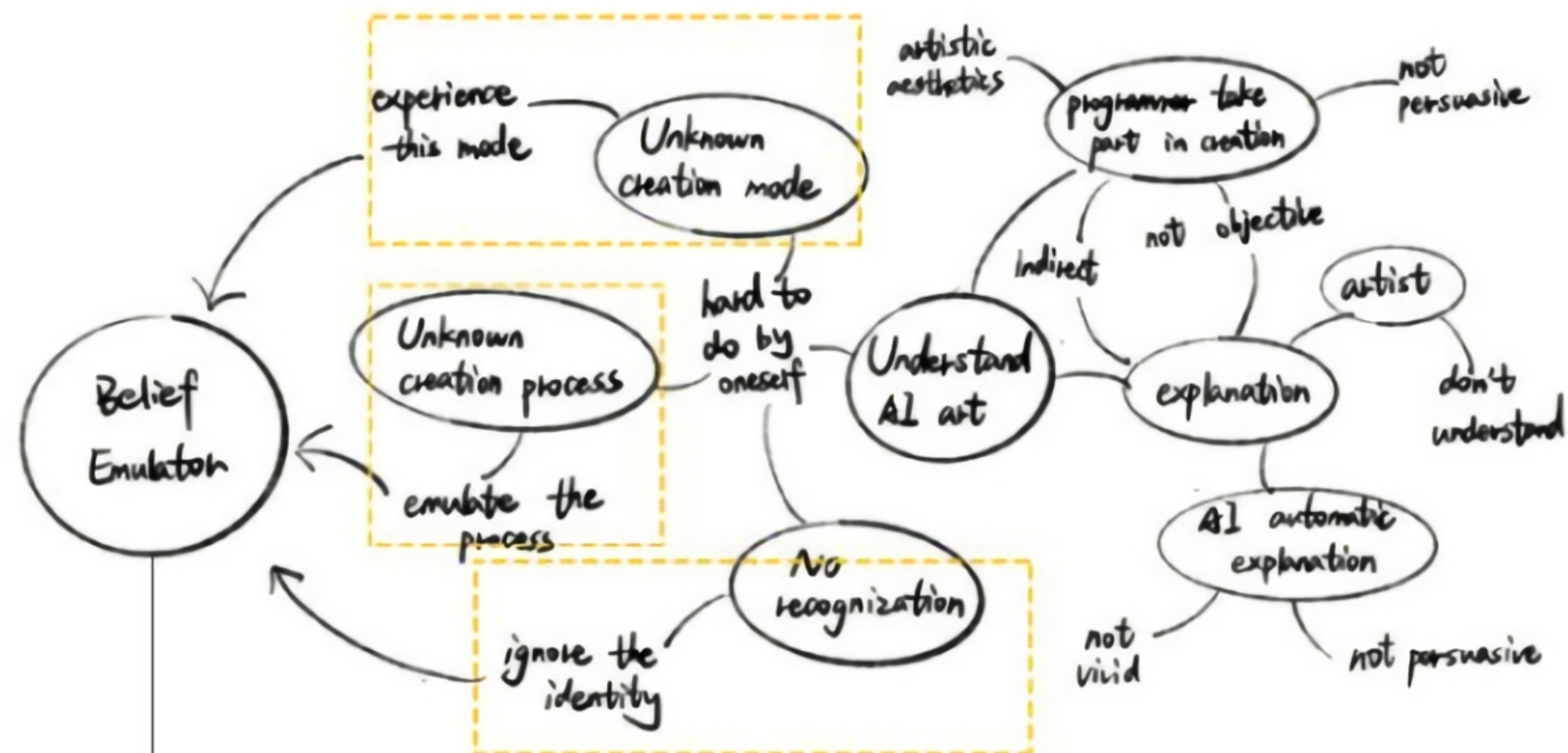


/concept /
/emotion /
/experience/

How to
help people
understand
AI art?

4 BRAINSTORMING

How to help people understand AI art?



Visualize the creative process and visualize machine emotions.

1 Unknown about the way AI create work

experience this way ✓

2 Not involved in stories behind AI creation

watch a story ✓

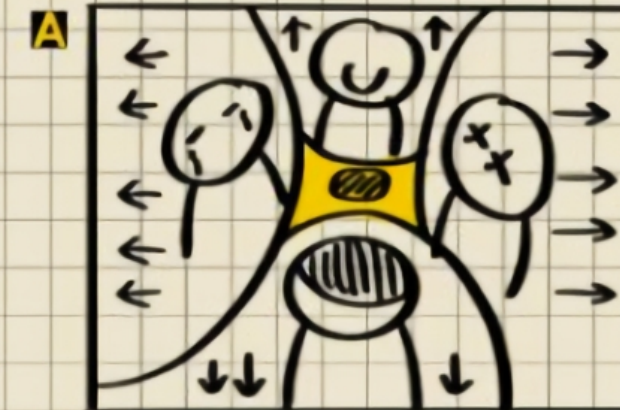
3 Do not recognize the identity of AI

ignore this identity ✓

5 STORYBOARD

The process people get to understand AI art

Individual space



According to the attributes and values of different people, his own **emotion space** is generated. In this space, her emotion can be extracted and calculated.

Emotional video



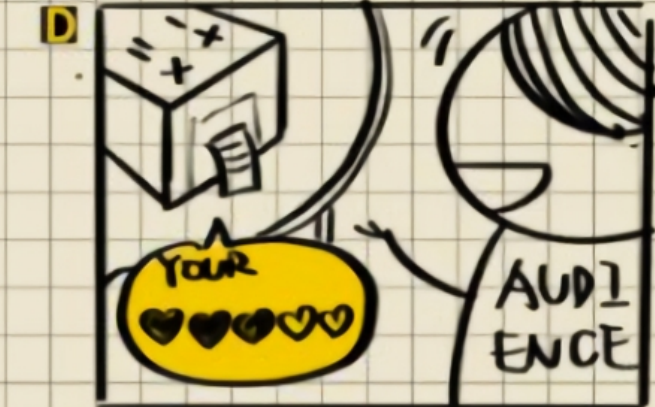
Combining the audience's emotional space with the **creative data** of the AI works, a section of images is generated.

Sentiment extraction



When watching the video, the viewer's emotional information in the space will be **extracted and analyzed**.

Evaluation calculation



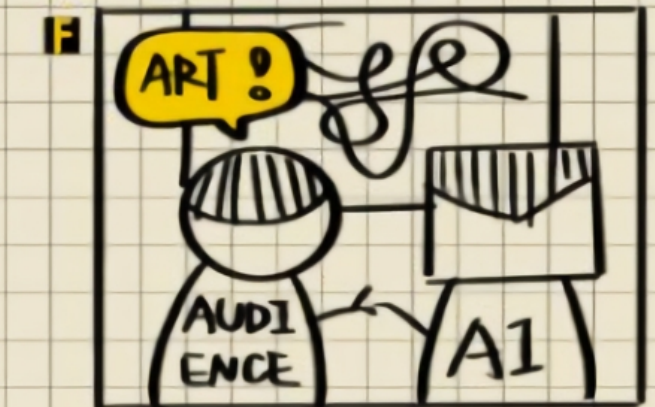
After the viewing, the audience's **evaluation** of the AI art is also calculated, and the audience can **get feedback**.

Visualization



In addition to the evaluations displayed on the print bar, the viewer can also scan the **QR code** on the print bar to view the image.

Creative participation



At the same time, the emotional fluctuations extracted by the audience are **visualized** into another image, which is an art created by the audience and AI.

**Identity characteristics**

The recognition process should be fast and simple, and not make the audience feel uncomfortable or privacy is violated.

**Generate image**

The generated image should not be too long, so that the audience has enough patience to watch it.

**Recognize emotion**

Emotion information can be extracted by facial emotion recognition, heartbeat recognition, brain wave recognition and other means.

**Include emotion**

The extracted information should be sent to the processor by a special sensor for analysis and processing.

**Algorithm evaluation**

The sensor should be combined with the wearable device settings of the audience.

**Visualization**

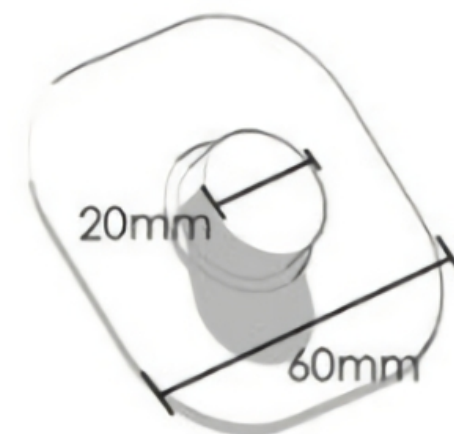
The final result should be portable, which is convenient for the audience to take the feedback as a souvenir.

processor

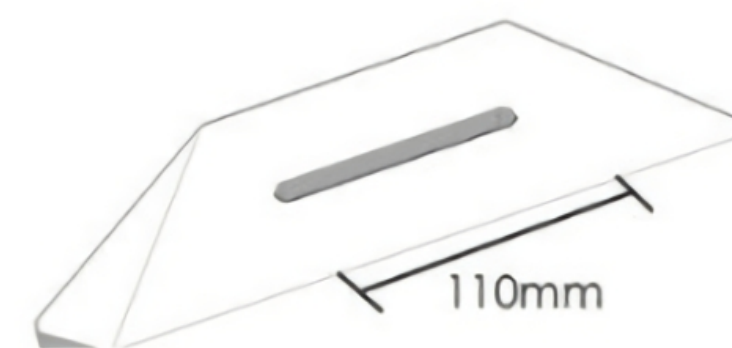
a device used to process data and generate evaluation feedback



emulate button



assess button



paper outlet

sensor

a device used to perceives the data and transmits it to the processor



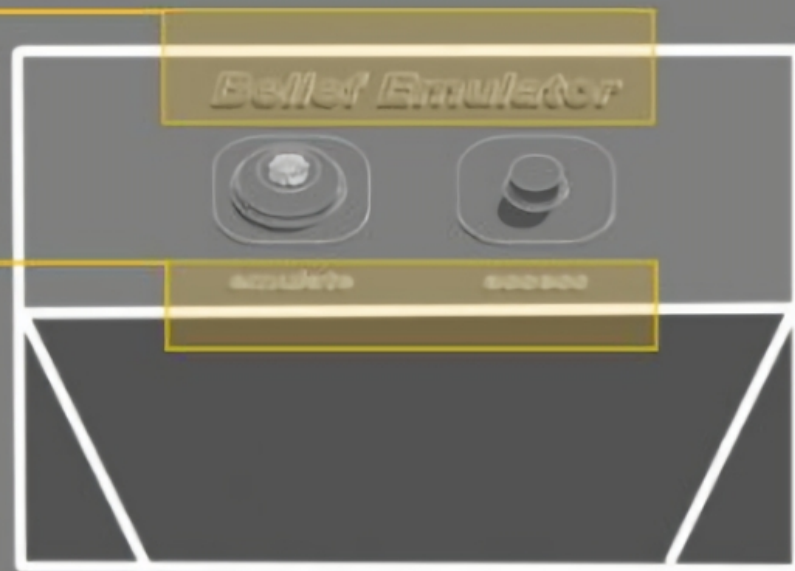
The glasses can both play images and receive perceived audience emotions.

7 DEVICE DESIGN

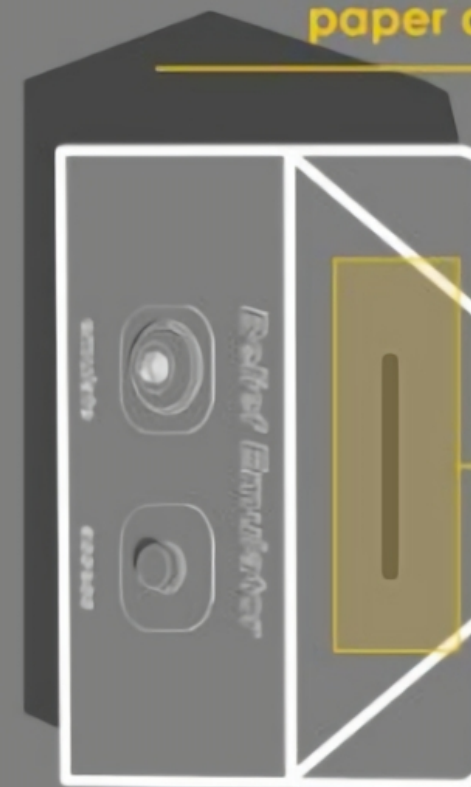
Modeling

logo

Label device name and
button name



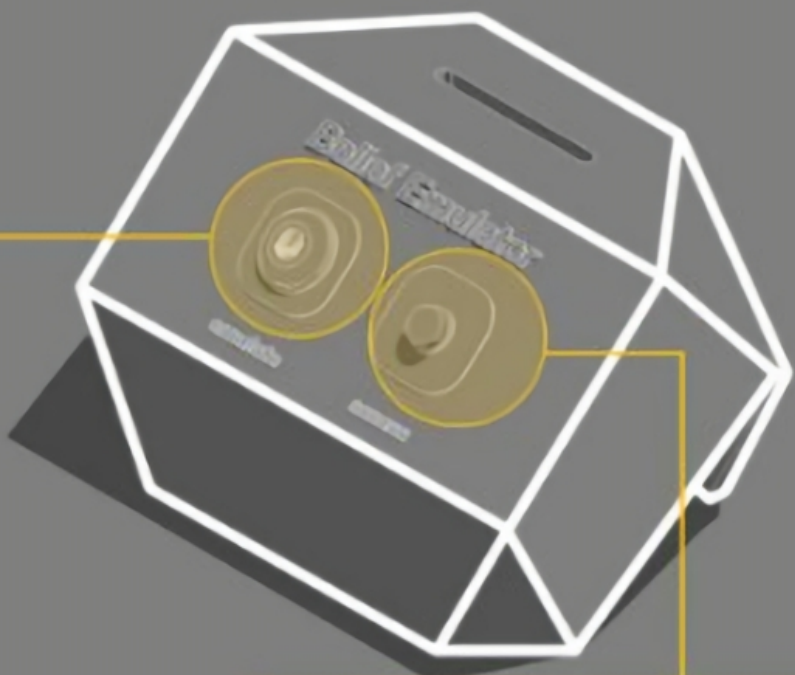
paper outlet



Print a note
containing reviews
and visual
information

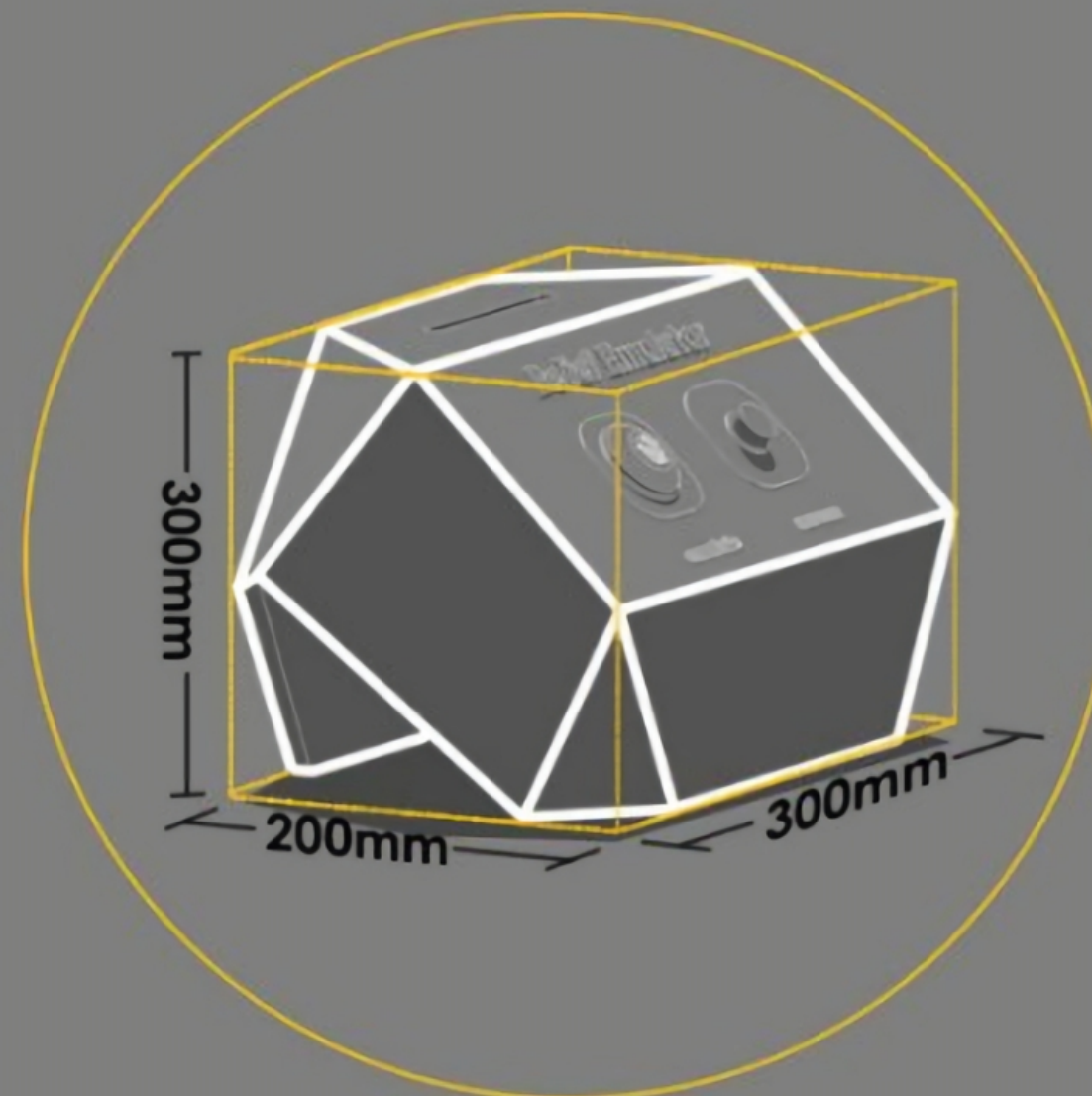
Press to automatically
generate images

emulate button

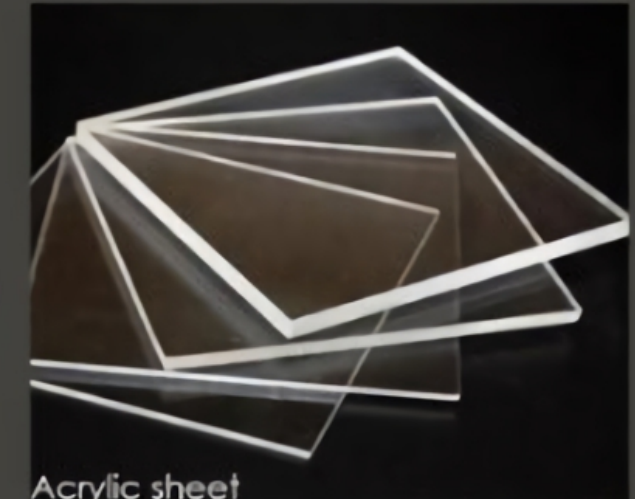


assess button

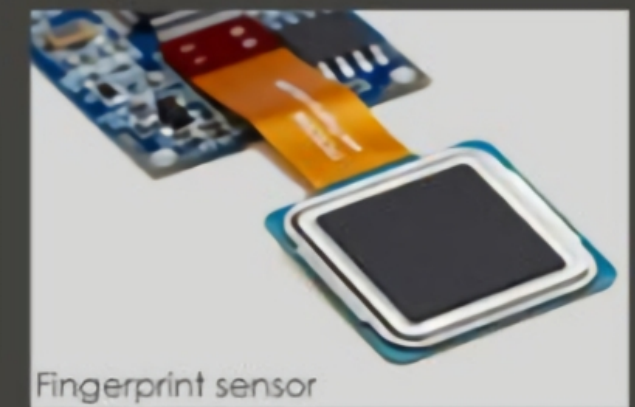
Press to get evaluation receipt



Chevron board



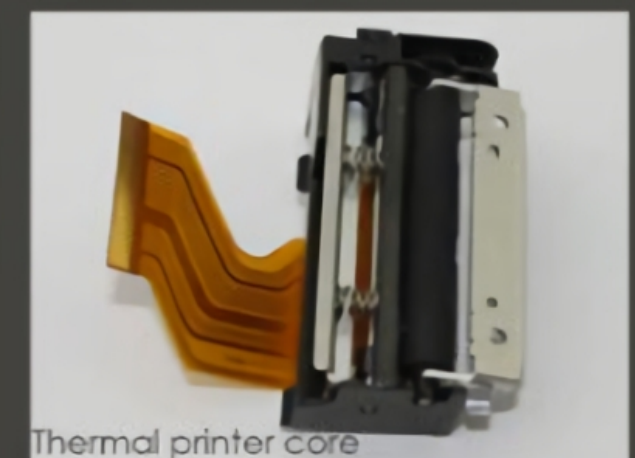
Acrylic sheet



Fingerprint sensor



Raspberry pie



Thermal printer core



emulate an emotional story,
let algorithms judge

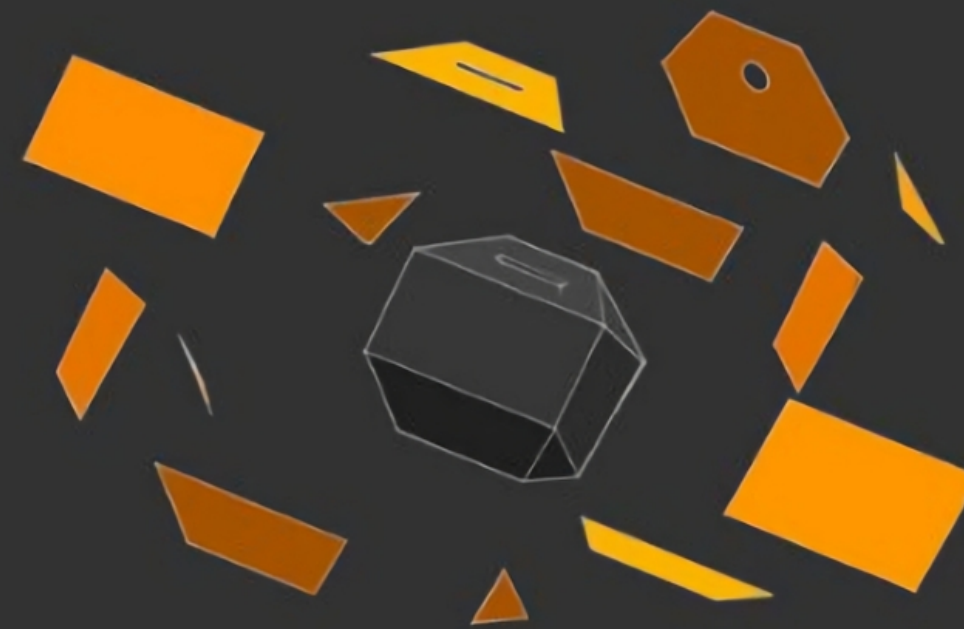
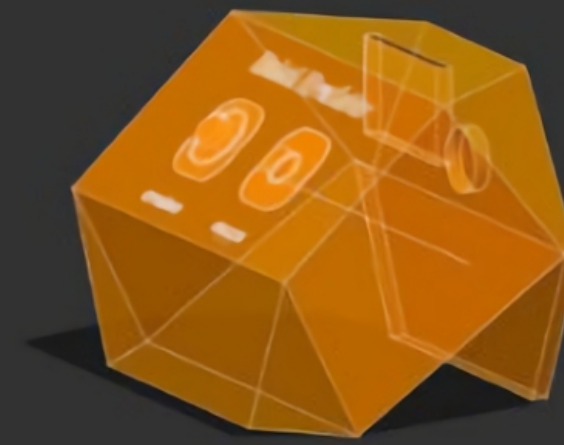
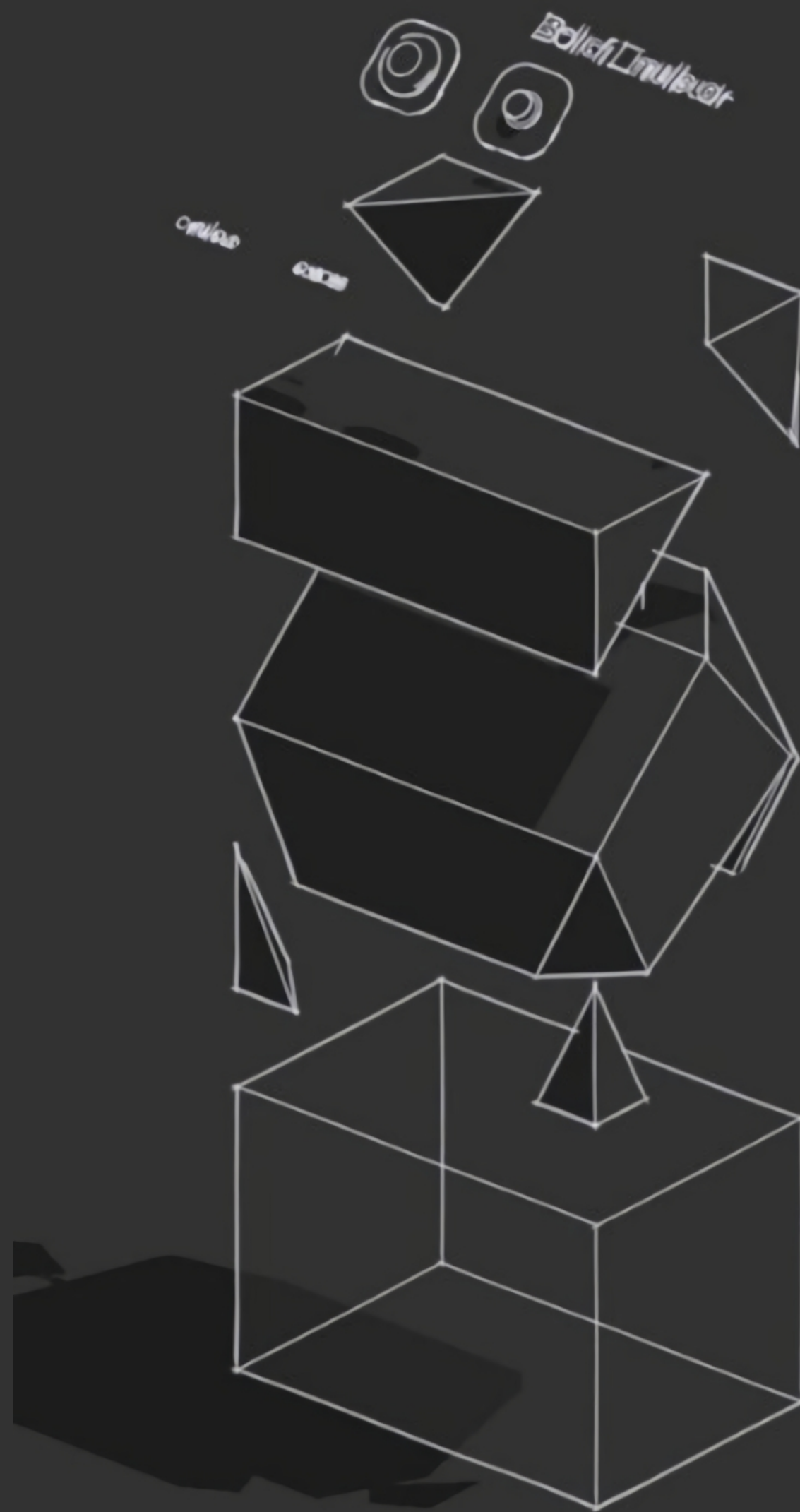
IV PUSH THE ASSESS BUTTON

At the push of a button, the Belief Emulator will calculate the audience sentiment data collected.



OUTPUT PRINT V

Subsequently, the evaluation receipt was printed, and the believe emulator gave the audience evaluation of the painting. At the same time, the audience can scan the barcode on the printpaper to watch an AI art video generated from their emotional data just during the emulating process. .



EMULATING

III EMULATE AND WATCH THE EMULATING VIDEO

When watching the image, the audience's emotional information is extracted and calculated. Finally, the believe emulator helps the audience make value judgment. At the same time, the audience's emotional changes will create a visual image, that is, the audience participates in AI creation from a certain level.



1. The background image is a historical painting of an art studio. It features a large arched window with multiple panes, through which bright light enters the room. Several people in period clothing are present: a man in a dark coat stands near an easel on the right, while two women in light-colored dresses sit on a red sofa in the center. The room is filled with art supplies, bookshelves, and a large bust on a pedestal. A small, semi-transparent text box is visible in the upper right area of the painting.



| Parameter | Value | Parameter | Value | Parameter | Value |
|-----------|--------|-----------|--------|-----------|-----------|
| Color | Red | Color | Blue | Color | Green |
| Size | 100 | Size | 200 | Size | 300 |
| Shape | Circle | Shape | Square | Shape | Triangle |
| Position | Center | Position | Left | Position | Right |
| Rotation | 0 | Rotation | 90 | Rotation | 180 |
| Opacity | 0.5 | Opacity | 0.8 | Opacity | 1.0 |
| Stroke | Solid | Stroke | Dashed | Stroke | Dotted |
| Width | 2px | Width | 4px | Width | 6px |
| Height | 2px | Height | 4px | Height | 6px |
| Radius | 50% | Radius | 75% | Radius | 100% |
| Angle | 0 | Angle | 45 | Angle | 90 |
| Length | 100 | Length | 200 | Length | 300 |
| Weight | Normal | Weight | Bold | Weight | Light |
| Font | Arial | Font | Times | Font | Helvetica |
| Size | 12 | Size | 14 | Size | 16 |
| Color | Black | Color | White | Color | Gray |
| Stroke | Solid | Stroke | Dashed | Stroke | Dotted |
| Width | 2px | Width | 4px | Width | 6px |
| Height | 2px | Height | 4px | Height | 6px |
| Radius | 50% | Radius | 75% | Radius | 100% |
| Angle | 0 | Angle | 45 | Angle | 90 |
| Length | 100 | Length | 200 | Length | 300 |
| Weight | Normal | Weight | Bold | Weight | Light |
| Font | Arial | Font | Times | Font | Helvetica |
| Size | 12 | Size | 14 | Size | 16 |
| Color | Black | Color | White | Color | Gray |

