# InterBox

InterBox is an interactive art installation, exploring the perception of self image reflected in a heterotopic mirror interface in different temporalities.

Inspired by the concept of "Heterotopia" from Michel Foucault, I developed a heterotopic mirror interface using a webcam installed inside an acrylic box (15×15cm) mounted on a stand.
Spectators can open and rotate the box to perceive their self portrait transformed using real time image processing to reveal a reconstructed self image.

https://www.wei-fang.com/project/interbox



**TYPE**
Interactive Arts

**YEAR**
2021

**ROLE**
TouchDesigner Programming / Interaction Design / Concept

**TOOLS**
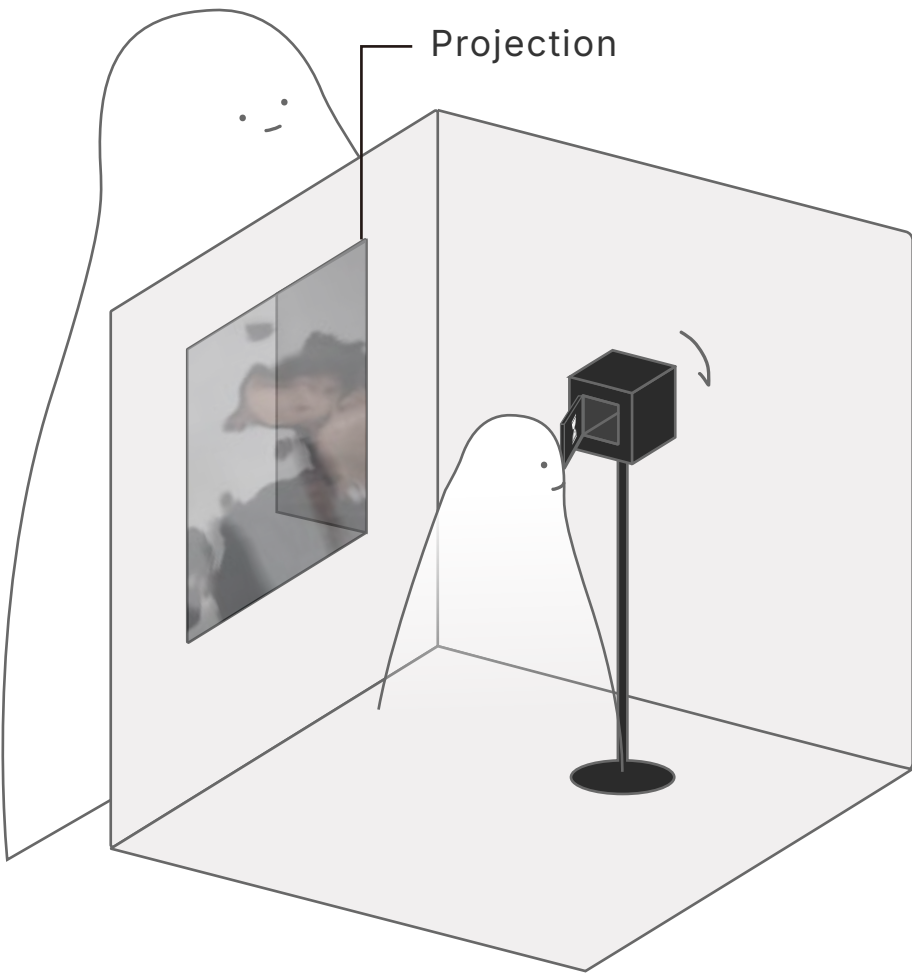TouchDesigner, Arduino, Unity, Cinema 4D
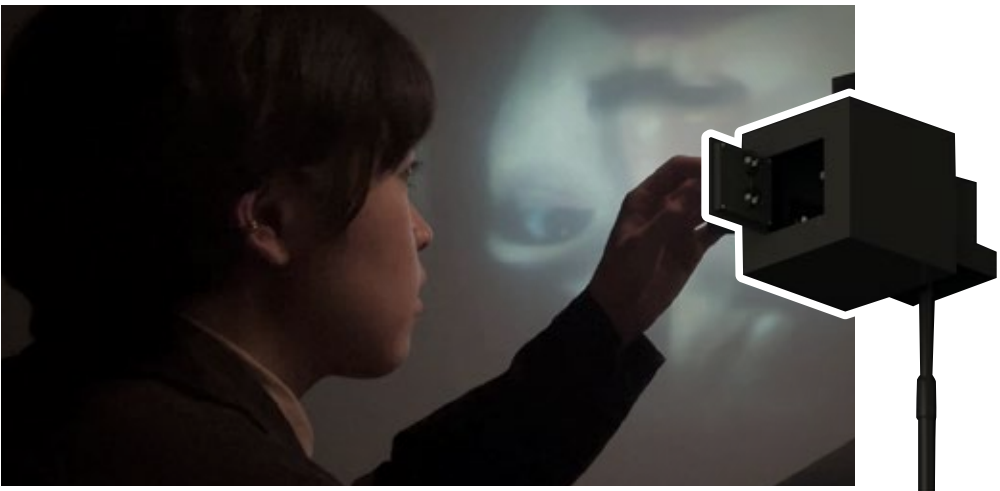
# Interaction Design

## Rotate the Box

When rotating the box, the hourglass turns in real time based on the angle sensor. The hourglass indicates the flow of time, guiding users to rotate the box. Each rotation angle (0°, 180°, 270°, 90°) corresponds to a different temporality: forward, reverse, or stagnant flow.
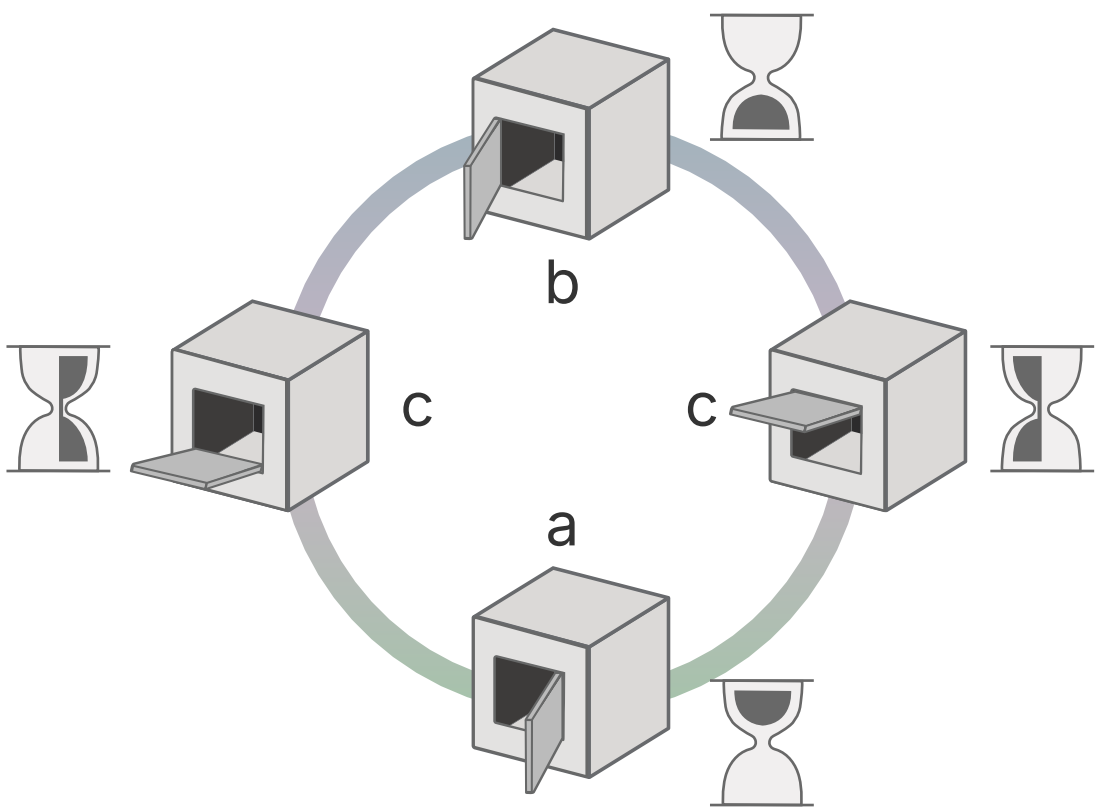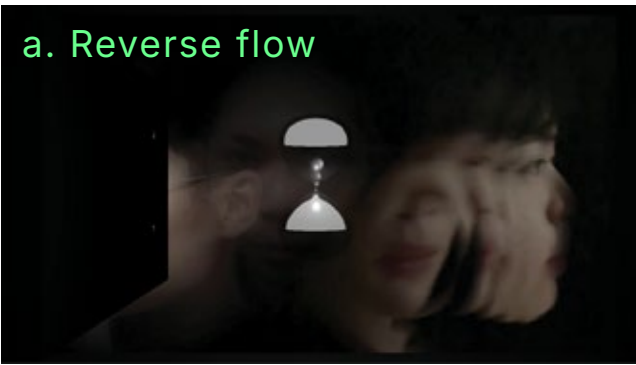


## Open the window

When opening the box, a webcam captures their self-portrait, processed in real time through TouchDesigner and projected onto the wall. When closed, the projection shifts to a 3D hourglass representing elapsed time.
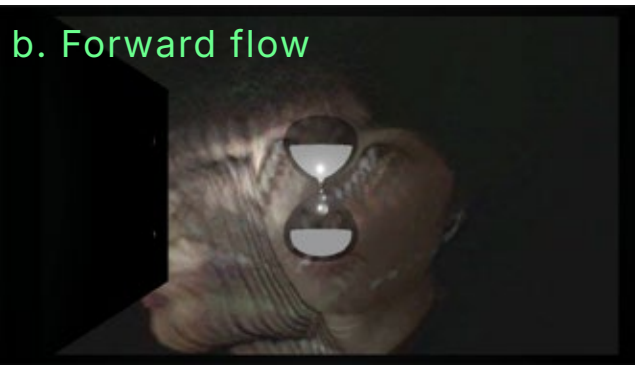




Projection

◄ When experiencers watch into the small box, meanwhile, they are being watched by themselves in the projection, which visualizes time flow by real time image processing.
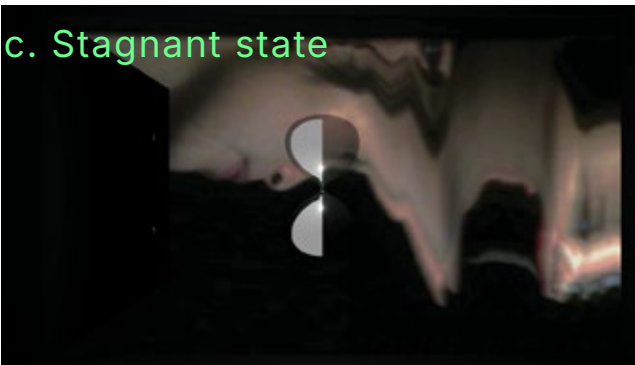


**The angle of box rotation relate to the direction of hourglass and reflect three real-time effects.**



a. Reverse flow

The experiencer's image in present time is dissolved into flashes of images recorded from previous spectators.
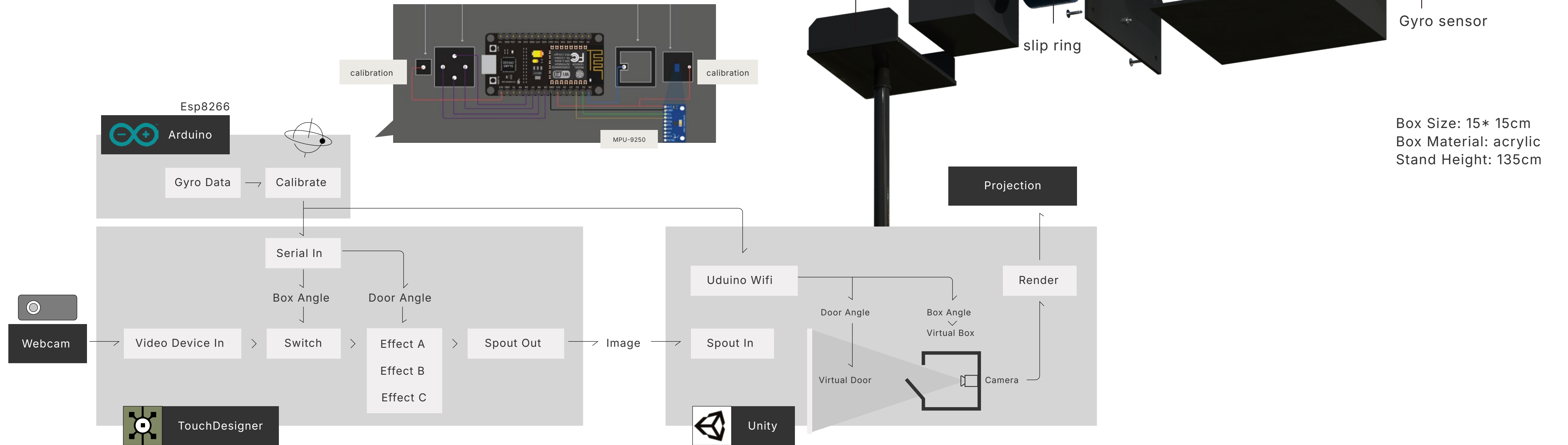


b. Forward flow

Fragments of the self image transform into flowing and overlapping video portraits inspired from sands sinking through the hourglass.



c. Stagnant state

The visual effect of the captured self portrait tries to find the equilibrium between the dynamic flowing video portrait and static self image.

# System Design

calibration

structure

stand

webcam

slip ring

Gyro sensor

calibration

MPU-9250

Box Size: 15 * 15cm
Box Material: acrylic
Stand Height: 135cm

Esp8266

**Arduino**

Gyro Data → Calibrate

Webcam

**TouchDesigner**

Serial In

Box Angle  Door Angle

Video Device In → Switch → Effect A / Effect B / Effect C → Spout Out → Image

Projection

Uduino Wifi

Door Angle   Box Angle / Virtual Box

Render

Spout In

Virtual Door   Camera

**Unity**

# Prototype

**Prototype 01**
Three door open directions increase the way of interaction.
Each door controls one effect.

**Prototype 02**
Reduce the volume of box allow user to easily hold and rotate it.
Add a rectangle shape of window on the door.

**Prototype 03**
Replace wooden box with matte acrylic to strengthen
the material and enlarge the window to hide the sensors.

**Prototype 04**
Use an electrical slip ring bearing in the back of the
box to avoid the kink of wires while rotating and also
for power supply and data transmission.