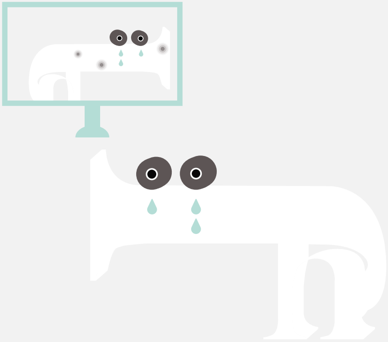
# *How can I deeply empathize with the Public Service Advertisement?*

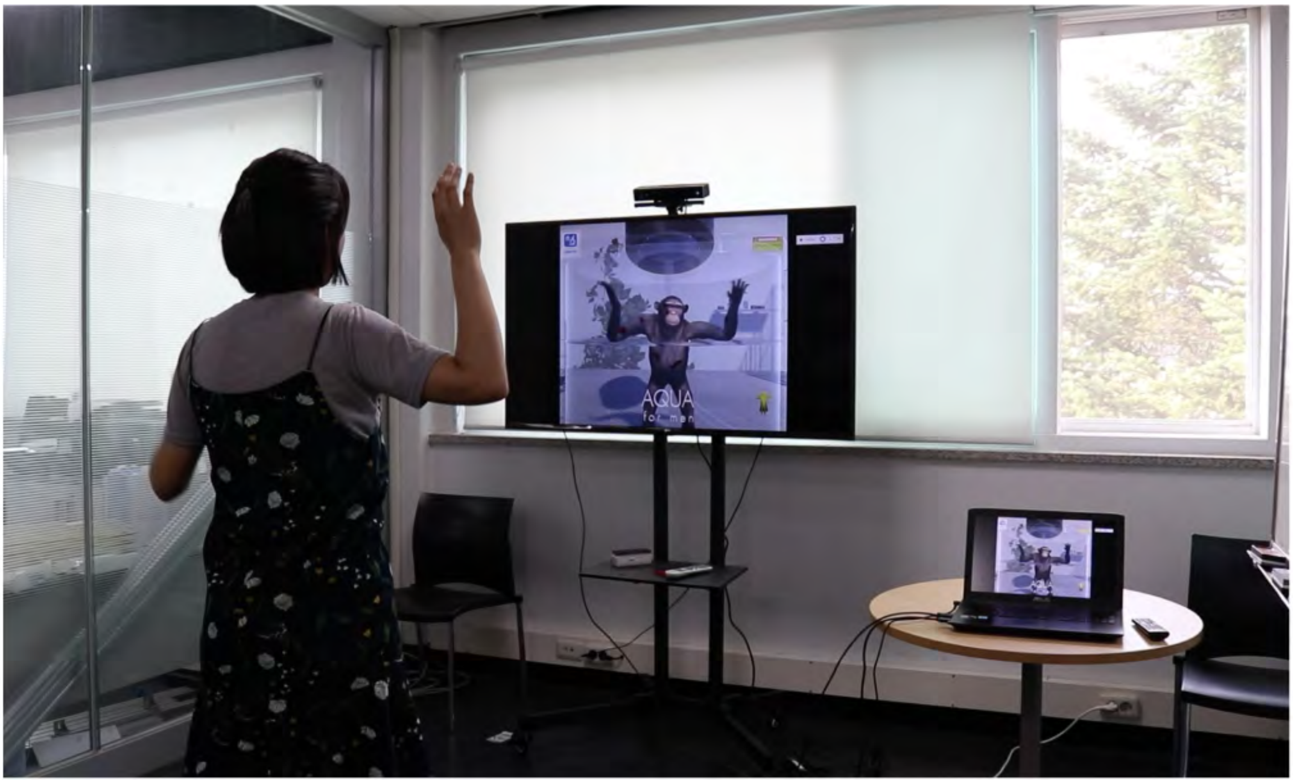


# INTERACTIVE PUBLIC SERVICE ADVERTISEMENT(PSA)

Interactive PSA explores the impact of empathy on mapping audience's body posture on the virtual character and design considerations on interactive PSA

2019
Master's Thesis Project,
KAIST
(Individual)

- Programming(C#, Unity)
- PSA Scenario Design
- User Research · Analysis



## Research Questions

Q1. Will mapping the body movement of the participant on the character of the PSA show the impact on cognition, empathy, sympathy, and perceived seriousness, and behavior of the participant?

Q2. Will the different levels of embodiment from subtle, medium to strong levels bring change in cognitive and behavior?

Q3. Will characteristics of the PSA topic and character appearing in it influence the participant's experience on the embodied interactive PSA?

Q4. What will be the design considerations for creating embodied interactive PSA?

## Approach

### Solve Shortcomings of Current PSA + Serious Game

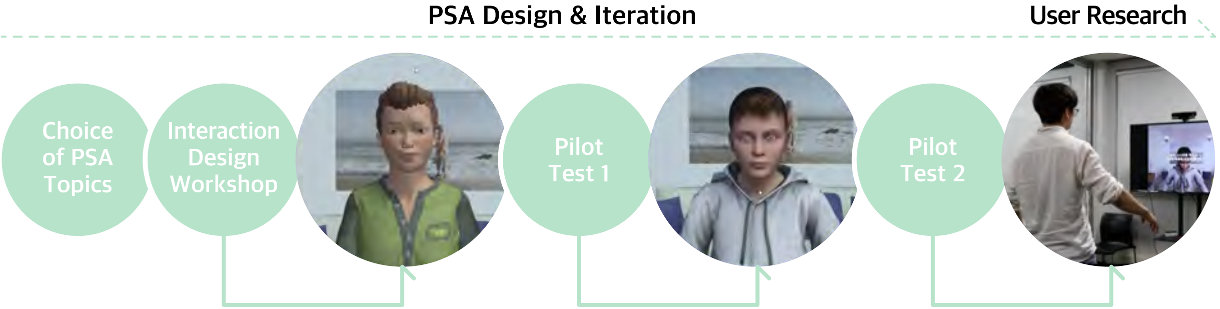
**Current Interactive PSA:**
Participant as a third party, making them difficult to get empathized on the issue

**Serious Game:**
Players become the  game, proved to be effective in understanding the situation of the sufferer

→

**Suggested Interactive PSA:**
Put participants in sufferer's shoes through mapping participant's body movement on to virtual character's movement

## Overall Process


PSA Design & Iteration
User Research
Choice of PSA Topics
Interaction Design Workshop
Pilot Test 1
Pilot Test 2

## Interaction Design Workshop

**Goal**:
Explore interaction flow, design rationale for characters and their postures, and details of the scenario

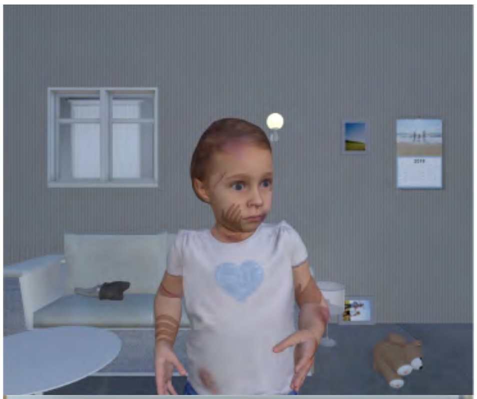
**Result1**:
The character's posture should be upright, resembling the posture of the passersby

**Result2**:
Intended restriction of the characters' movements may symbolize enervation giving dumpishness to the audience

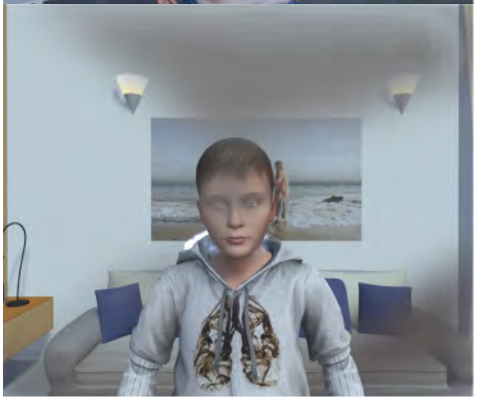
## PSA Design Process: Character Design & Scenario Design

**Design of the character and its render style** was modified, applying the feedbacks of the pilot test one

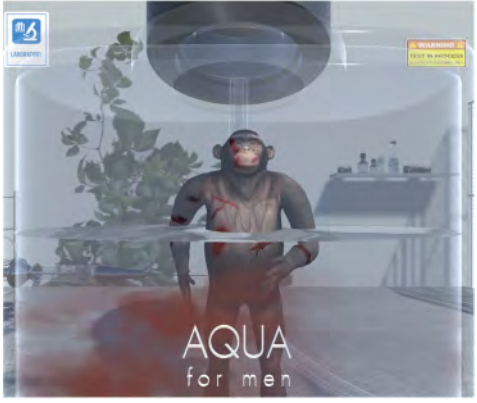
**PSA scenarios** are designed throughout (1) referring design guidelines in PSA theories, (2) analyzing the result of the interaction designer workshop, (3) investigating flow patterns, elements, and the stimulus of the previous PSA films. The topics were chosen with special caution on the ethical issues



**Child abuse:**
"The pain lasts a lifetime. Help stop domestic child abuse"



**Secondhand smoking:**
"You smoke, they also smoke. Secondhand smokers are on the worst side of the cigarette"



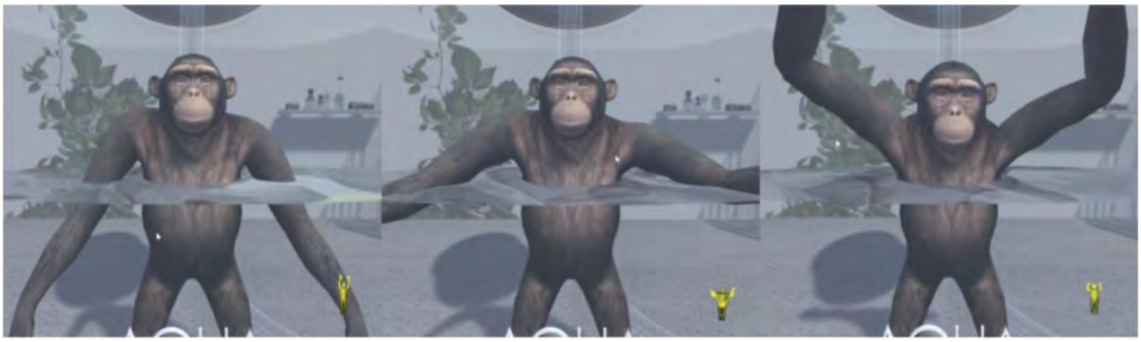
**Animal cosmetic experiment:**
"All life matters. Fight against cosmetic testing"

## PSA Design Process: Embodiment Level Manipulation

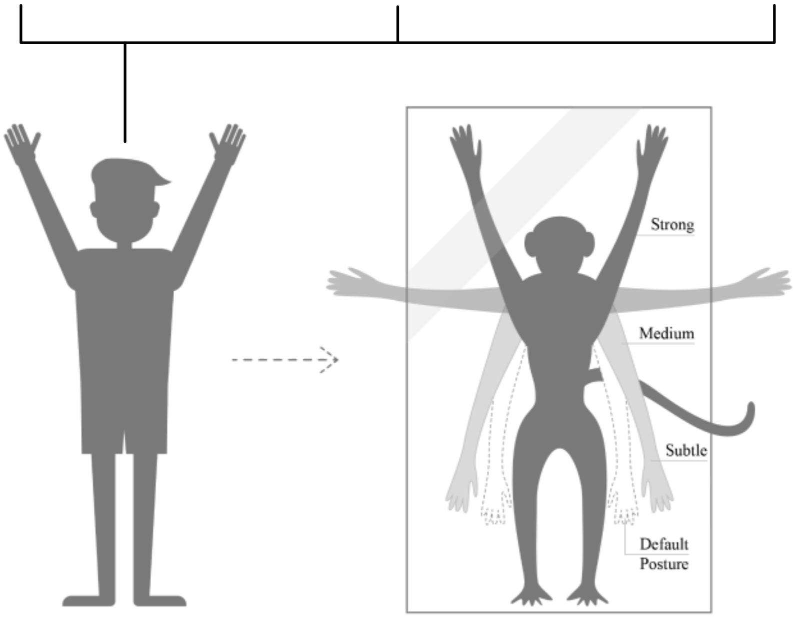
Embodiment level is manipulated to investigate the hypothesis – different levels of embodiment, from subtle to strong mirroring, may induce distinctive effects (ex. limited movement of the character will give an oppressive feeling to the participant).

The three different levels of embodiment – 10, 60, and, 100 percent – were applied by altering the interpolation value in the script of Kinect Avatar Detection. The code Quaternion. Lerp() calculates spherical interpolation value between the start and target rotation.

Description on a character's maximum movement for three different embodiment level applied



Subtle embodiment Medium embodiment Strong embodiment



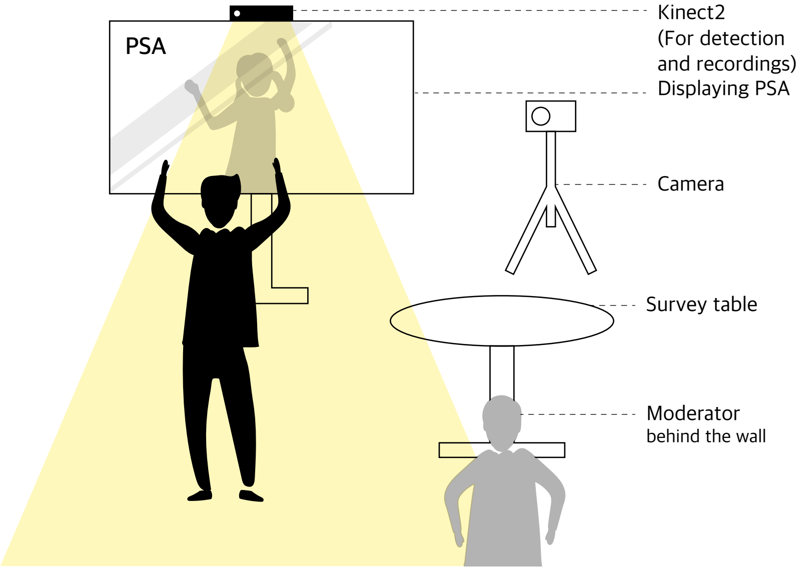
# User Research (36P)

Warnings on the sensitive and pungent contents were notified in the process of recruitment

1 Introduction on the test

2 Experiencing the three PSA topics (1m per each), followed up with survey

3 Interview (10 minutes)


PSA
Kinect2
(For detection
and recordings)
Displaying PSA
Camera
Survey table
Moderator
behind the wall

# Discussion & Implication

## 1 Different design approaches are required in designing PSAs with differing characteristics

**Animal cosmetic experiment**

*Low-interest level and few previous experience*

Showed effectiveness of embodiment due to unfamiliarity of the issue and participants' low expectation on the movement of the non-human character

**Secondhand smoking**

*Previous real-life experience & high familiarities*

Requires an impressive and fresh approach for the topic with high familiarity. Strong real-life past experiences hinder compassion toward the subject

**Domestic child abuse**

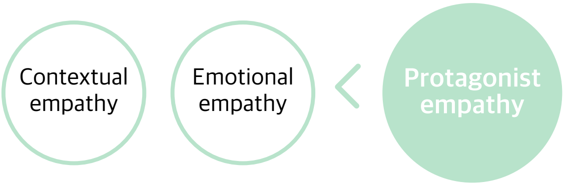
*High interest on the issue with less experience*

Requires sufficient visual stimuli to bring movements' of the participants, which will increase the chances for participants to get empathized with the character

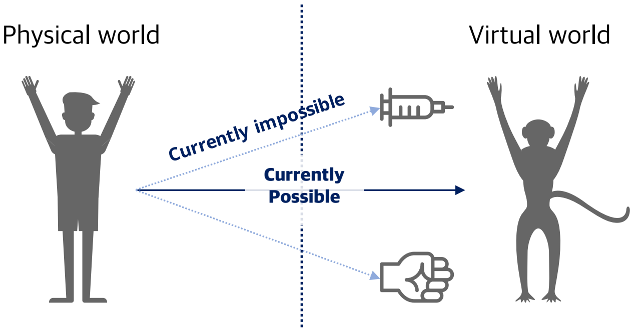
## 2

## Increasing empathy on the context of PSA and emotion of the character may affect the expansion empathy

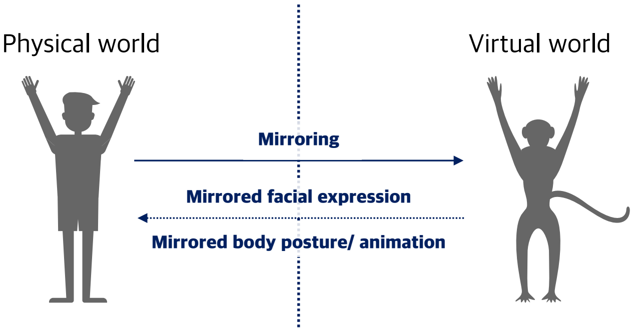
Results on empathy mainly stemmed from participants' feeling of being the protagonist of the PSA


Contextual empathy
Emotional empathy
<
Protagonist empathy

**Increasing empathy toward the context of the PSA:**
Currently, the audience can only affect the movement of the character.
Expanding interactivity - enabling audience's influence on elements in the virtual world - may increase empathy toward the context.
For instance, the participant can block the injection that is about to stab the character.


Physical world
Virtual world
Currently impossible
Currently Possible

**Increasing empathy on the emotion of the character:**
There is mirrored effect, The mirrored effect occurred - the virtual character's facial expressions get mirrored to the audience and elicit the same emotion.
Like so, body posture and movements of the virtual character may show the same mirrored effect.


Physical world
Virtual world
Mirroring
Mirrored facial expression
Mirrored body posture/ animation

## 3

## Design consideration on using subtle level of embodiment and its impact

Subtle level of embodiment

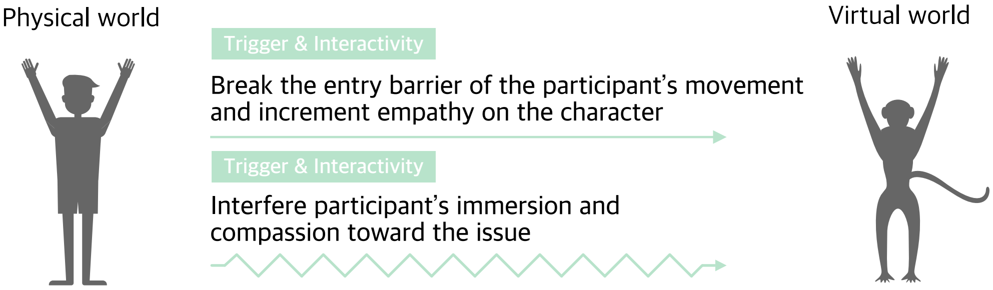
Arouses interpretation and understandings on the character’s situation

Arouses negative emotions such as oppression, depression, and frustration

**Participant indirectly goes through the experience and feels the character’s emotion through the limitation of the movement**

## 4

## Interactivity, a double-edged sword



Physical world

Virtual world

Trigger & Interactivity

Break the entry barrier of the participant’s movement and increment empathy on the character

Trigger & Interactivity

Interfere participant’s immersion and compassion toward the issue

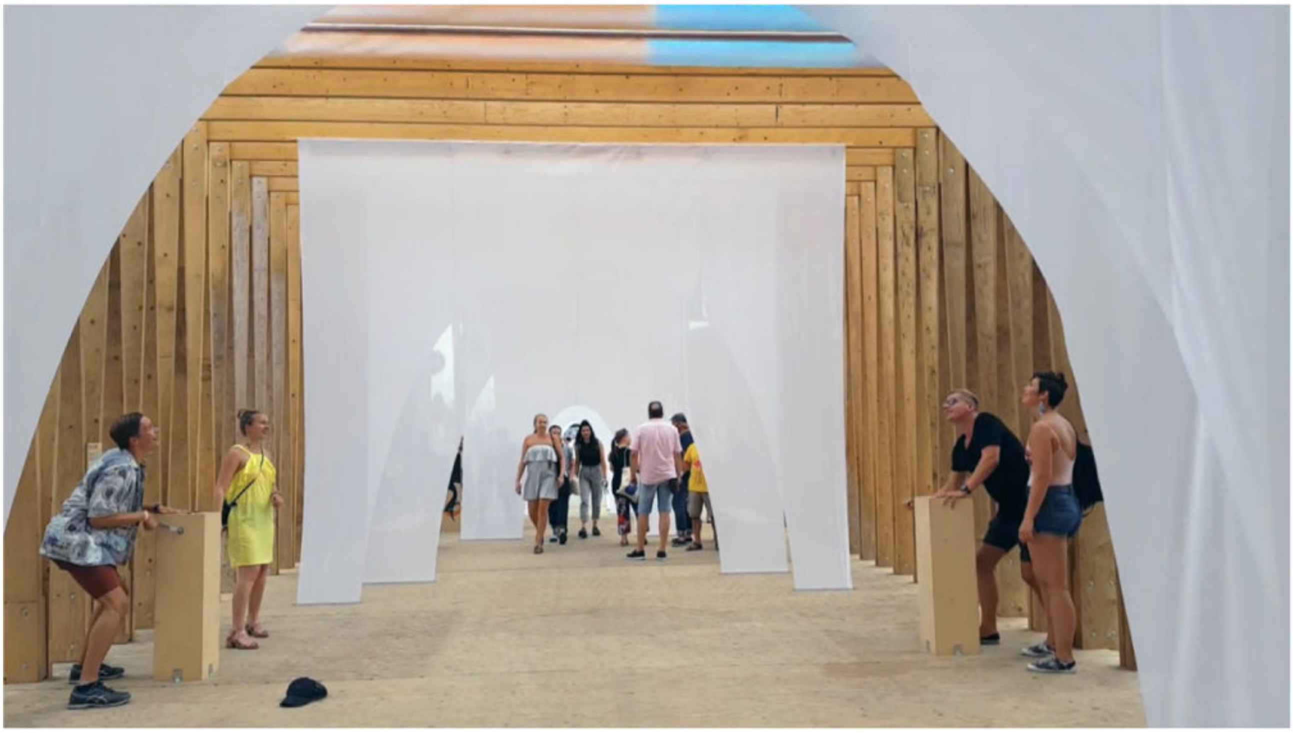
# Line of Light

Line of Light is a two-player interactive game using LED Strips and cranks with two different modes of game

2018
Collaborative Project at Aalto, New Media Design and Production

Exhibited at
FLOW Festival (Aug 2018)
Aalto Väre (Sep 2018)
Games Factory (Oct – Dec 2018)

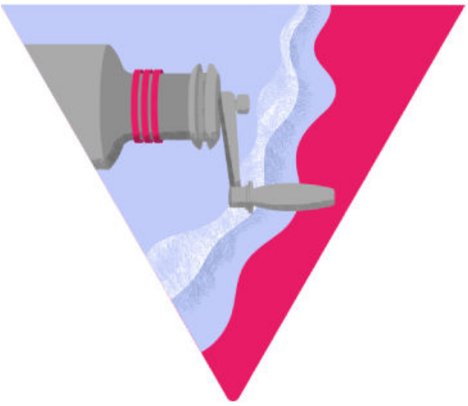
- Game Level Design
- Hardware fabrication
- Software Design (Arduino Teensy Board)
- Installation



# Ideation

The core aim of the project is to raise awareness of the polluted Baltic Sea.
Line of Light indirectly speaks out the issue using LED Strips to express the streams of the sea tide, along with the cranks. Considering the mood of the festival, the game has two different modes of the game: a competitive mode and a collaborative mode.

**TOPIC (BALTIC SEA)**
LED Sea Tide + Crank



**GAME ENVIRONMENT (FESTIVAL)**
Easy + Approachable + Safe + Fun

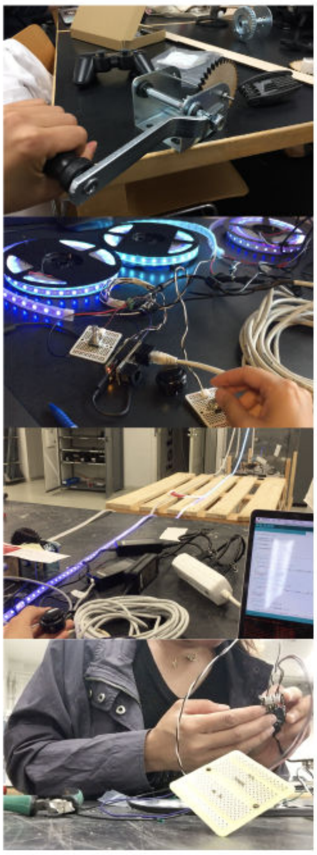
**GAME VARIATION**
Competition Mode + Collaboration Mode

DESIGN PROCESS

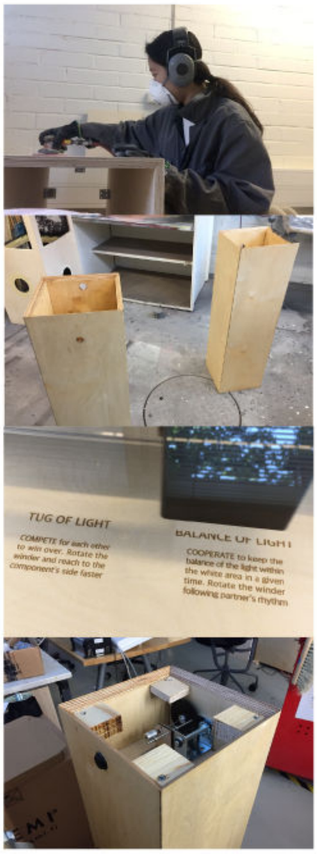
# Design Process

1 Design concept proposal & iternations

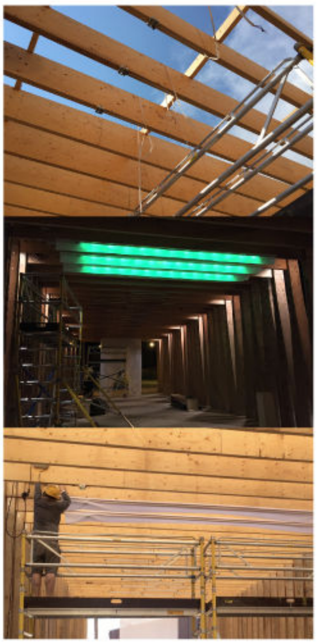
2 Controller structure design & game programming



3 Manufactoring of controller boxes


TUG OF LIGHT
COMPETE for each other to win over. Rotate the winder and reach to the component's side faster
BALANCE OF LIGHT
COOPERATE to keep the balance of the light within the white area in a given time. Rotate the winder following partner's rhythm

4 Installation over three days

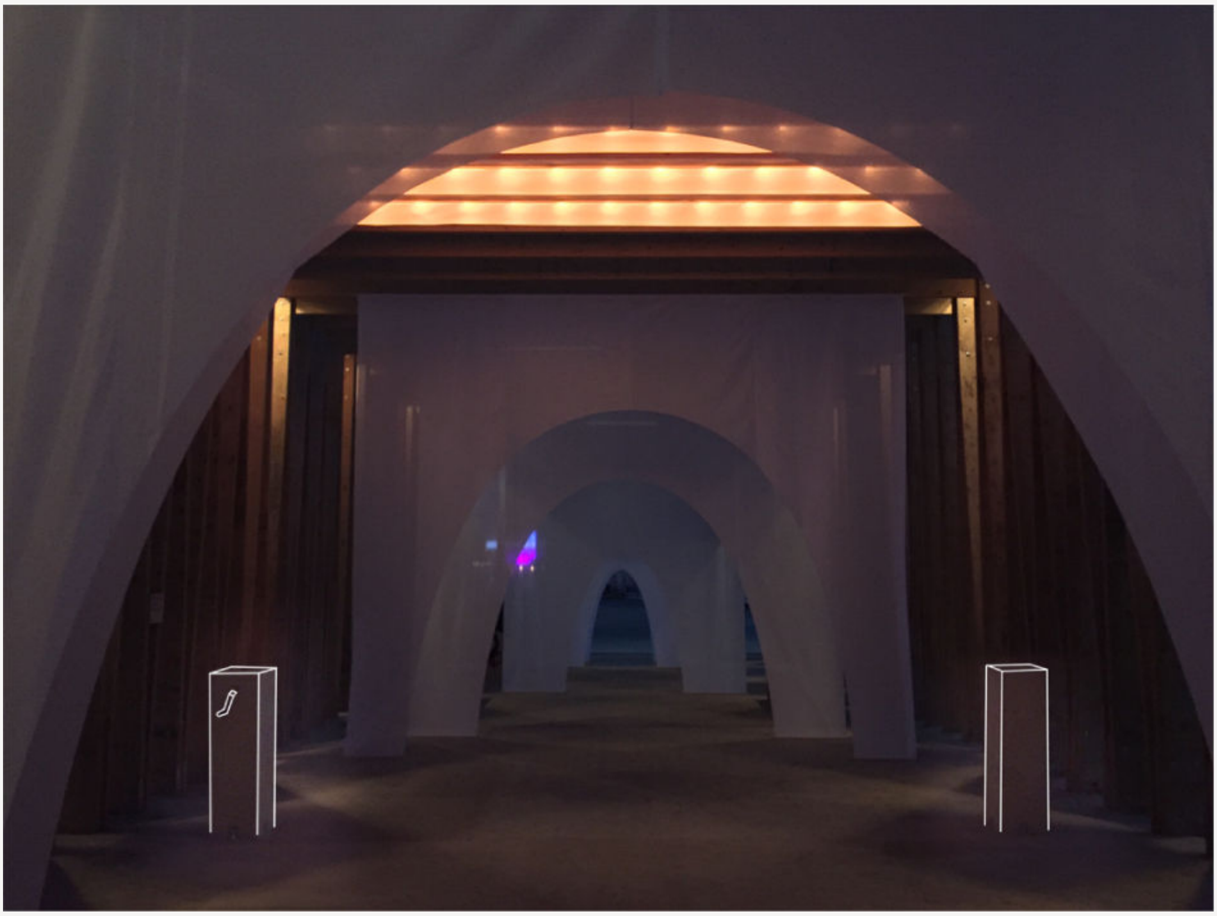


# Installation Overview

Three LED Strips are installed on the ceiling of Aika-Lava, a wooden architecture built for the festival.
Game boxes are positioned on the floor, facing each other.

**Size of the Game**

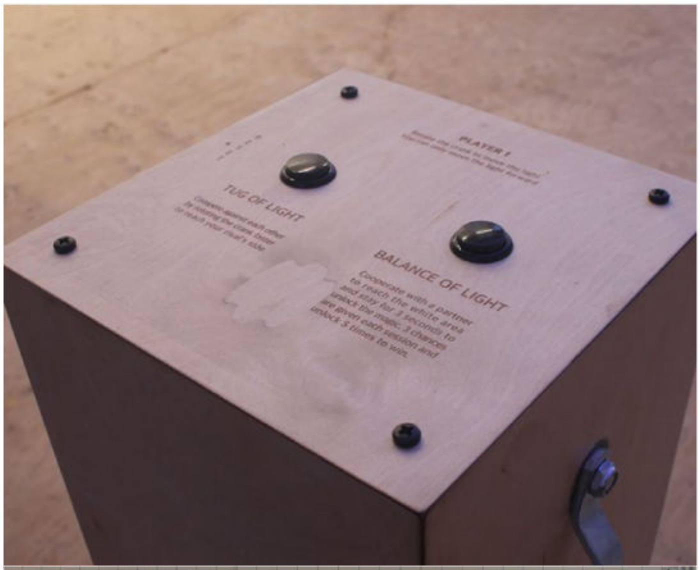
3 LED Strips installed on the ceiling (157.5x39.4 inch)
Two box controllers (9.5x9.5x39 inch)



# Game Mode

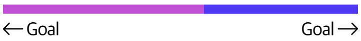
## Default Mode

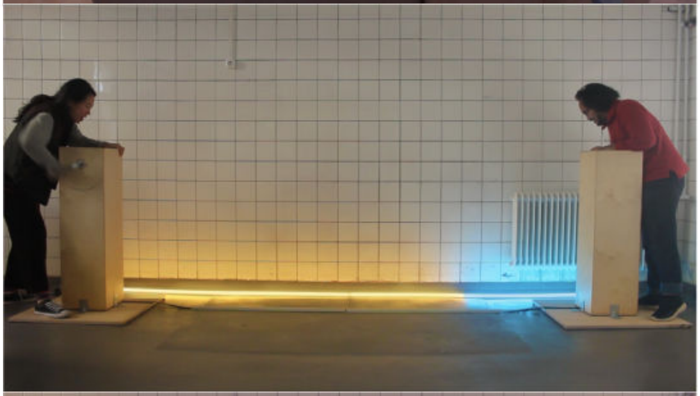
The LED lights move from one edge to the other edge, streaming like the sea tide


PLAYER 1
TUG OF LIGHT
Compete against each other
by rotating the crank faster
to reach your rival's side
BALANCE OF LIGHT
Cooperate with a partner
to reach the white area
and stay for 3 seconds to
unlock the magic. 3 chances
are given each session and
unlock 5 times to win.

## Tug of War

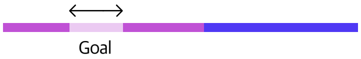
Compete against each other by rotating the crank faster to reach out to your rival's side.

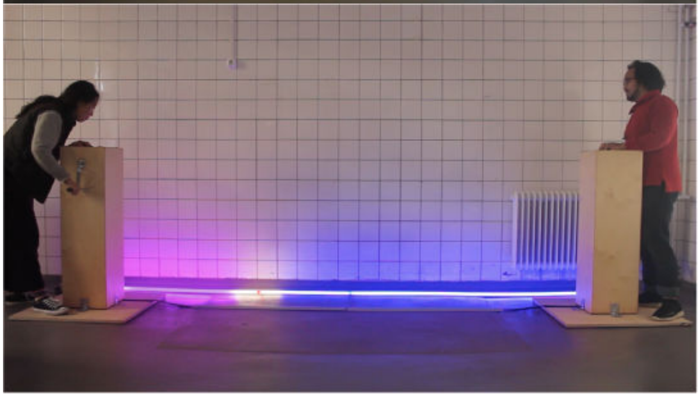


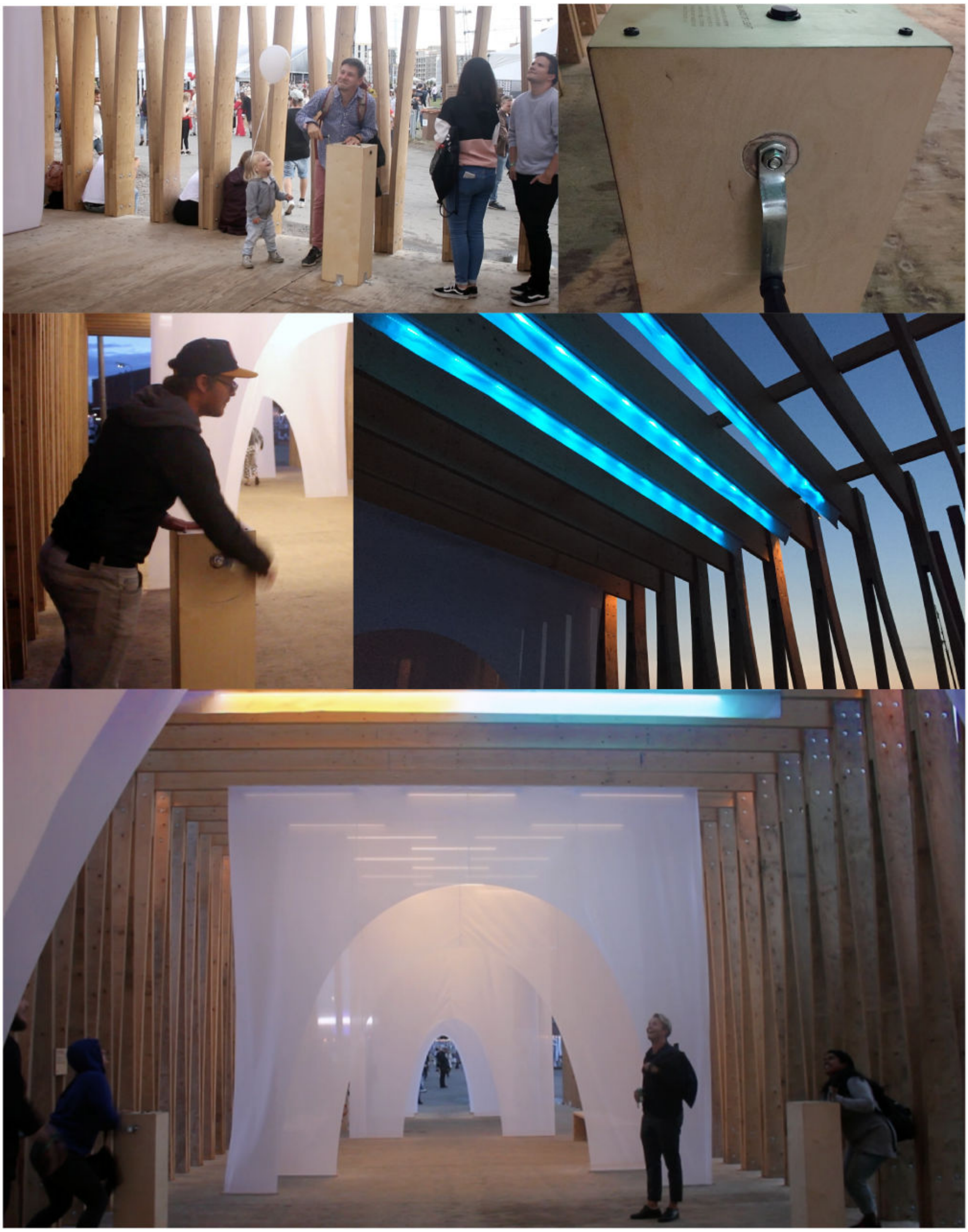


## Balance of Light

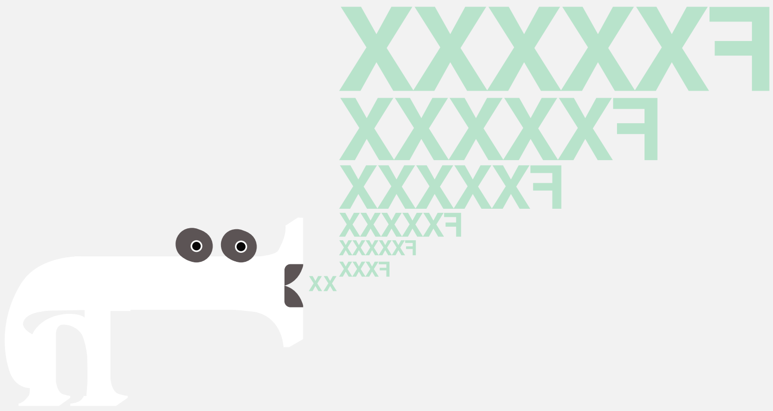
Cooperate with your partner to reach and remain in the white area for 3s to unlock the magic. Unlock 5 times to win, within three chances given.







# *Swearing all the times? Better watch out what you say to others. What comes around goes around!*

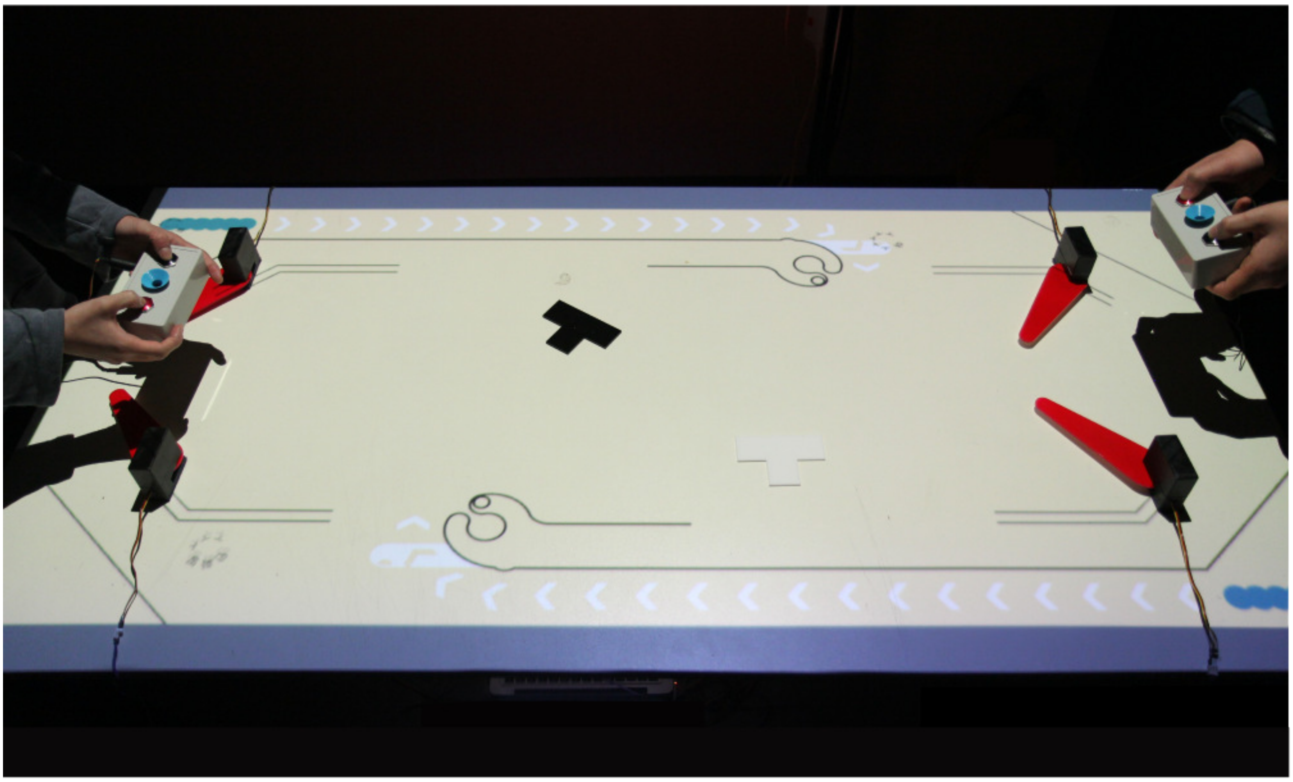

XXXXXF
XXXXXF
XXXXXF
XXXXXF
XXXXXF
XXXF
XX

# PUCK YOU

Puck You is game using speech recognition to alert the message of "What comes around goes around".

2016
Collaborative Project

- ≡ Hardware Modeling and Production
- ≡ Graphic Design
- — Programming

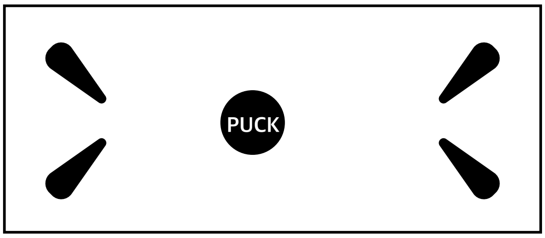


## Design Goal

Puck You tries to deliver the message of “What comes around goes around”. The game uses speech recognition technology of Google to transform the spoken swear words into the figure of a virtual puck. Two players have to bounce off the pucks with flippers, controlled by the joystick to prevent one’s own inappropriate words bouncing back to oneself.

## Design Concept

The game uses pinball as a metaphor and the ball takes the form of **a hockey puck - a kind of word play**

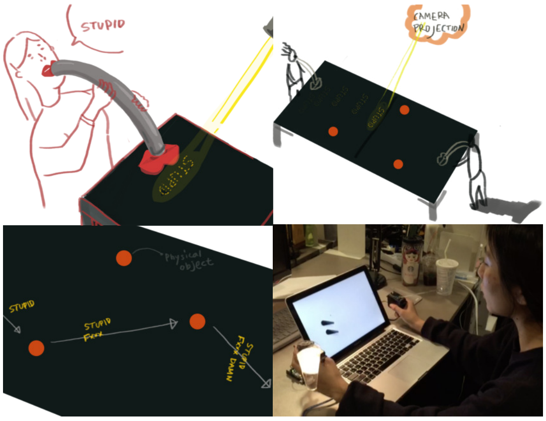


## Idea Development

**Initial Idea:**
Focused on controlling the flipper itself through voice control

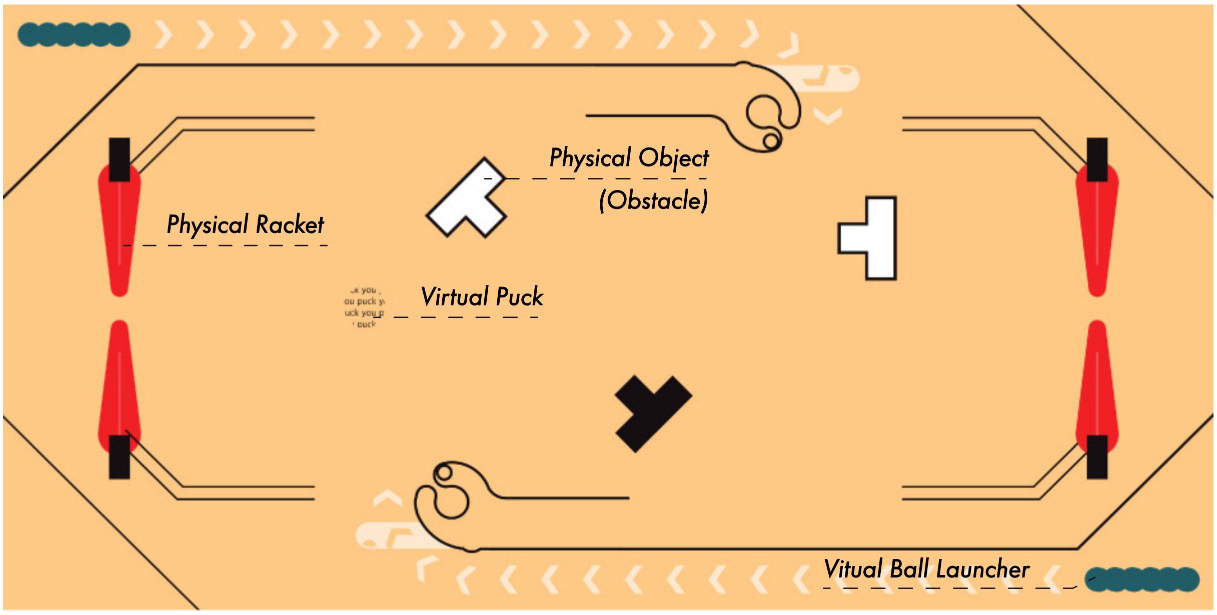
**Faced Problem:**
The plan was altered due to:
1) Inability to deliver the message of the game in a proper way
2) Countless noise in programming and making it impossible to precisely control the flippers

**Modified Idea:**
The players create the puck by swearing words through voice recognition and bounce it off with the controller



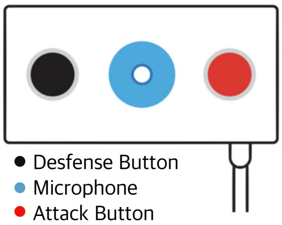
## Game Elements

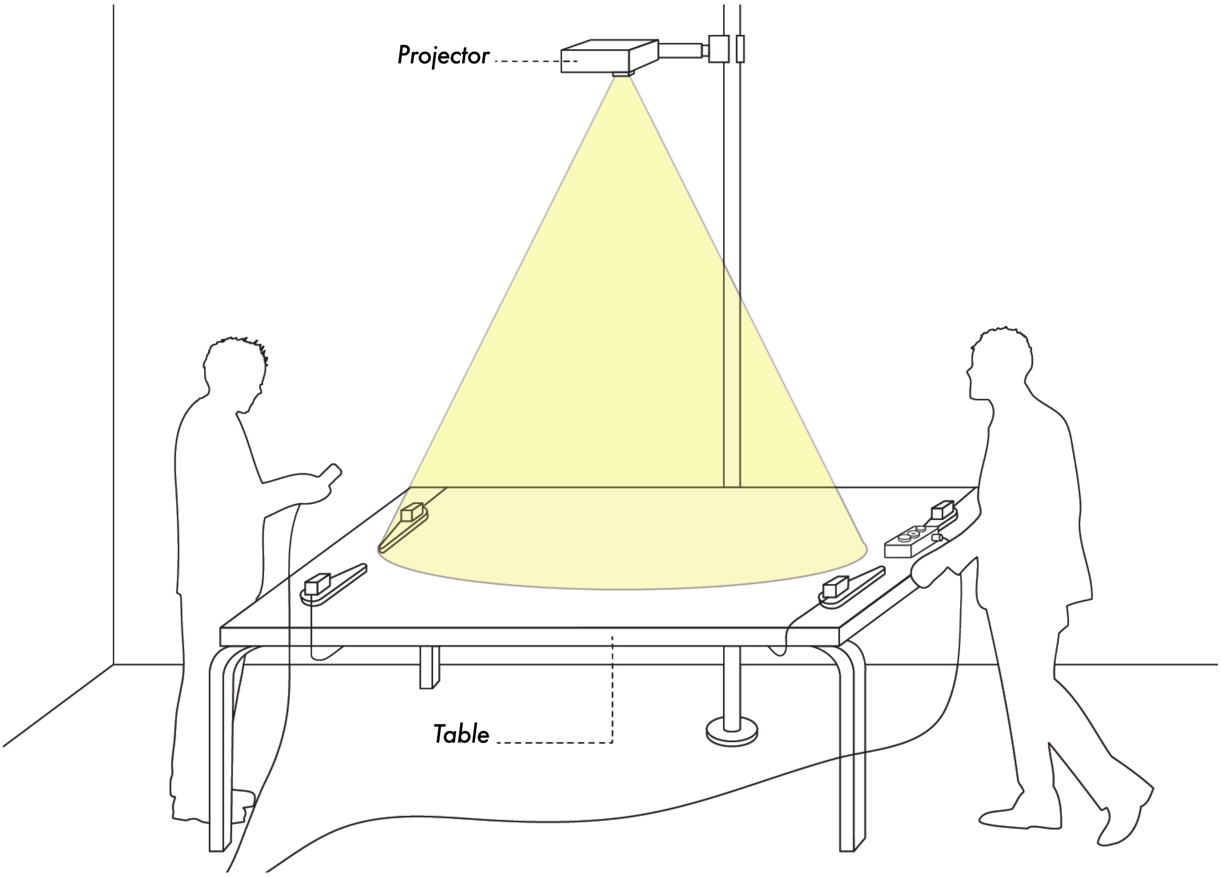
Game elements consist of both virtual and physical components. The overall board of the game is projected virtually onto the table. The flippers and two obstacles are physical objects to enhance the enjoyment and immersion of the game. Each player is given a game controller equipped with a microphone in the center for voice input and two pushbuttons are positioned on both sides of the controller: one used for attack and the other for defense.

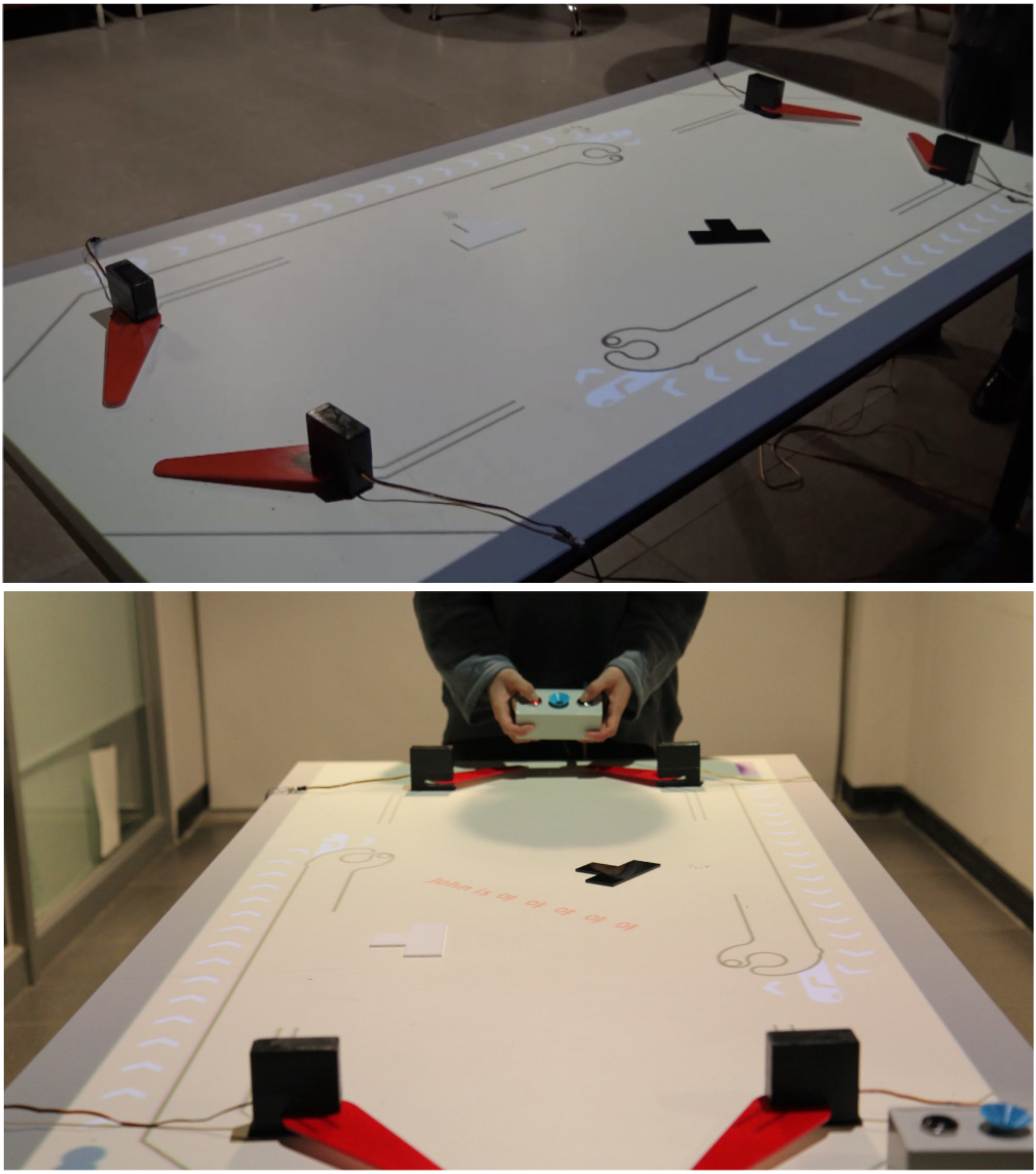

Physical Object
(Obstacle)
Physical Racket
Virtual Puck
Vitual Ball Launcher

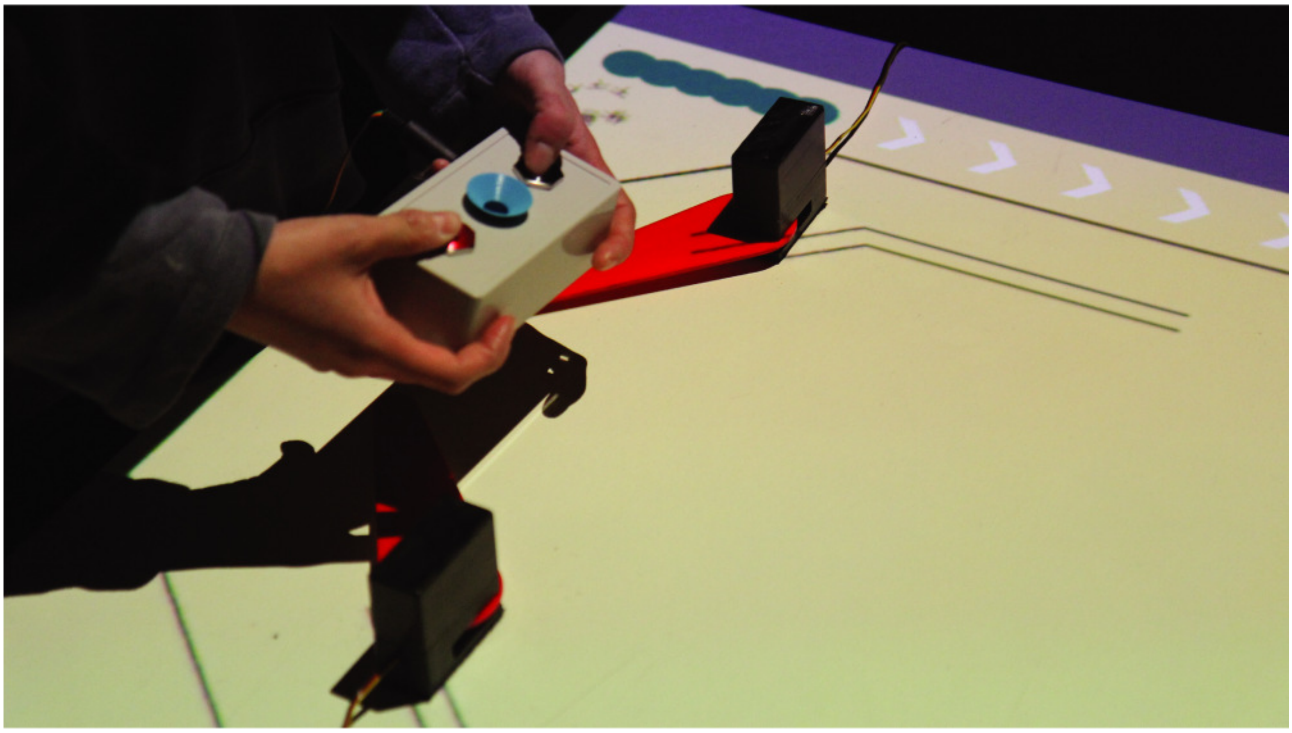
# How to Play

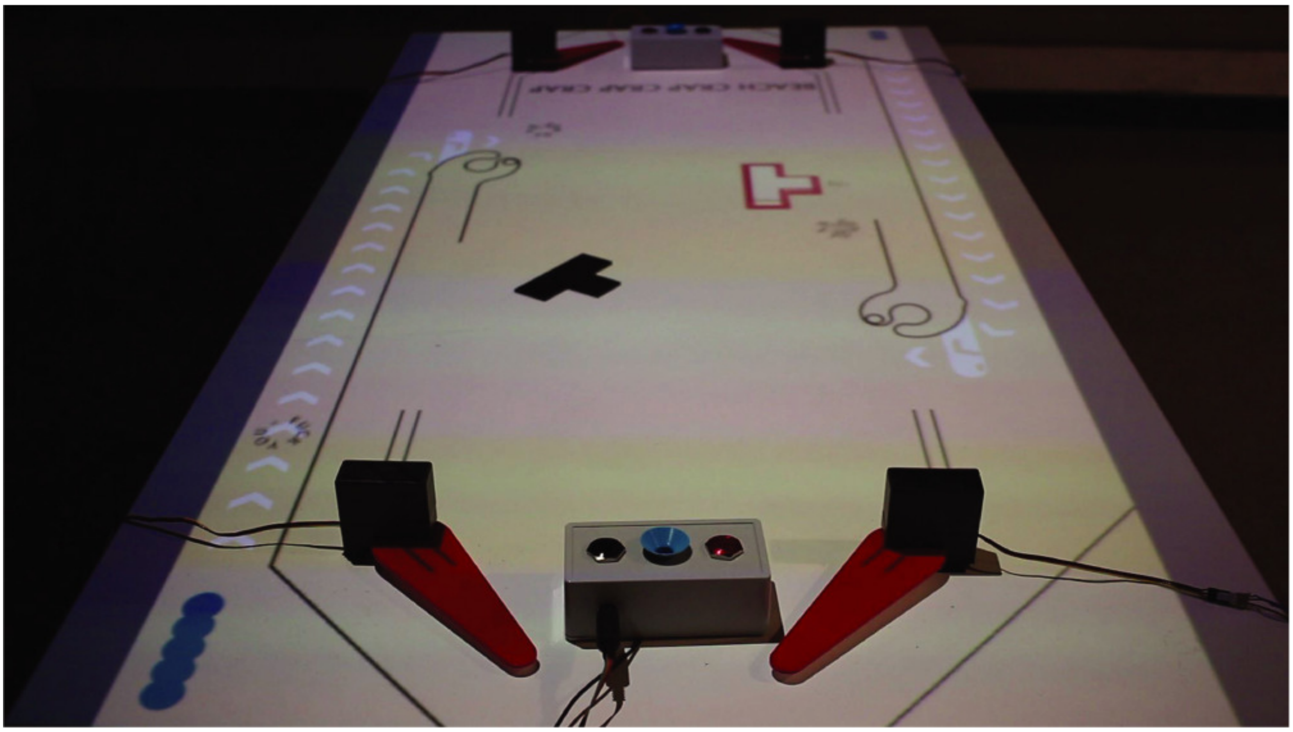
Two players stand at two sides of a table, facing each other. Players shout out offensive words to generate virtual puck. The puck, the result of the transformation of spoken swear words, bounces off the borders and obstacles in the game. Players attack or defense, by pushing buttons on the joystick. The game ends when a player loses six points, projecting all the swearing words spoken during the game on the side of the person who got lost.


● Desfense Button
● Microphone
● Attack Button

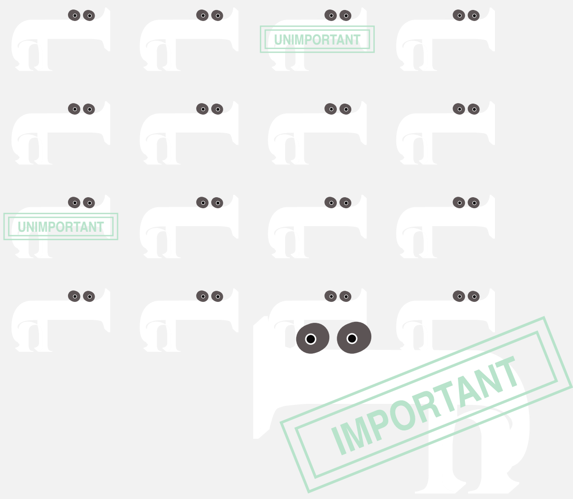

Projector
Table






BEACH CRAP CRAP CRAP

# What could be the way of living in this vulnerable society surround by numerous people?


UNIMPORTANT
UNIMPORTANT
IMPORTANT

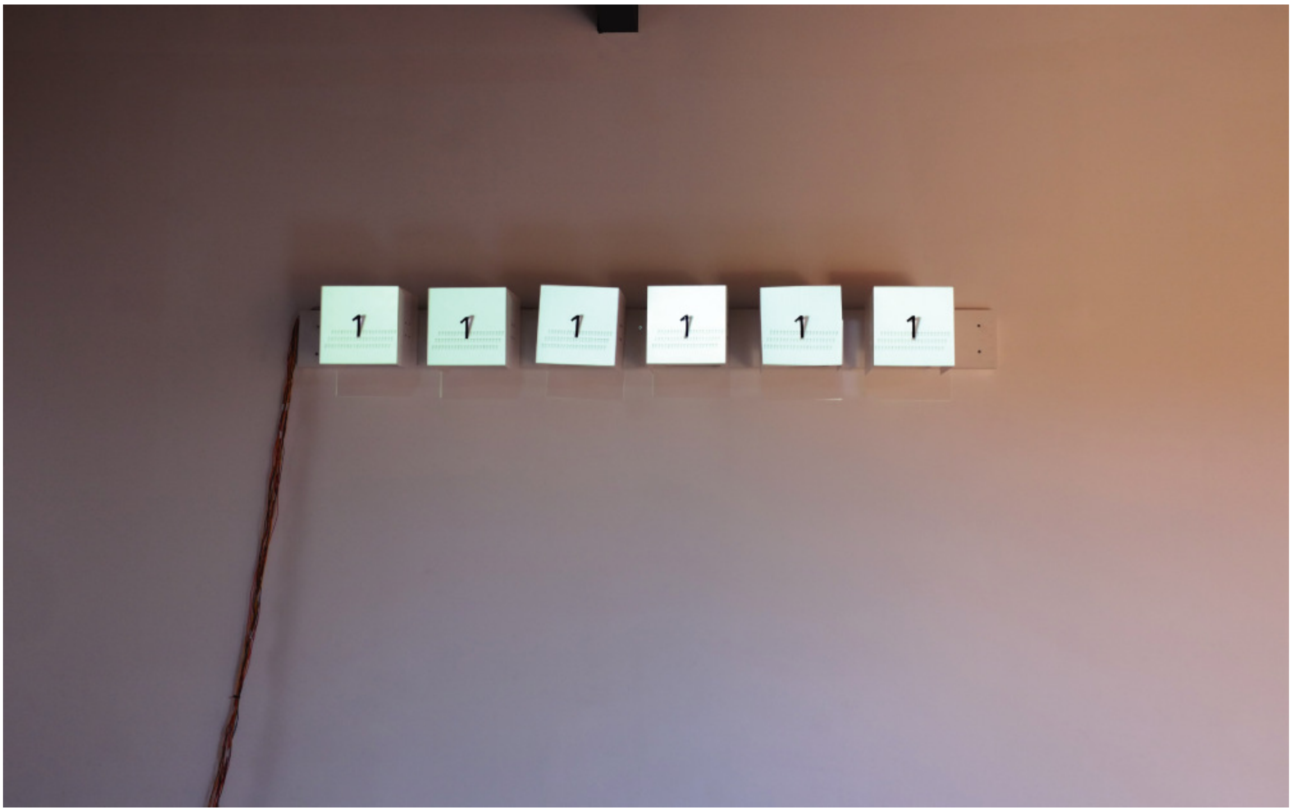
# Individualism

Individualism, a kinetic installation, aims to raise awareness on the importance of individualism, to achieve the greatest value.

2017
Individual Project

Exhibited at PLACE MAK,
YeonHui, Korea

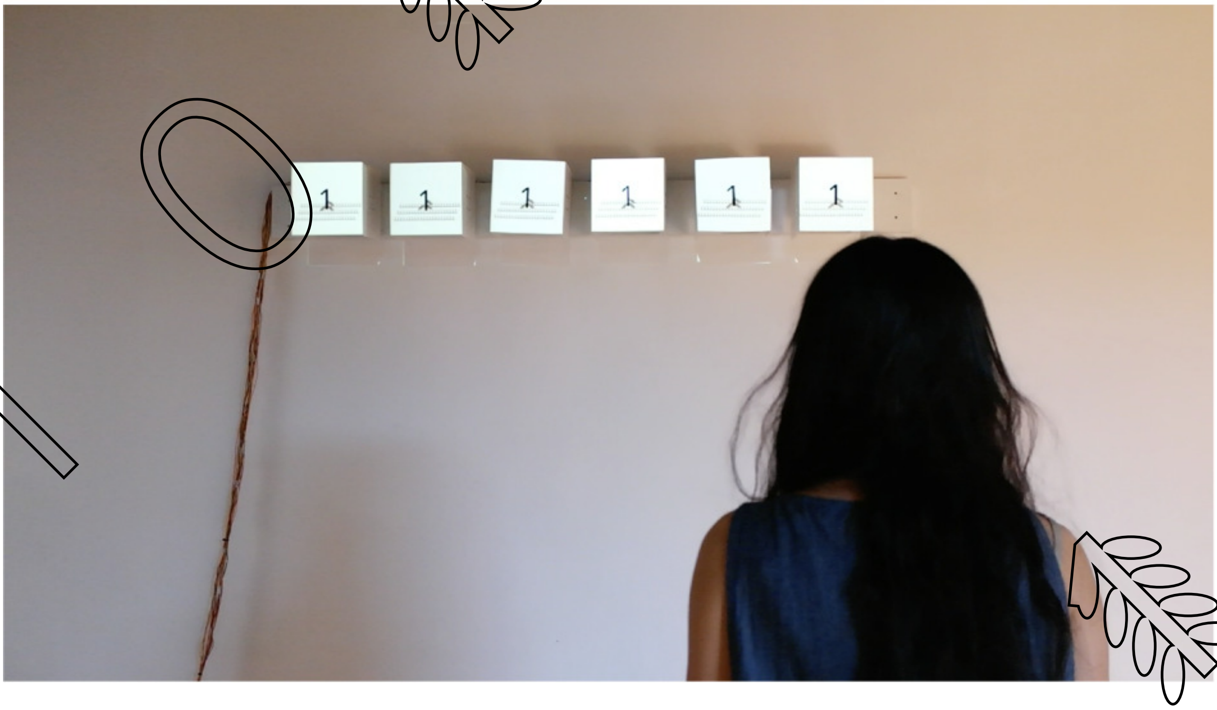
- Programming (C, Arduino · Java, Processing)
- Hardware Design
- Typography Video Design



## Installation Background

We are masters of our lives, which however often excessively involve others in our lives, ending up prioritizing others than ourselves, It is time for us to rethink the way of life in this society.
The work suggests that individualism will give the greatest value.

The installation uses elements of two binary numbers 0 and 1, each presenting others and myself.
The more concentration it goes to yourself, the total value will reach its maximum value, while the value decreases as others get prioritized.



# Design Process

Message
Individualism, a virtue

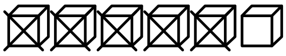
**WHY?**

Why is this message important?

Which concept & Why?

How it will get delivered to the audiences?

Iterations to make the perfect cube



Iterations to detect the number of people through webcam

Kinect

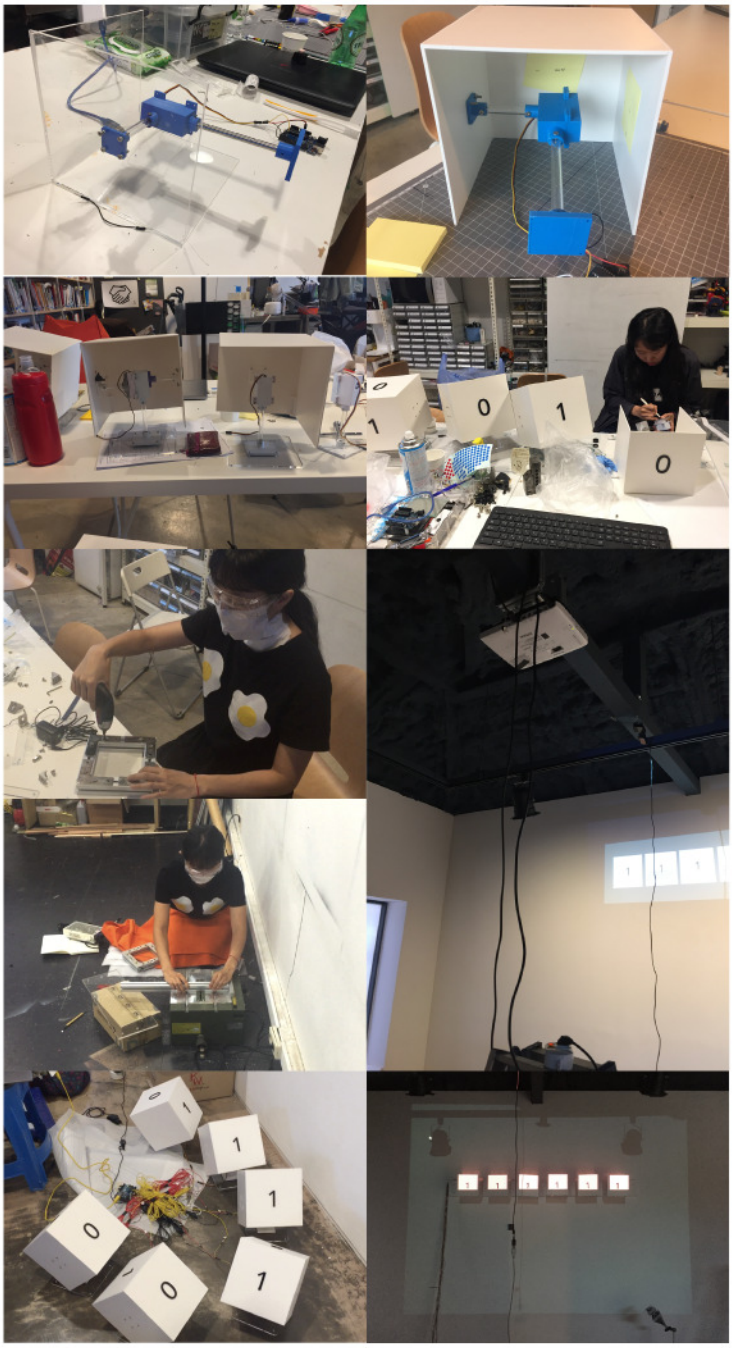
~~Blob detection~~

~~OpenCV face detection~~

Background subtraction

Installation

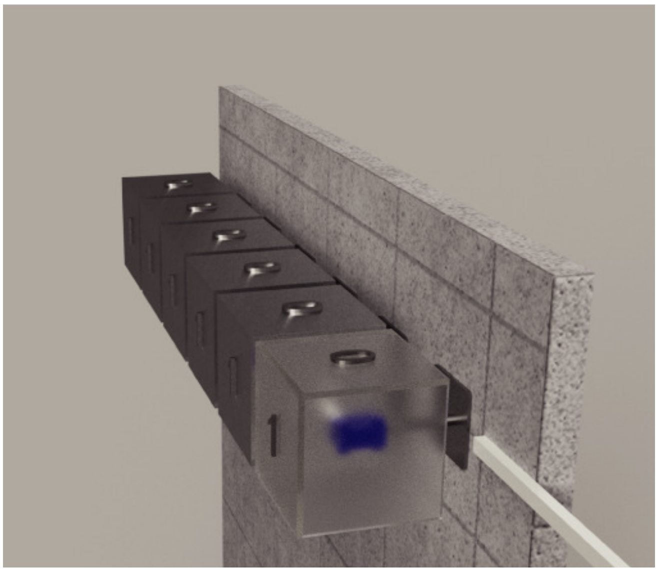
Projection-Mapping

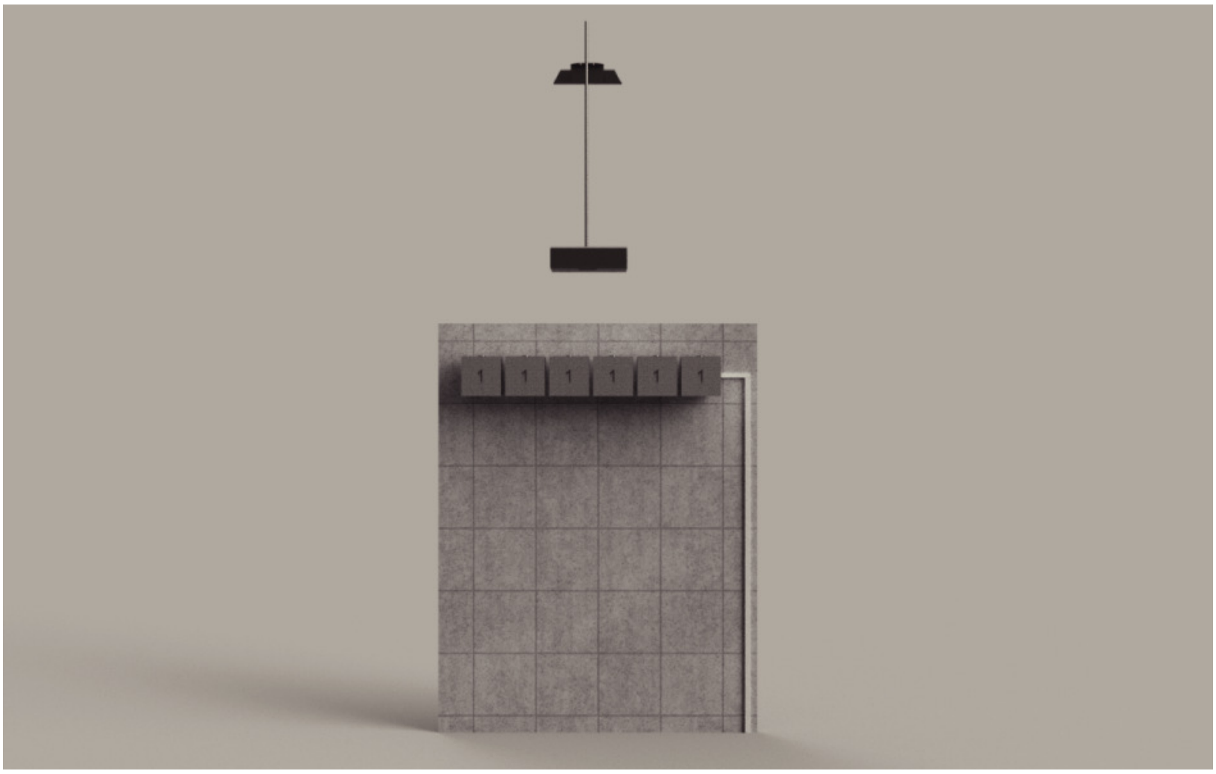


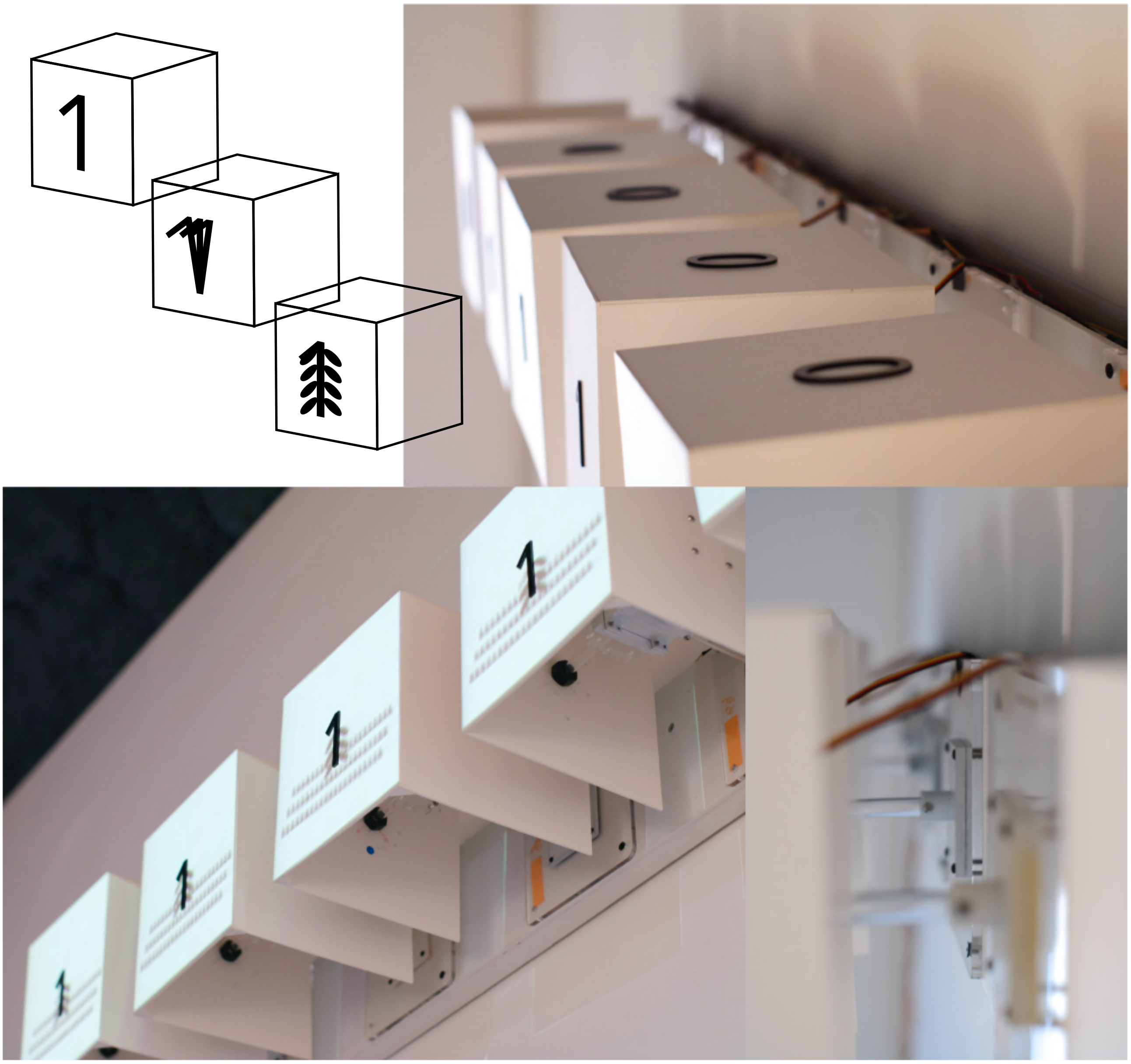
## How it Works

Six cubes have two sides with numbers of 1 and 0 attached to each of them. The cubes react to the number of people, sensed through the web camera installed on the ceiling. According to the number of people, the servo motors rotate responsively.

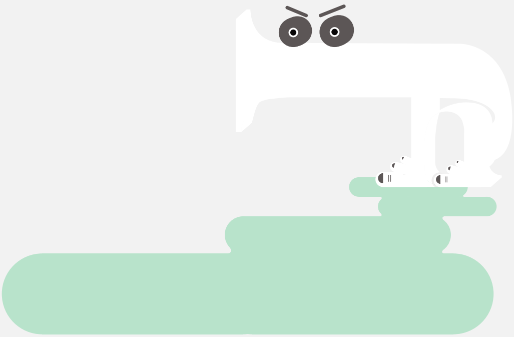
When there are more than six people, the cubes display 0,0,0,0,0,0 – the calculated number of zero. As the number of people decreases, the cubes rotate showing changes from 0 to 1, starting from the right side of the cube.
The maximum value the cubes can show – 1,1,1,1,1,1 is only displayed under one circumstance: when there is a single audience. The video is projected on the surface of the cube in return as a reward.






1

# Is it too hard to speak out sorry? Apologize in words!

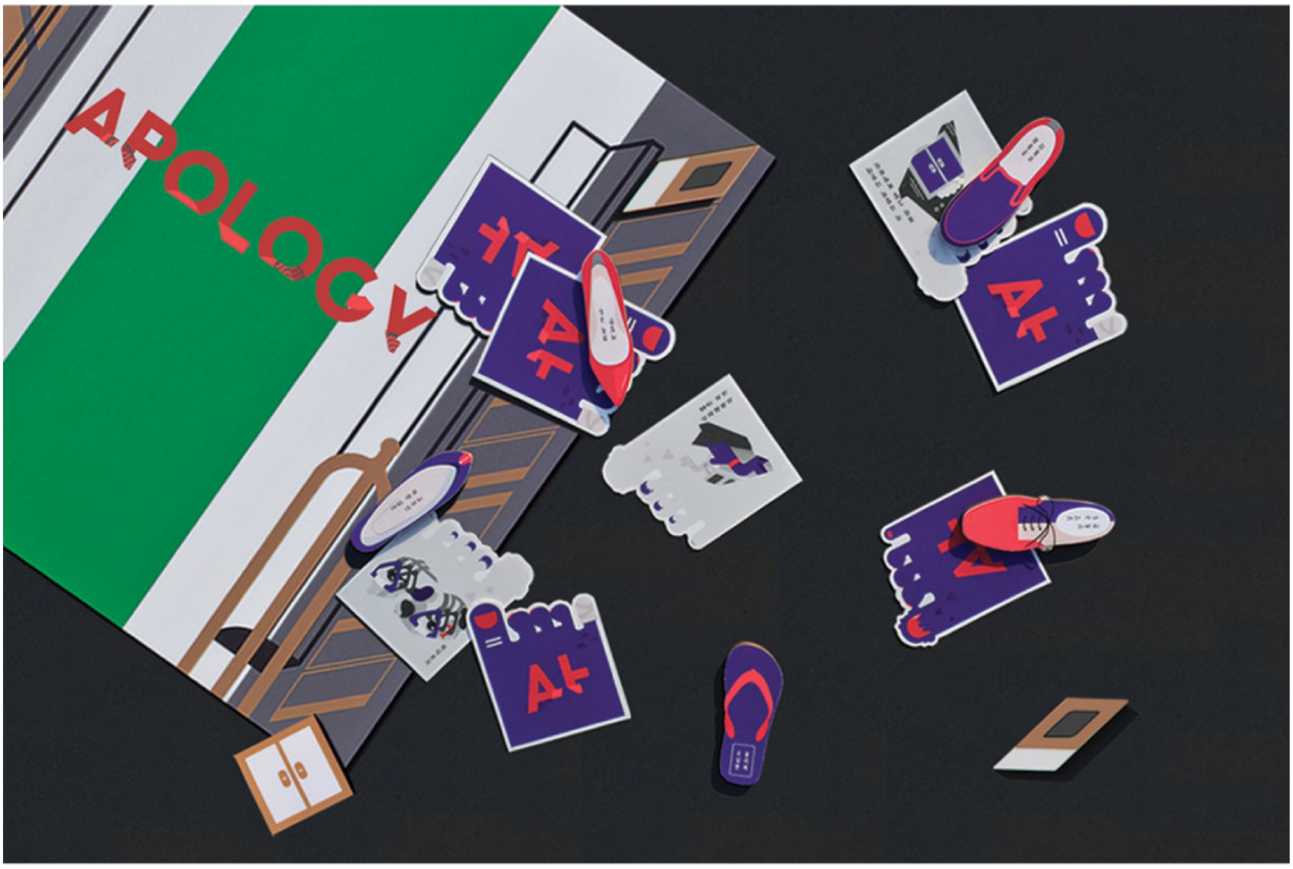


# Apology

The Apology board game aims to give the experience to look back on the player's way of apology.
It tries to deliver a message that nonverbal apology cannot be understood. Apologize with words.

2015
Individual Graduation Project

Exhibited at
Fifty Fifty, Korea ·
Incheon International Design
Fair

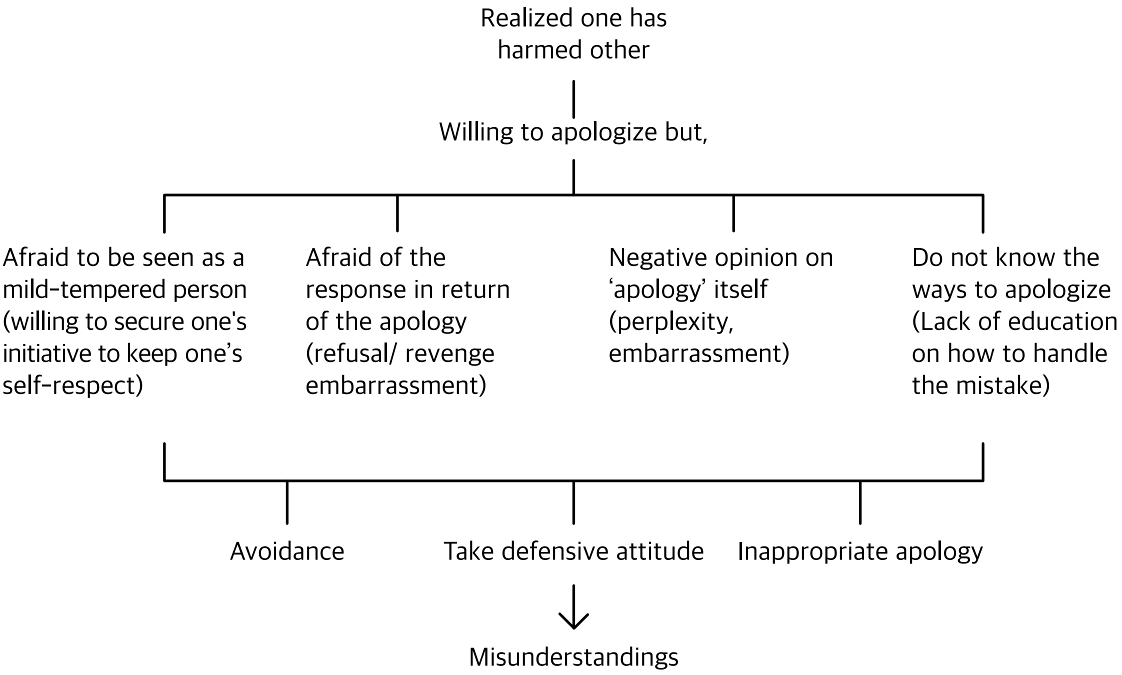


## Design Background

I had personally undergone several experiences of getting stepped on by others at the bus stop, subway, crowded space, and every other place. There was frequently no apology in words in return, but only ignorance and short glance followed up. The reluctance to apologize out loud is a deep-seated problem of Korean culture.

## Why people hesitate to say sorry?

Various reasons suppress one from showing apology out loud, which often leads to misunderstandings between the two - one who steps on the foot and the other who gets stepped.


Realized one has harmed other
Willing to apologize but,
Afraid to be seen as a mild-tempered person (willing to secure one's initiative to keep one's self-respect)
Afraid of the response in return of the apology (refusal/ revenge embarrassment)
Negative opinion on 'apology' itself (perplexity, embarrassment)
Do not know the ways to apologize (Lack of education on how to handle the mistake)
Avoidance
Take defensive attitude
Inappropriate apology
Misunderstandings

## Design Concept

Did you apologize in words when mistakenly stepped somebody's foot? Koreans tend to express apology ambiguously because of various reasons such as embarrassment. Can nodding or giving a slight gaze deliver the message of apology?

The Apology board game talks about the deep-seated problem of Korean culture, allowing players to look back on one's way of apology. A nonverbal apology cannot be understood. Apologize in words.

## Game Goal

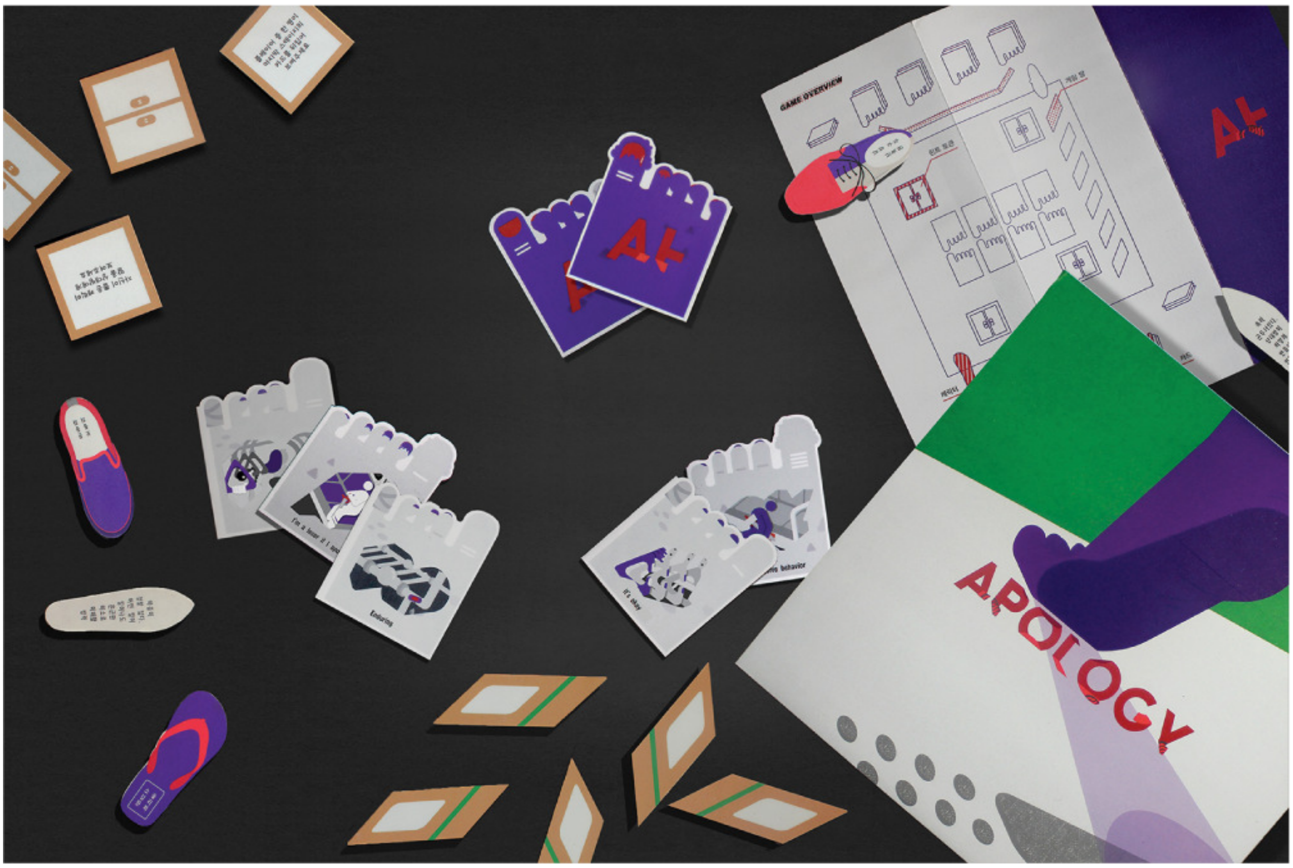
### Critical Design + Serious Game

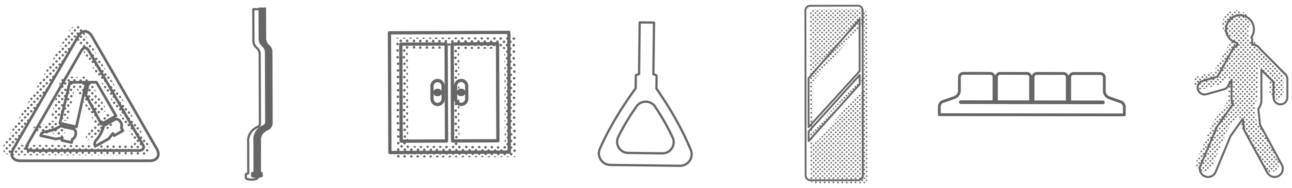
The two players are to match the 4 sets of cards with different apology responses while remaining in silence. The way of the game adversely gives a message that nonverbal apology can never be the solution to the problem one has caused.
With the approach of critical design and serious game, Apology board game tries to reveal the society deprived of apology.

Apology game composes of 2 sets of cards, 32 in total, 12 markers, 4 hint tokens, 5 different characteristics of the player to choose from, 2 hiding panels, and a game board.

APOLOGY

Logo

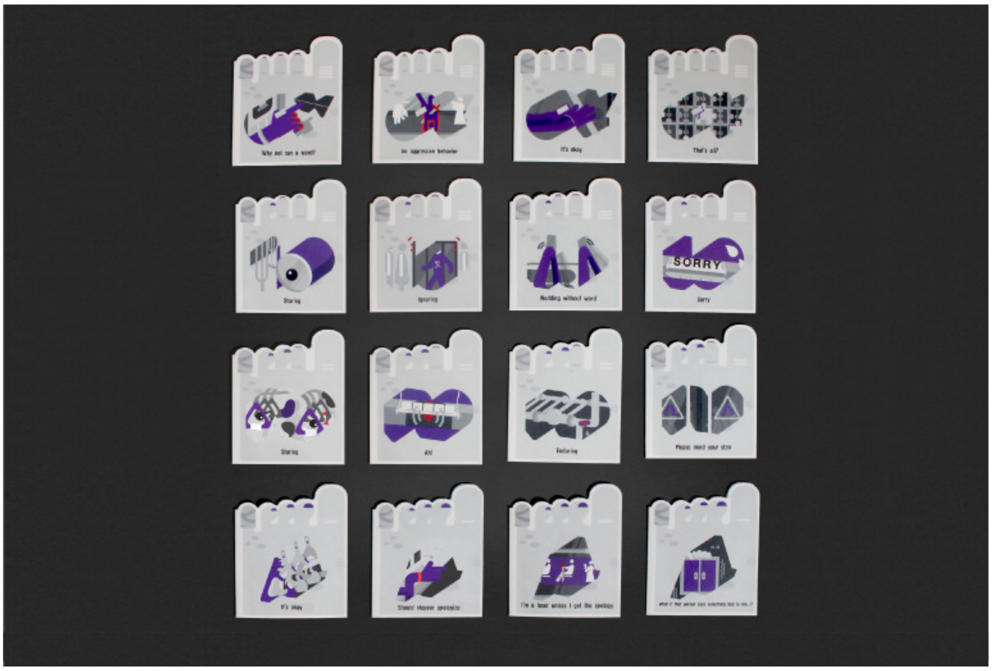

GAME OVERVIEW
APOLOGY

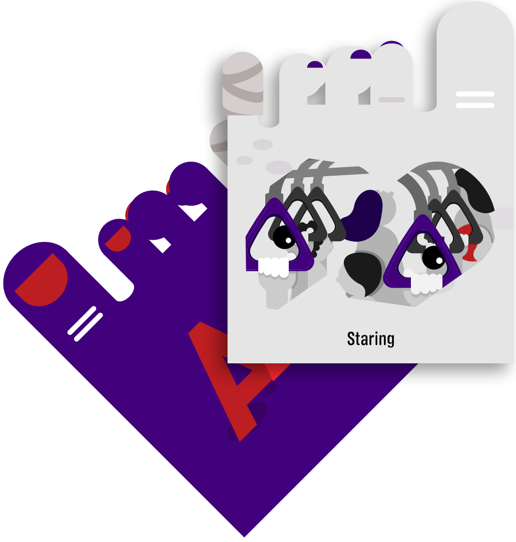


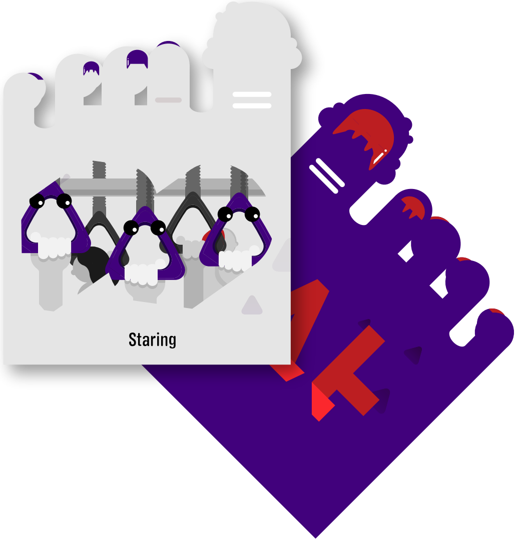
## Card Detail

The context of the illustration is inspired from the subway, where I underwent several experiences of getting stepped on by others, with no apology in return.

Illustrations are composed of elements in the subway such as handles, alert signs, seats, and more. .

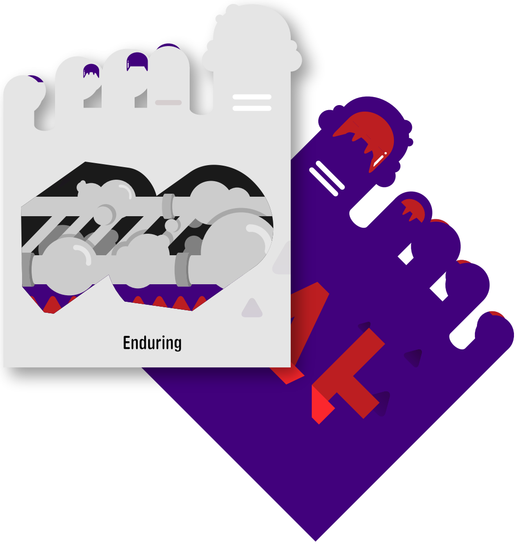


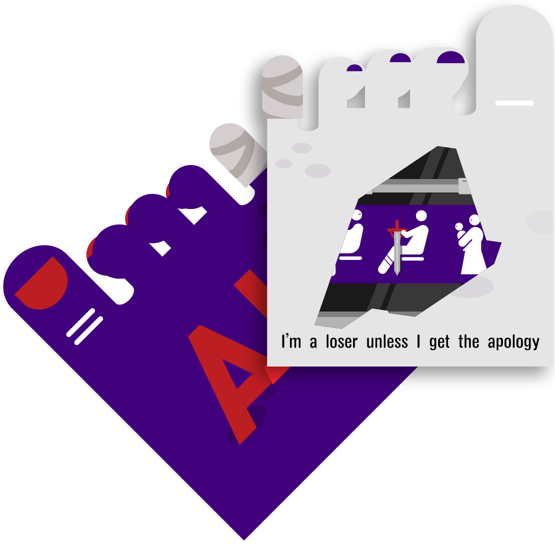


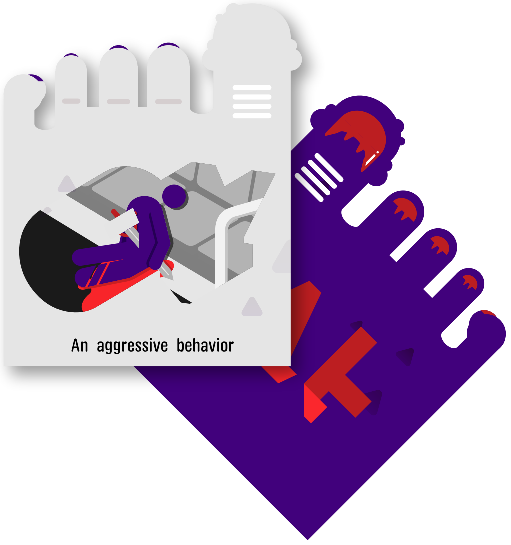


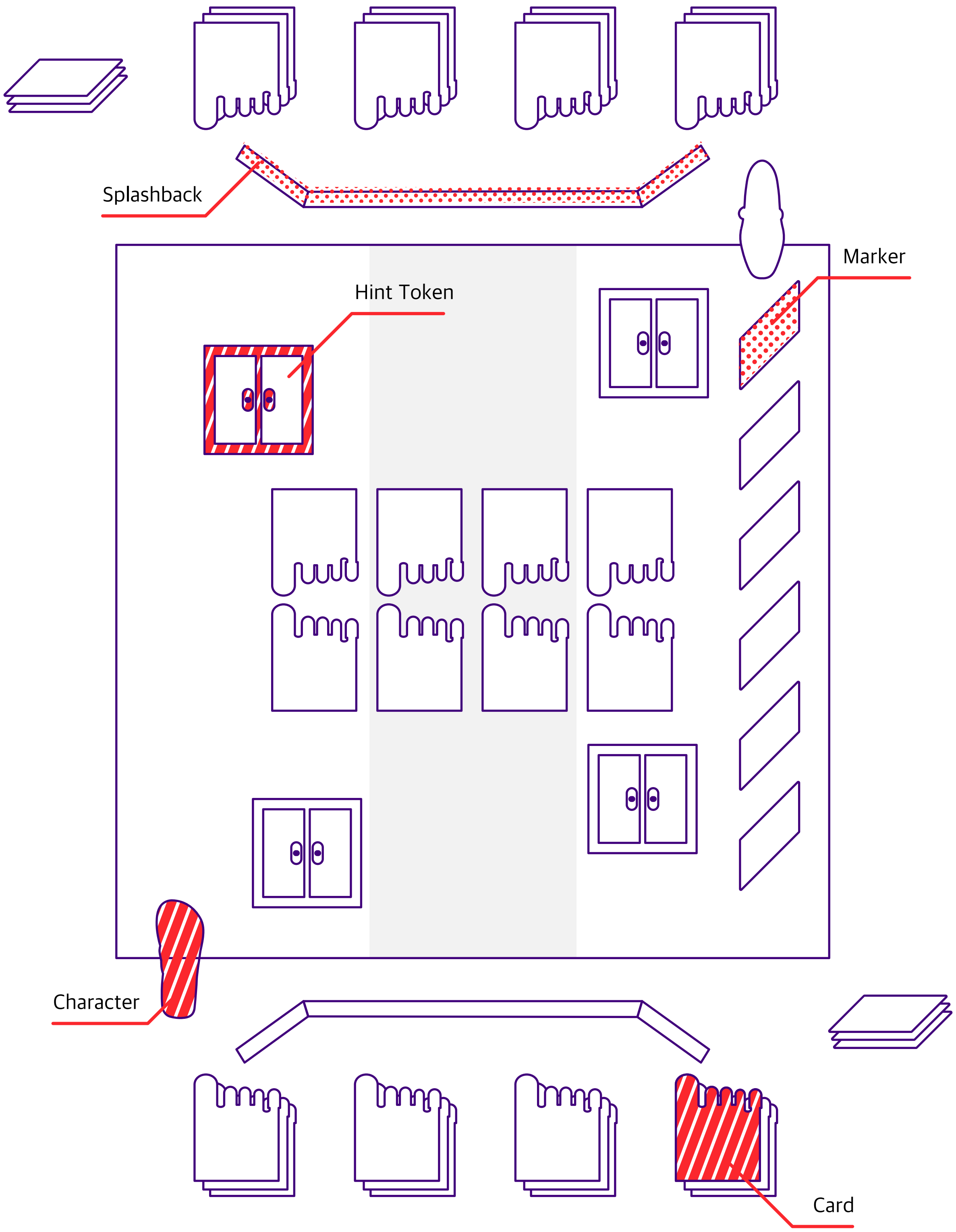
## Concept of Card Design

Cards in shape of a foot are separated into two different sets, one for the attacker and the other one for the victim. Each player has 16 cards, 4 cards each for each step. On the back of the card, there is an image describing the action a player can take.

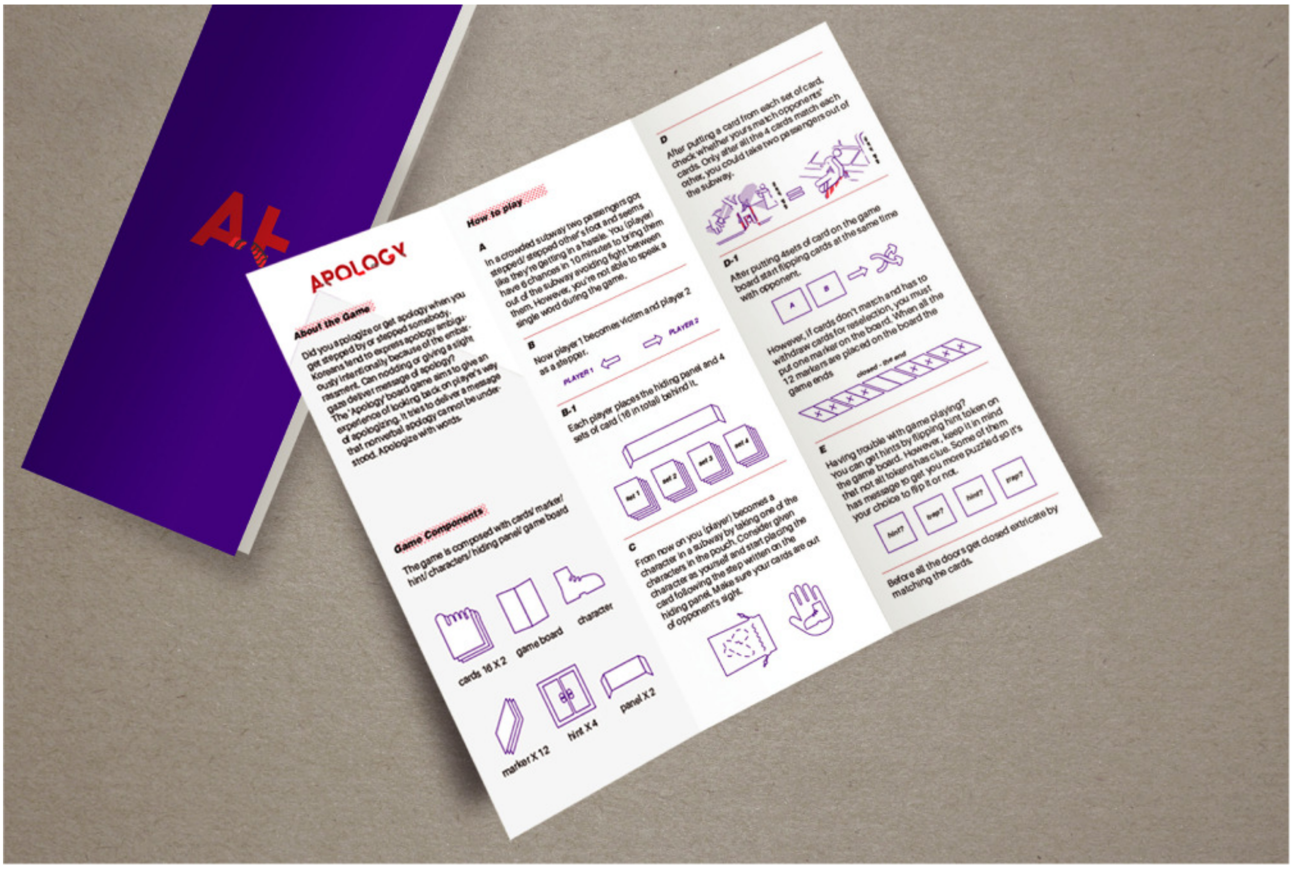



I'm a loser unless I get the apology


An aggressive behavior


Splashback
Hint Token
Marker
Character
Card

The game starts under the context of – inside a subway closely packed with people, where a passenger got stepped on the foot by another person.
Before this simple mistake gets big into a hassle, lead the person who got stepped to accept the apology.
At the start of the game, each player picks up a card of characteristic. On the back of the characteristic card shows the attitude that the game player has to take. During the whole process of the game, players have to remain in silence, proceeding the game through reading counterpart's face.
Within a given time and chances, 10 minutes and six chances respectively, players have to match four sets of apology cards to heal the breach. Players may pick up a token to search for hints, but there's also a trap among the tokens.



APOLOGY

**About the Game**

Did you apologize or get apology when you get stepped by or stepped somebody. Koreans tend to express apology ambiguously intentionally because of the embarrassment. Can nodding or giving a slight gaze deliver message of apology? The 'Apology' board game aims to give an experience of looking back on player's way of apologizing. It tries to deliver a message that nonverbal apology cannot be understood. Apologize with words.

**Game Components**

The game is composed with cards/ marker/ hint/ characters/ hiding panel/ game board

**How to play**

**A**
In a crowded subway two passengers got stepped/ stepped other's foot and seems like they're getting in a hassle. You (player) have 6 chances in 10 minutes to bring them out of the subway avoiding fight between them. However, you're not able to speak a single word during the game.

**B**
Now player 1 becomes victim and player 2 as a stepper.

**B-1**
Each player places the hiding panel and 4 sets of card (16 in total) behind it.

**C**
From now on you (player) becomes a character in a subway by taking one of the characters in the pouch. Consider given character as yourself and start placing the card following the step written on the hiding panel. Make sure your cards are out of opponent's sight.

**D**
After putting a card from each set of card, check whether your's match opponents' cards. Only after all the 4 cards match each other, you could take two passengers out of the subway.

**D-1**
After putting 4sets of card on the game board start flipping cards at the same time with opponent.

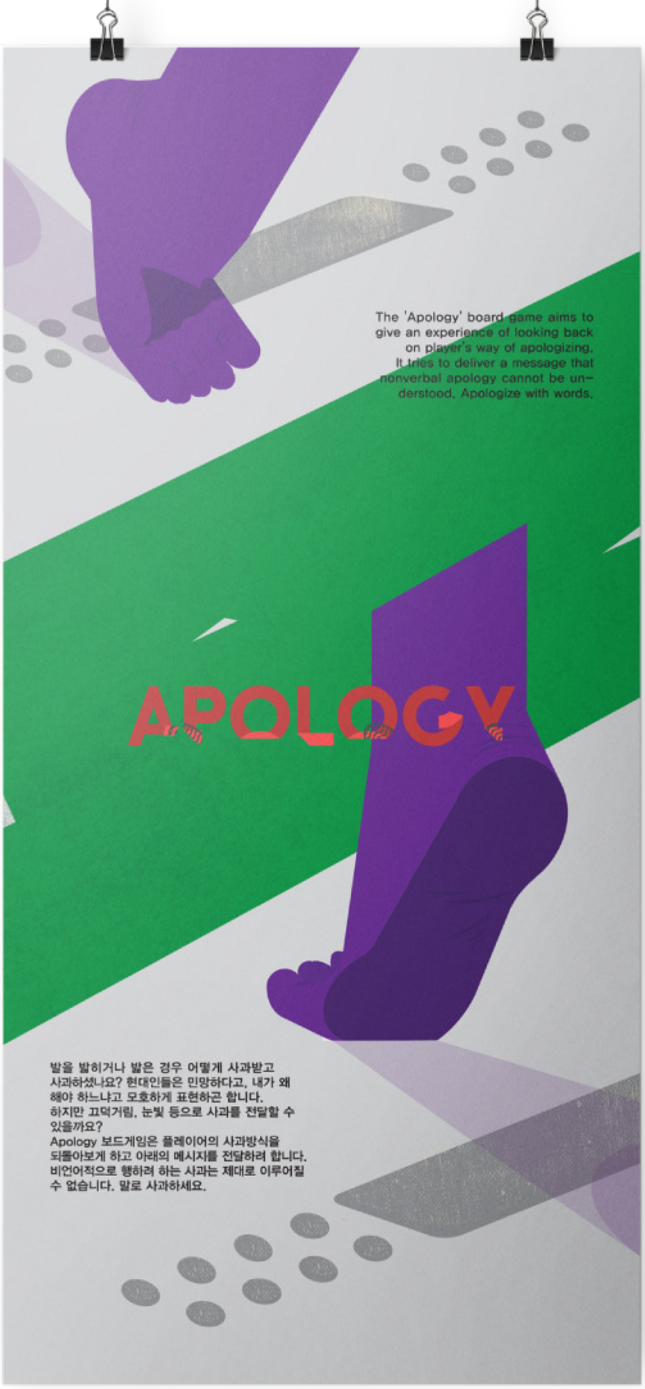
However, if cards don't match and has to withdraw cards for reselection, you must put one marker on the board. When all the 12 markers are placed on the board the game ends

**E**
Having trouble with game playing? You can get hints by flipping hint token on the game board. However, keep it in mind that not all tokens has clue. Some of them has message to get you more puzzled so it's your choice to flip it or not.

Before all the doors get closed extricate by matching the cards.

## Poster

Graduation exhibition poster on Apology Board Game.



The 'Apology' board game aims to give an experience of looking back on player's way of apologizing. It tries to deliver a message that nonverbal apology cannot be understood. Apologize with words.

발을 밟히거나 밟은 경우 어떻게 사과받고 사과하셨나요? 현대인들은 민망하다고, 내가 왜 해야 하느냐고 모호하게 표현하곤 합니다.
하지만 끄덕거림, 눈빛 등으로 사과를 전달할 수 있을까요?
Apology 보드게임은 플레이어의 사과방식을 되돌아보게 하고 아래의 메시지를 전달하려 합니다. 비언어적으로 행하려 하는 사과는 제대로 이루어질 수 없습니다. 말로 사과하세요.

## Graduation Exhibition

APOLOGY
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APOLOGY