Project Introduction

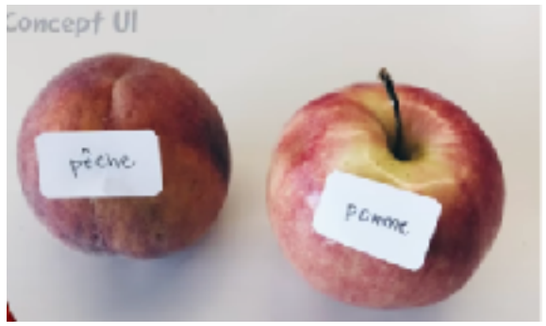
Jiaqi Wu UROP from Fudan University
Supervisor: Prof. Paul Lee
Project Members: Prof. Paul Lee, Jiaqi Wu, James Zhu,

Structure

- Motivations
- Research Questions
- Design of User Study

Quick Introduction: AR Prototypes

Exp: an AR app



Simulate by paper

Simulate by video

app demo/real app

Fidelity: Low

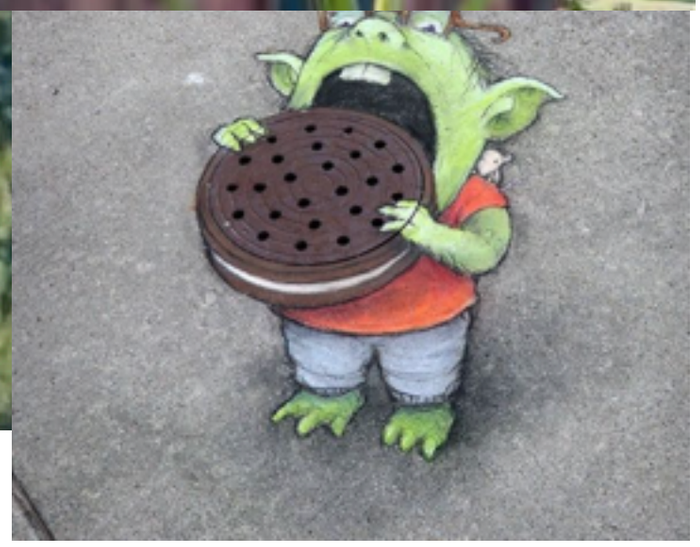
Fidelity: High

Show the effects without full development

Quick Introduction: AR Prototypes

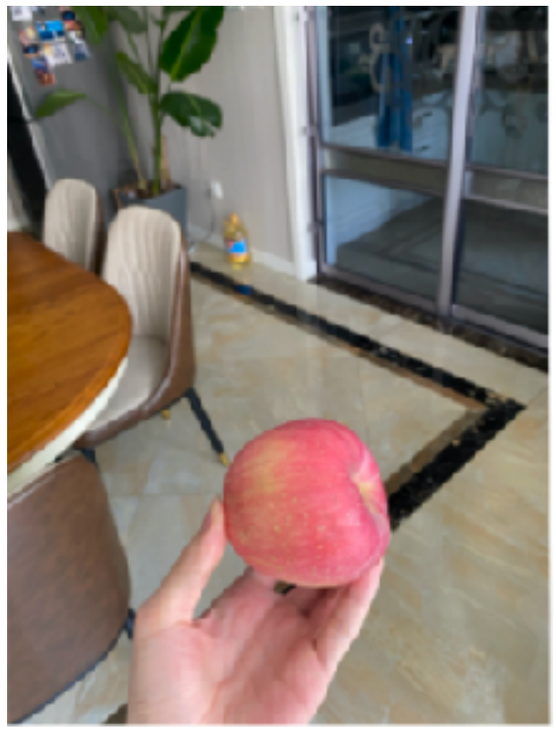
- we focus on the video AR prototypes without comprehensive functions but have impressive visual effects

Quick Introduction: Shape-based Art effects

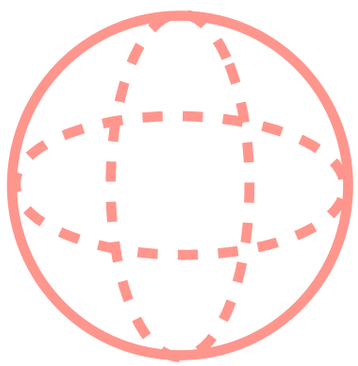


Quick Introduction: Shape-based Art effects

- Use imagination and shape association to add effects on existing object, making it a meaningful work.



2D? 3D? What does it look like?……



Motivation

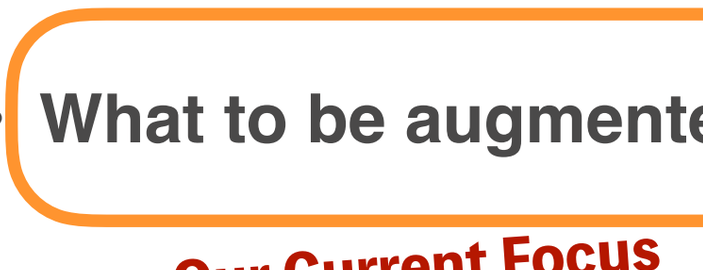
- Bring them together!
- **Shape Pronto : AR Prototypes** with **Shape-based Art effects**

Motivation

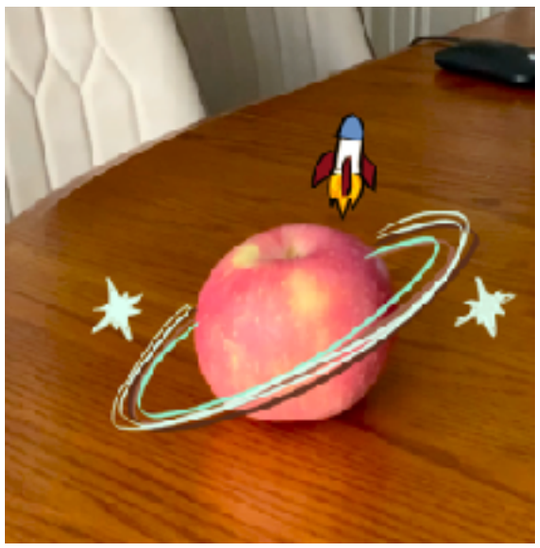
- 1. To explore the design space for **Shape Pronto**

- **What to be augmented**? → How to augment?

Our Current Focus



?



Research Questions

- How can we help users to find suitable Shape pronto efficiently?
- How can we facilitate users creating their own Shape pronto ?

Potential implementation field: AR ads, imagination inspiration, Art education

Workflow& Frameworks

Our Current Focus

- Phase 1:
  - User study, find the design strategy for Shape pronto and make evaluations. (more HCI)

- Phase 2:
  - With the outcomes phase 1, build the recommendation system for quick generation or user-defined Shape pronto (more AI)

Design of User Study

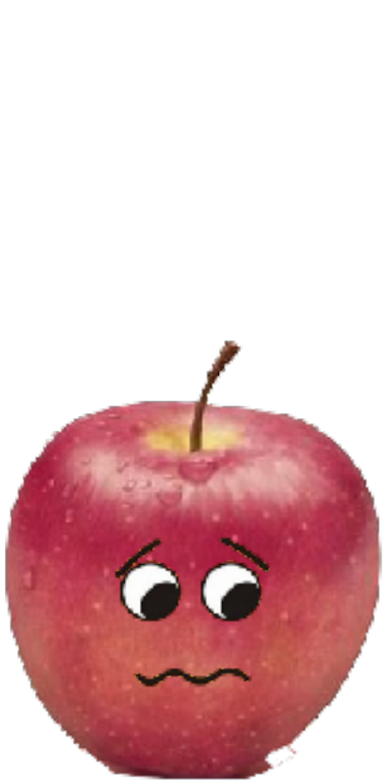
- We choose everyday living objects with common shapes
- Focus on 2D shapes and effects

Regular			Iregular			
						
						

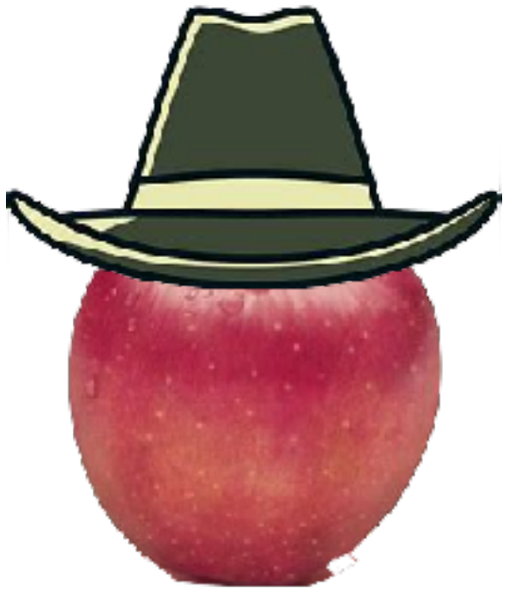
- Reference: textbooks , wikipedia

Design of User Study

- We classify Shape Pronto effects into three main categories:



- Inner

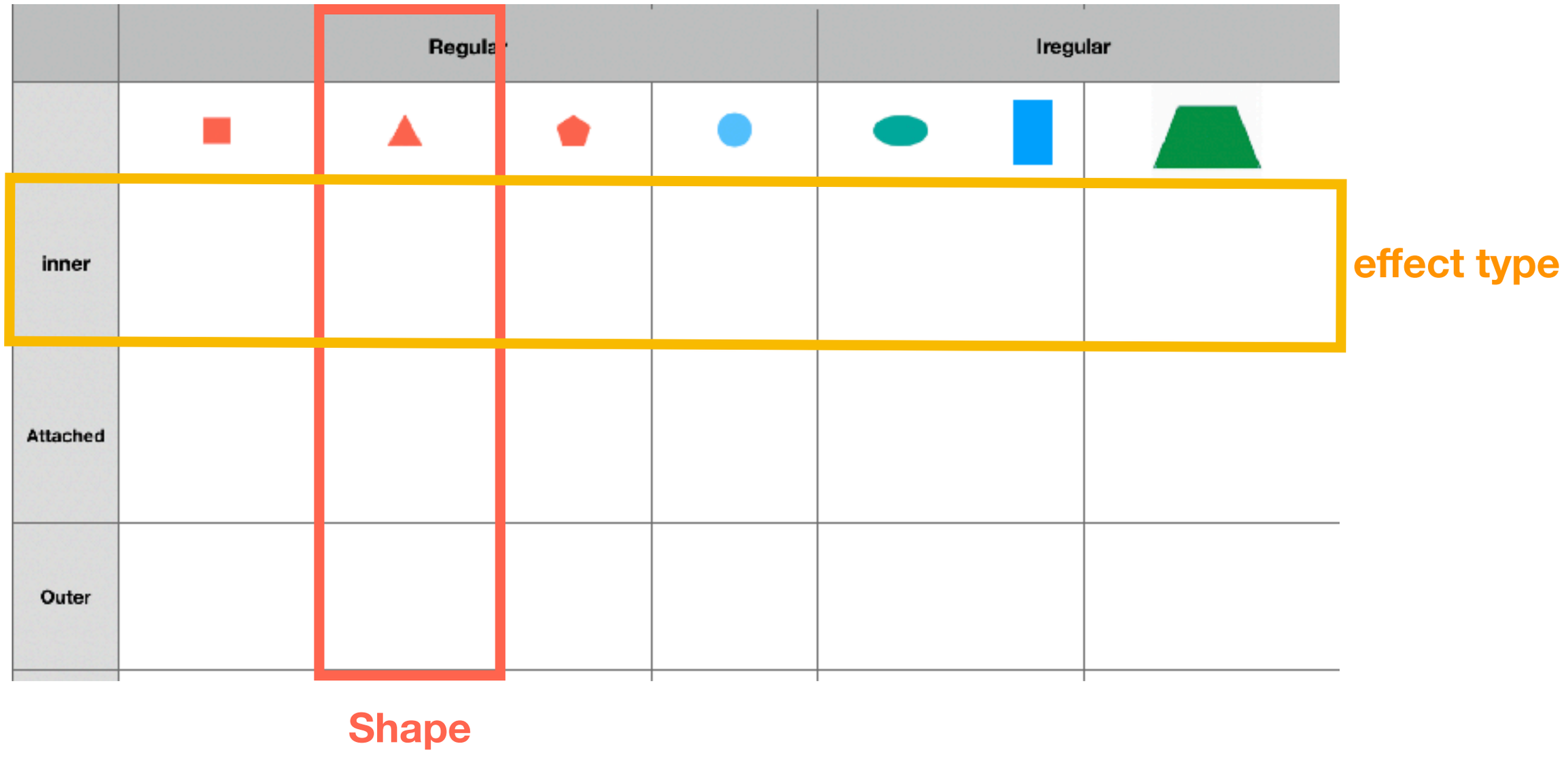


- Attached

- Outer

Design of User Study

- We built a 7*4 table as our framework



Design of User Study

- We defined a set of themes:

  T1: Figure

  T2: Animal

  T3: Building

  T4: Food

  T5: Botany

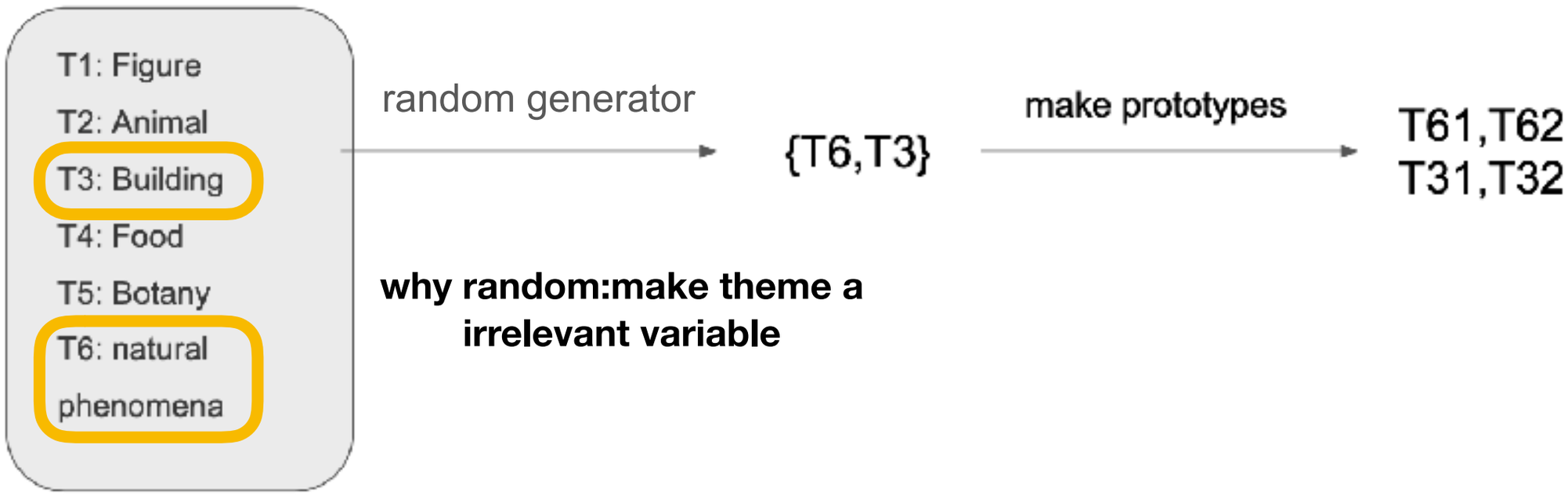
  T6: Natural scenery

Design of User Study ——EXP1

- We start at the box1: Square+Inner

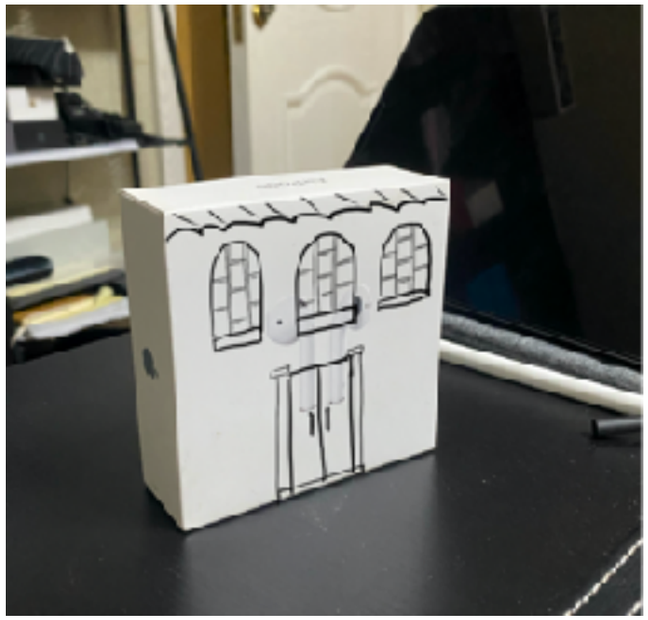
Design of User Study ——EXP1

Step1: For each box, for exp: square+inner

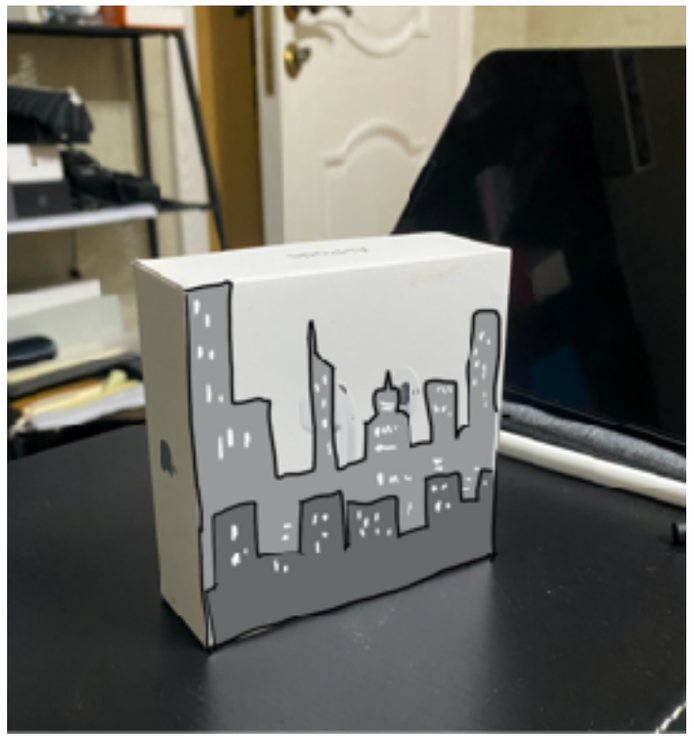


why random:make theme a irrelevant variable

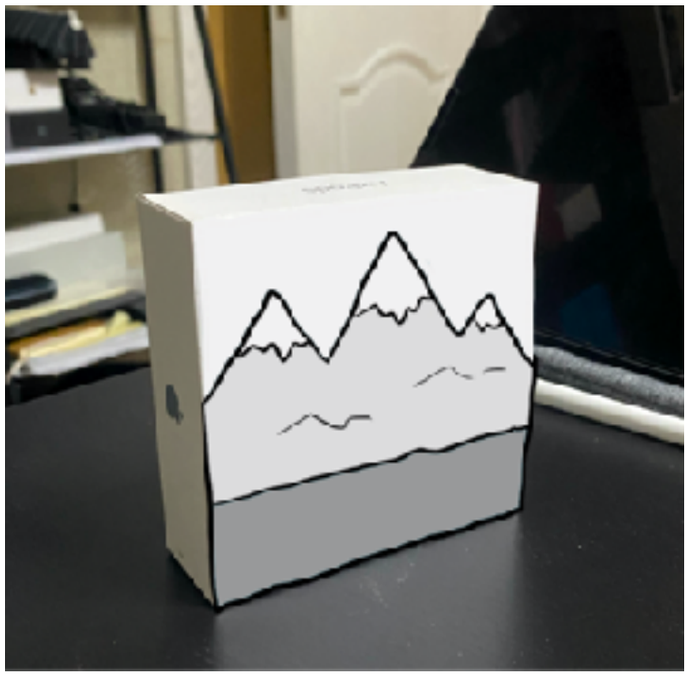
Design of User Study ——EXP1



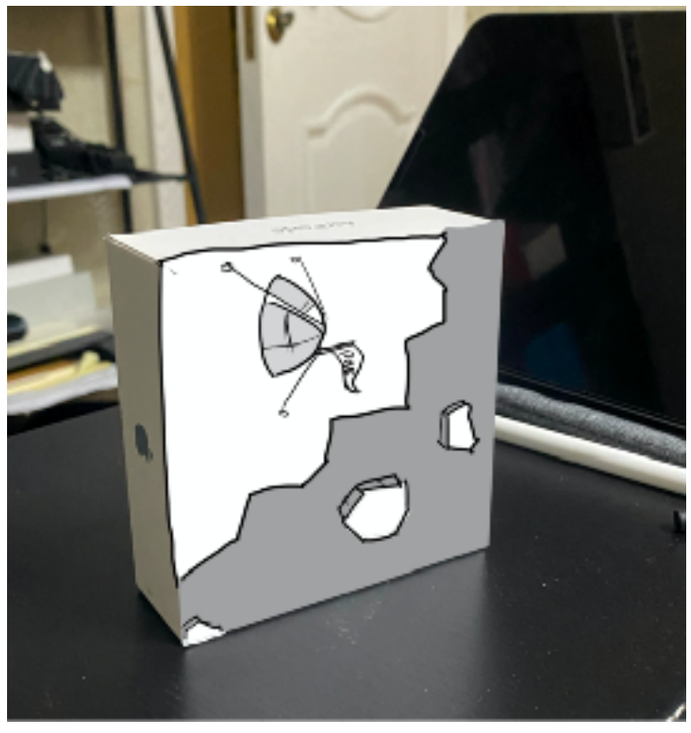
T61



T62



T31



T32

Design of User Study ——EXP1

professional Designer:

Step1: For each box, for exp: square+inner

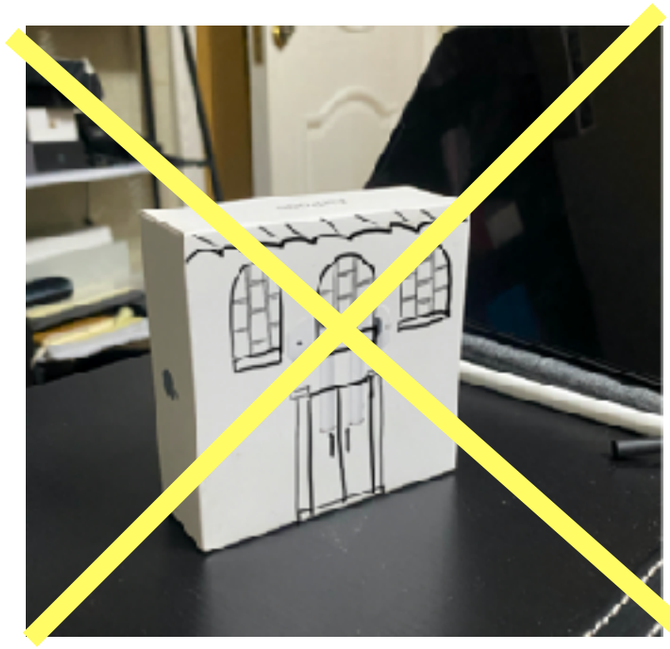
T1: Figure
T2: Animal
T3: Building
T4: Food
T5: Botany
T6: natural phenomena

random generator → {T6,T3}

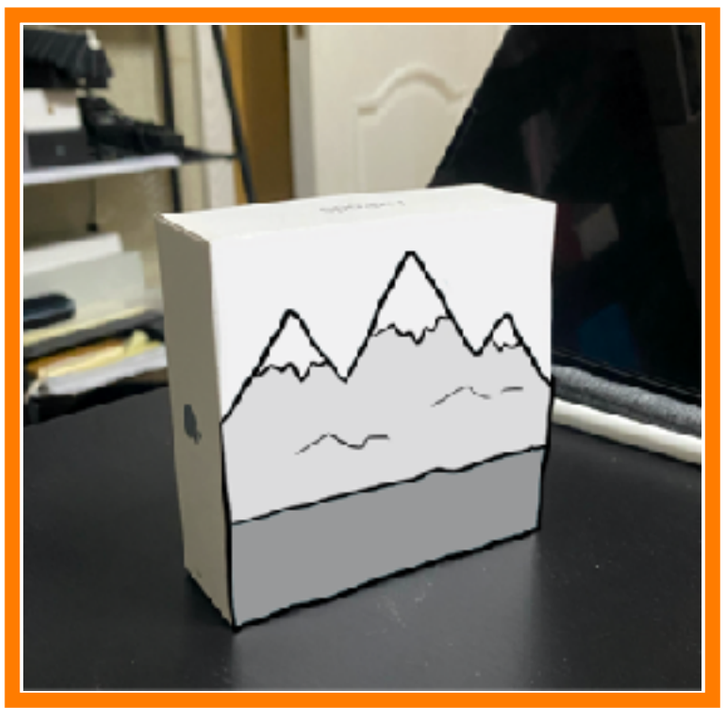
make prototypes → T61,T62 T31,T32

why random:make theme a irrelevant variable

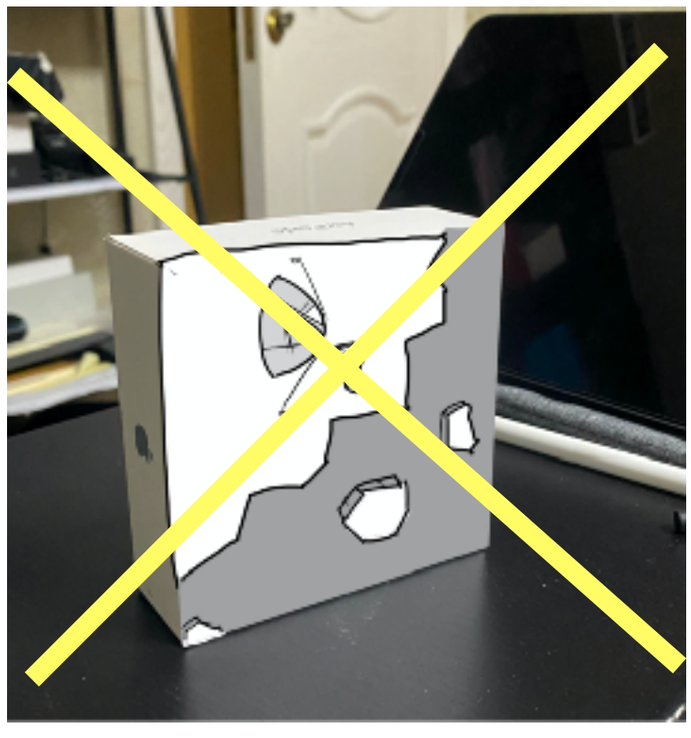
Design of User Study ——EXP1



T62



T31



Design of User Study ——EXP1

- Finish the preparation for the first box

	Regular					Iregular	
inner	T62,T31						
Attached							
Outer							

Design of User Study ——EXP1

- Repeat the process for every box

	Regular					Iregular	
							
inner	T62,T31	T??,T??	T??,T??	T??,T??	T??,T??	.....	.....
Attached	.....	.....	.....	.....	.....	.....	.....
Outer	.....	.....	.....	.....	.....	.....	.....

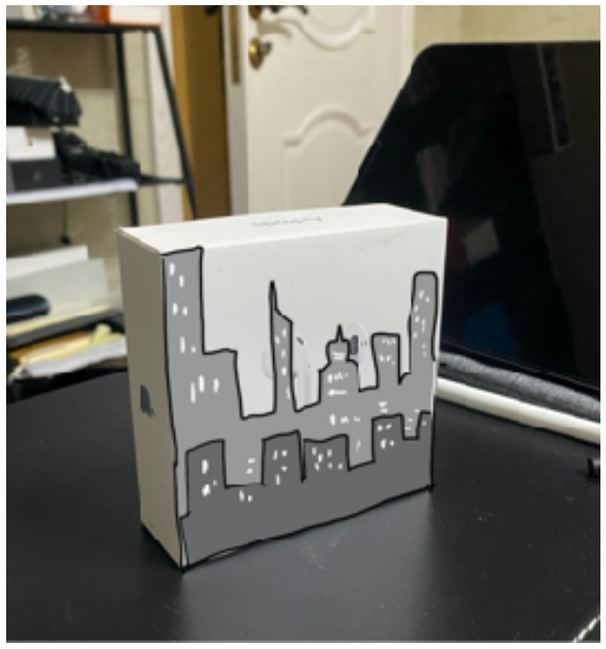
Design of User Study ——EXP1

Conduct user study for the first box

	Regular					Iregular	
							
inner	T62,T31	T??,T??	T??,T??	T??,T??	T??,T??	.....	.....
Attached	.....	.....	.....	.....	.....	.....	.....
Outer	.....	.....	.....	.....	.....	.....	.....

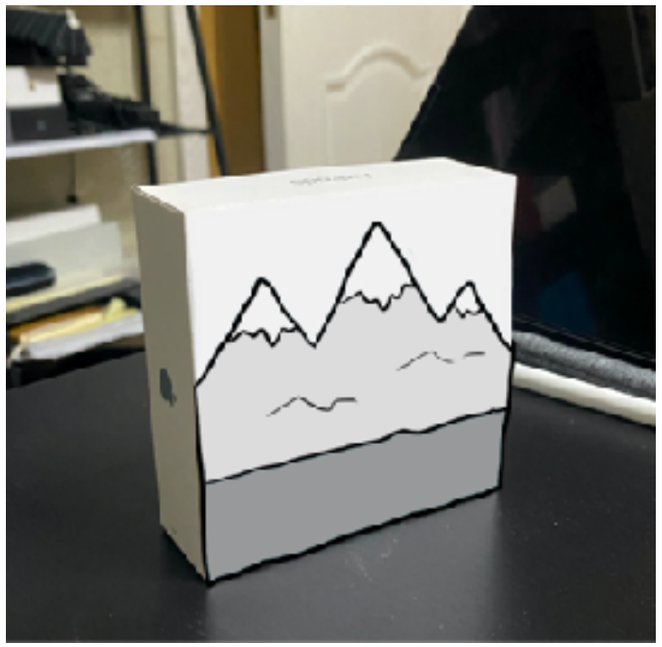
Design of User Study ——EXP1

Conduct user study for the first box



Rate: R11

FinalRating: R1



Rate: R12

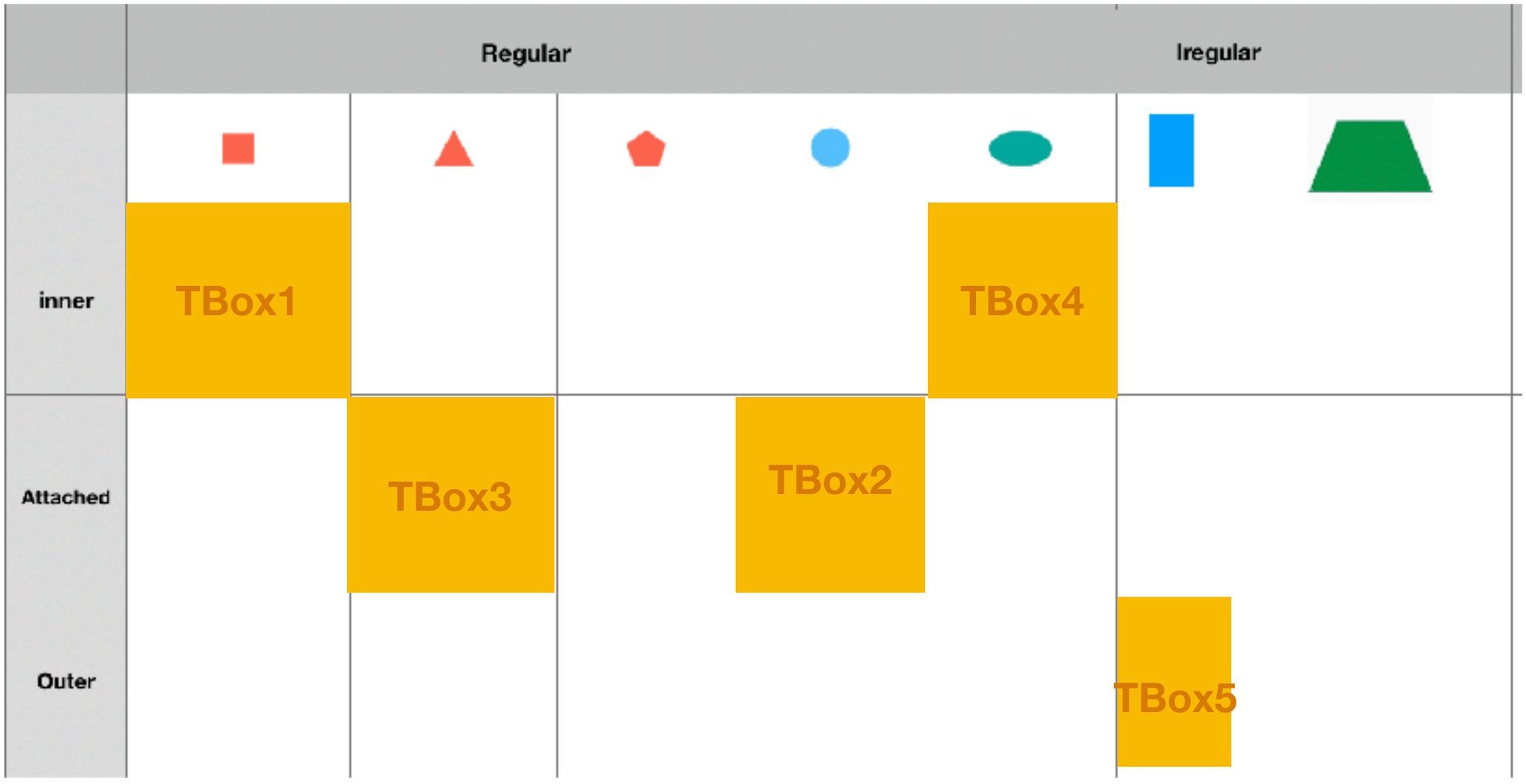
Design of User Study ——EXP1

Repeat the process , get ratings for every box

	Regular					Iregular	
							
inner	T62,T31 R1	T??,T?? R2	T??,T?? R3	T??,T?? R4	T??,T?? R5	.....	.....
Attached	.....	.....	.....	.....	.....	.....	.....
Outer	.....	.....	.....	.....	.....	.....	.....

Design of User Study ——EXP1

Choose top-5 box with highest ratings



Design of User Study ——EXP1

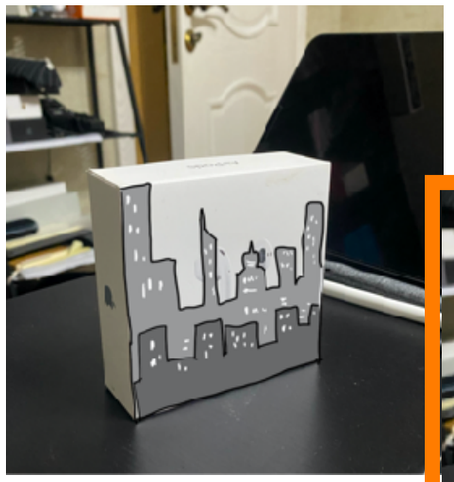
Choose top-5 box with highest ratings

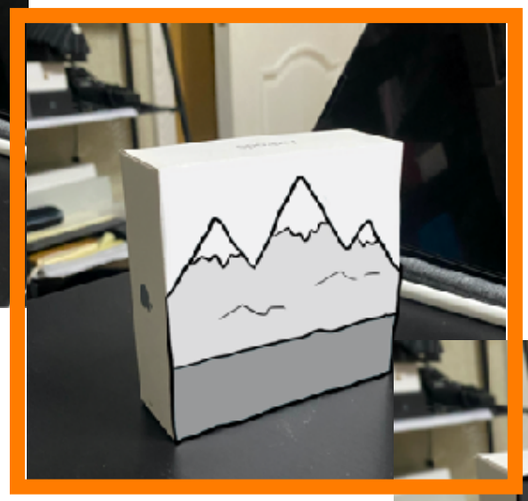
TBox1 : Square + Inner	TBox2 : Circle + Attached	……	TBox5:…..

Design of User Study ——EXP1

Start from TBox1, we make shape pronto for all the 6 themes

TBox1:Square + Inner	TBox2:Circle + Attached	……	TBox5:…..





Design of User Study ——EXP1

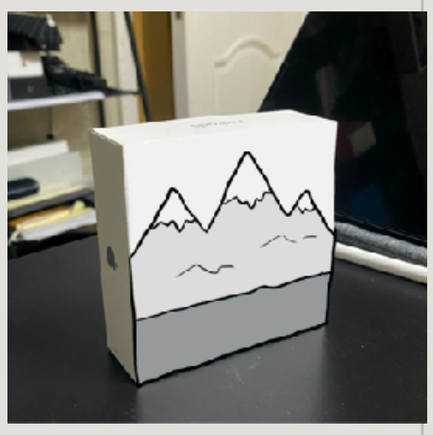
For TBox1, Then we ask users to rate each shape pronto,

then find top-2 shape pronto

TBox1:Square + Inner	TBox2 : Circle + Attached	……	TBox5:…..
1. 			
2. 			

Design of User Study ——EXP1

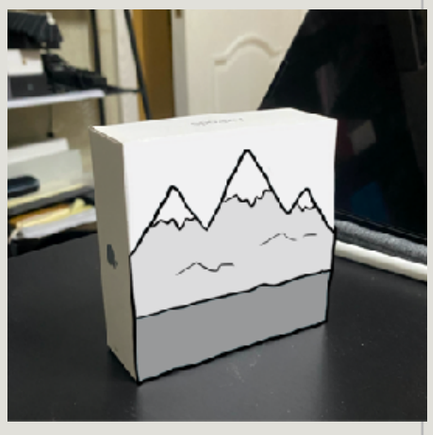
Repeat the process for each boxes

TBox1:Square + Inner	TBox2 : Circle + Attached	……	TBox5:…..
1.	1. 	1. ……	1. ……
2. 	2. 	2. ……	2. ……

Design of User Study ——EXP1

Finally we get a list of best combinations

combinations : (shape + effect type + theme)

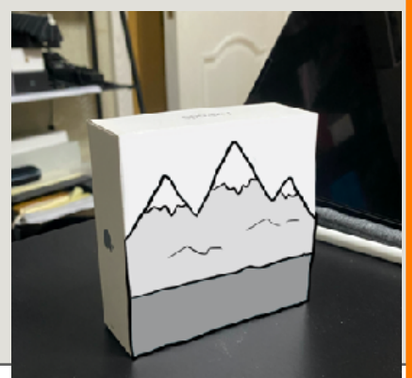
TBox1:Square + Inner	TBox2 : Circle + Attached	……	TBox5:…..
1.	1. 	1. ……	1. ……
2. 	2. 	2. ……	2. ……

Design of User Study ——EXP2

Another group of Users

For each user,

Randomly select 2 boxes

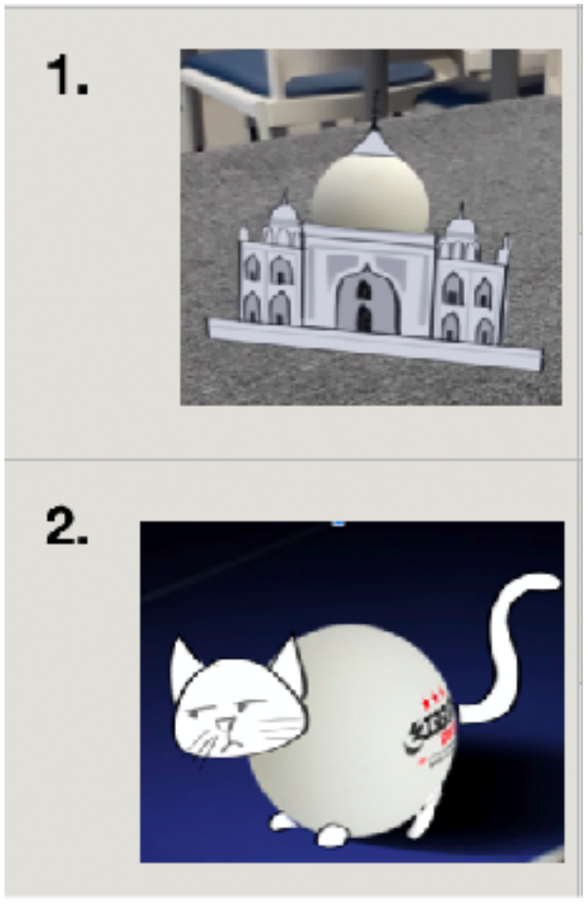
TBox1:Square + Inner	TBox2 : Circle + Attached	……	TBox5:…..
1. 	1. 	1. ……	1. ……
2. 	2. 	2. ……	2. ……

Design of User Study ——EXP2

For each box,

1. user design prototypes

Caculate Cost
Evaluate quality

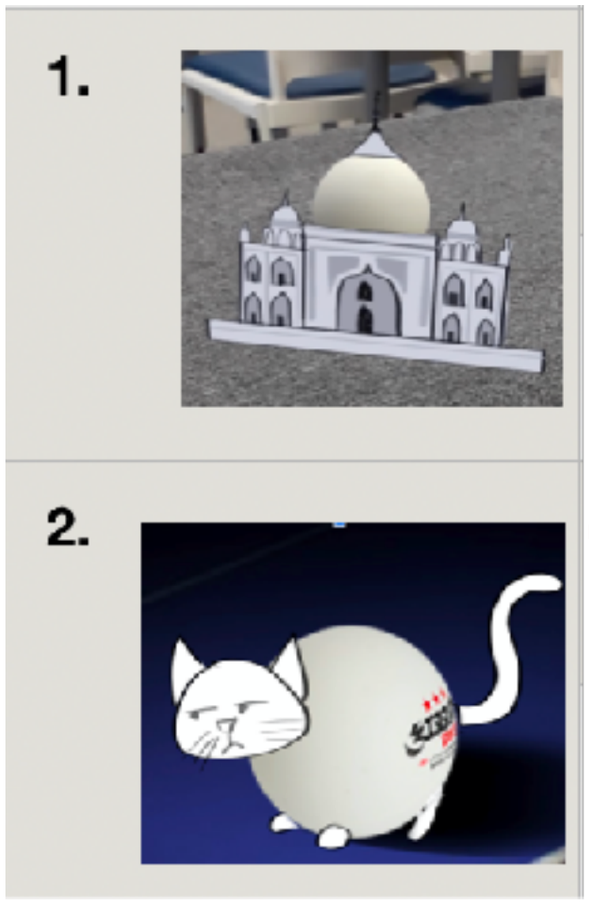


2. Show user best combinations

3.User design prototypes again

Caculate Cost
Evaluate quality

Design of User Study ——EXP2



1. user design prototypes

2. Show user best combinations

3.User design prototypes again

Caculate Cost
Evaluate quality

Caculate Cost
Evaluate quality

Design of User Study ——Conclusion

- During the 2 experiments of the user study, we will:
  - Explore a systematic optimization method for the design space of shape pronto
  - Get a list of best combinations of all the possibilities inside our framework
  - Evaluate the quality of representative shape pronto, which are helpful for building the recommendation system
  - Examine our design space can facilitate users creating their own shape pronto

Thanks a lot for your time!