

# **Assessment Task 4: Portfolio**

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**Steam** B  
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# Introduction

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## Problem statement



Nowadays, the modes of travel are increasing, traffic accidents rate are also increasing. Pedestrians are the main and weak victims of traffic accidents, as their perception of the road environment is perceptual. The most accidents happens during nighttime, as there is less vehicles on the road, pedestrian may crossing the road unsafely. As the long waiting time exceeds the psychologically affordable time of pedestrians, which caused them to lose patience and illegally cross the road.

## Final concept



Our final design concept is press the button to pump up the balloon, it's a very simply game and clear game instruction just press the button. User has clear expectation as expect that when the balloon expands to a certain degree, it will explode. The game builds expectations through common sense and what they see in everyday life and press buttons that people can't refuse. This simply game not only reduce pedestrian's bored time encourage them to wait for traffic light, also help pedestrians release stresses.

# Team Structure

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**Yan Jiang**



**Leader and programmer, manage the think process**

**Ziqi Bai**



**Designer and programmer, focuses on creativity, the possibilities, alternatives, and new ideas.**

**Yi Ye Cindy He**



**Designer and programmer, focuses on creativity, the possibilities, alternatives, and new ideas.**

**Shiting Li**



**Ideation and programmer, focuses on creativity, the possibilities, alternatives, and new ideas.**

# Team Structure

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## Designer



## Programmer



- Ideation and develop design concepts after receiving user feedback
- Using Illustrator to create concepts and rendering image
- Building prototypes

## Documenter



- Documenting the design concepts
- Writing introductions and summing up results

## Market Researcher



- Doing the user testing
- Interview user to receive feedback and improving the concept

# Contributions

In task 1, I was working on background research, concept 2, hardware and software requirement for concept 2.

### Background Research -Cindy

#### Road traffic crashes at night

- Road traffic crashes are main cause of death and injury, especially in developing countries.
- It is estimated that road traffic injuries will become **third world disease burden rankings by 2020**, and 2.3 million people died per year in globally.
- Street lighting and traffic light has been suggested as a low-cost intervention with the potential to prevent traffic crashes.
- According to Fiona R Beyer and Katherine Ker's research, the result shows street lighting and traffic light may improve a driver's visual capabilities and ability to detect roadway hazards.
- Street lighting and traffic light may also have an **bad influence** on road safety, drivers may feel safer as street lighting makes them gives better visibility which could allow them increase speed and reducing concentration. (Fiona R Beyer, Katherine Ker 2009)

(Transportation Kentucky Transportation Center Research Report Traffic Accidents: Day Versus Night By Donald R. Herd, Kenneth R. Agent, Roland L. Rizenberg's Table 13)

LIGHT CONDITIONS	PERCENT INJURY ACCIDENTS	PERCENT FATAL ACCIDENTS
Daylight	9.7	0.14
Dawn	9.4	0.67
Dusk	11.6	0.22
Darkness	14.4	0.53



According to the table above, the rate of road traffic injured was found to **increase** during the nighttime.

The percentage of fatal accidents during nighttime was nearly four times compare to the daytime. As accidents are likely to occur when the driver don't have enough sleep or is driving during their normal hours of sleep.

Drivers are **four times more likely** to have a fatal crash caused by **fatigue**. Fatigue can influence a driver's judgement and performance, as well as reduce their attention and concentration.

## Background research

### Hardware & Software Requirements

#### Blooming flower projection (Ziqi Bai)

Software:  
The design will run on Windows and projector  
We will need Adobe Suite, atom and Processing as software  
The programming language we will use P5JS, C++  
Hardware:  
In this design, we used the motion sensor, projection and Bluetooth. The motion sensor is used to track the user's movements, then the data is transmitted via Bluetooth, and the motherboard is connected to Bluetooth and a computer. The projection will put the design to the ground

#### Virtual scatter petal game (Cindy)

Software:  
The design will run on Windows and leap motion  
We will need Adobe Suite  
The programming language we will use C++  
Hardware:  
In this design, we used leap motion, holographic projection, Bluetooth and mainboard. We use the leap motion to identify the user's gestures and the data is transmitted using Bluetooth. The motherboard is connected to Bluetooth and a computer. The projection will project something of the design

#### Title: Jump for the less red-light time(Shirley)

Software:  
The design will run on Windows and projector  
We will need Adobe Suite  
The programming language we will use Java  
Hardware:  
In this design, we used the motion sensor, projection and Bluetooth. The motion sensor is used to track the user's movements, then the data is transmitted via Bluetooth, and the motherboard is connected to Bluetooth and a computer. The projection will put the design to the ground

## Hardware and software requirement

### Virtual scatter petal game - Cindy

#### Concept 2

**Scene of using the device**

- Sidewalk waiting area at night

**Target population**

- Pedestrians crossing the road at night



#### Design problem

According to our background research, the rate of road traffic injuries caused by pedestrians crossing the road at nighttime is 4 times higher compare to the day time especially between 10pm to dawn. As at night there are less car compare to daytime so pedestrians think it is safe to crosses the road and ignore the traffic light.

#### How would it solve the problem?

This virtual scatter petal game is designed to encourage pedestrians to wait for traffic lights at night instead of crossing the road. Our design idea is to create a virtual interactive game in the waiting area. The game can attract pedestrians' attention, motivating them to wait for traffic lights at night instead of crossing the road.

### Virtual scatter petal game - Cindy

#### VS

#### Virtual scatter petal game - Cindy

**Virtual scatter petal game**



**Offline Dino jumper: jump the cars**



#### Advantage

- Novel game with holographic projector and leap motion stimulate pedestrian's curiosity.
- Use holographic projector to deliver a three-dimensional flower pattern makes the flower looks more realistic.
- Use leap motion allow pedestrians to pick petals with their hands and fingers as input, but requires no hand contact or touching.
- Interactive game, motivating pedestrians to play game wait for traffic light instead of crossing road and make them feel less bored.

#### Limitation

- Only one person can play at a time, user may feel isolated.
- May cause crowd gathering and traffic congestion
- Components require high cost, and has risk to be stolen by others.

#### Advantage

- Requires no network
- Low cost
- Can reduce bored feel

#### Limitation

- Less interactive
- Requires user to shake the head to participate in the game and record the score by themselves user may feels boring.

#### Concept 2

#### Structure

- presented in the form of a rectangular showcase
- Screen placed at the base of showcase
- Holographic projector placed at the top of showcase
- Leap motion sensor to the screen, and placed at outside of the holographic projector

#### This facility consists of four main components

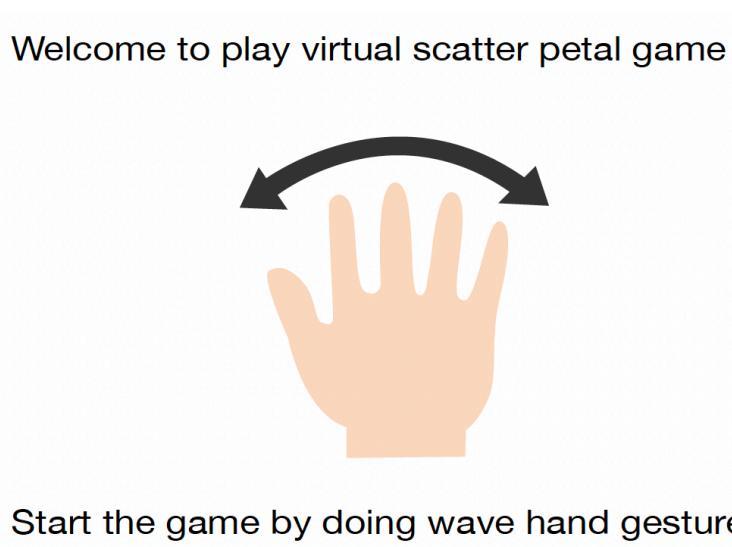
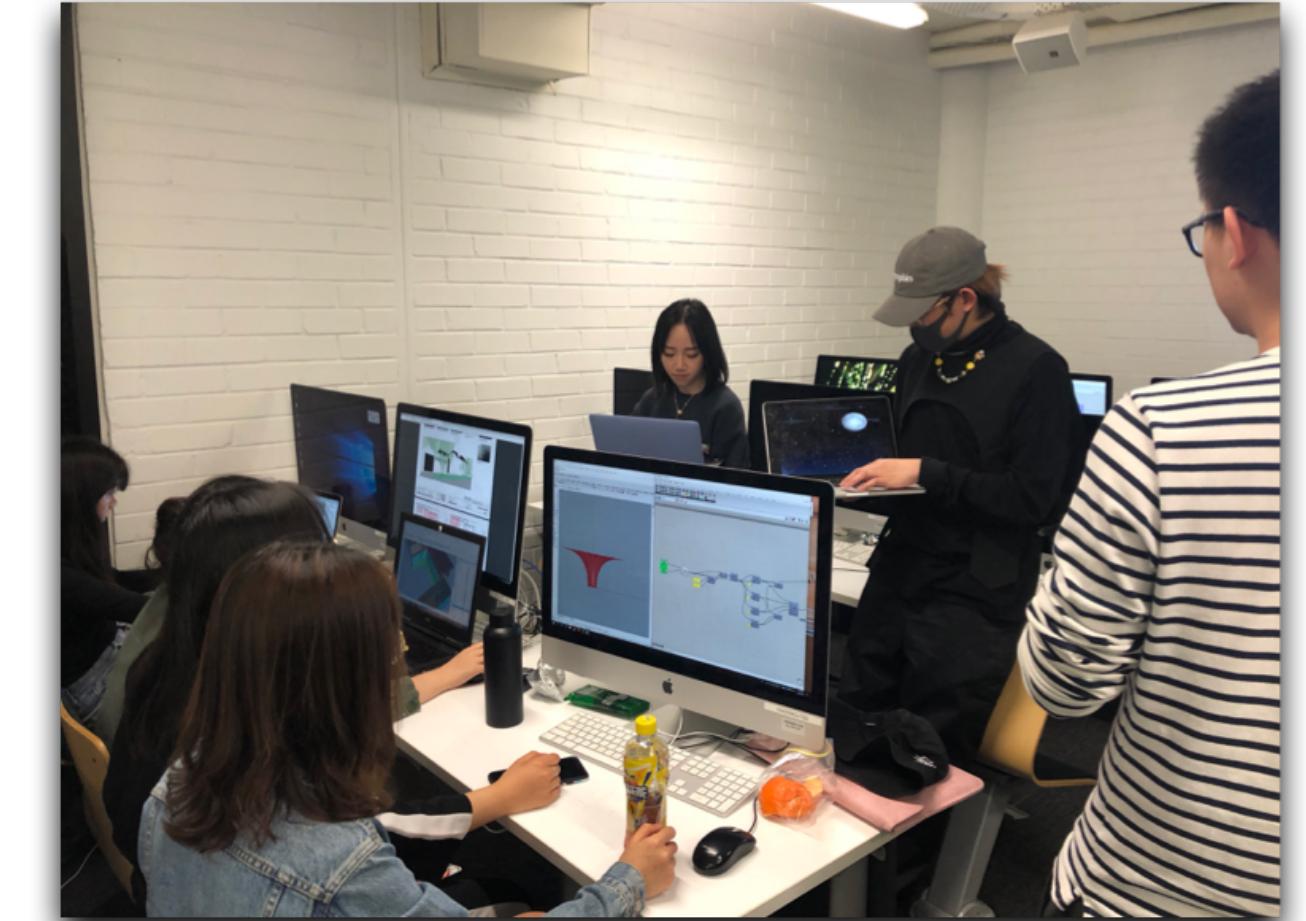
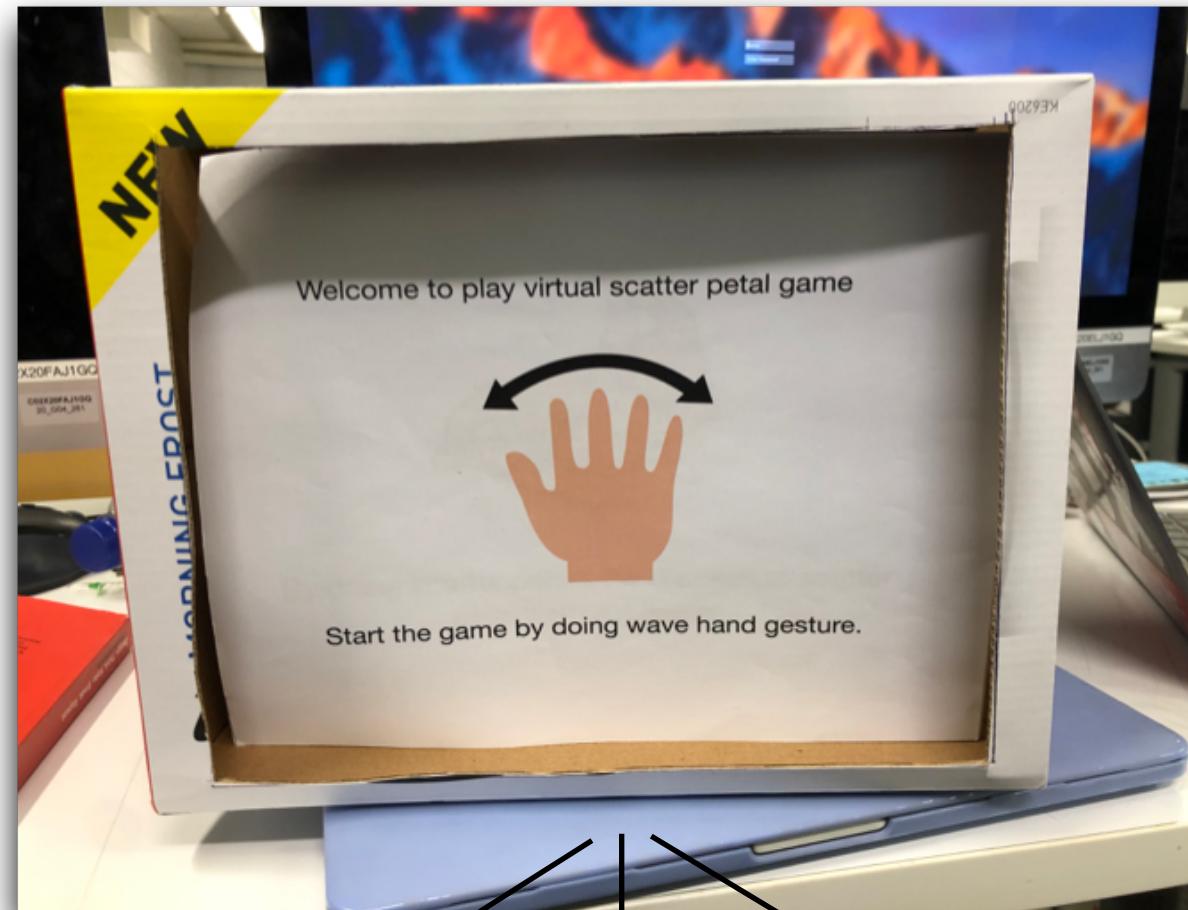
- Holographic projector
- Screen
- Rectangle showcase
- computer hardware sensor device

I've come up idea for concept 2, comparing it with exiting product and using illustrator to create the rendering image

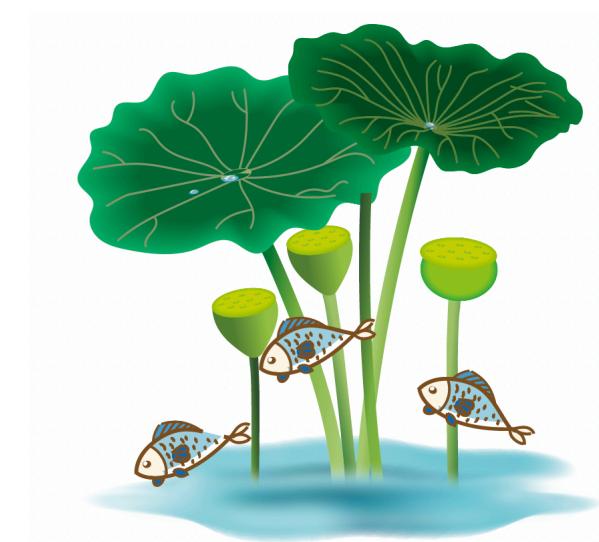
# Contributions

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in task 2, I am responsible to keep developing and making prototypes for concept 2 (Virtual scatter petal game). I also worked on user research such as interviewing and focus group. For report we documenting our work together.



By doing scatter petal's hand poses to scatter petal from the flower.



# Contributions

For report, I wrote overview of design process and future work

Setting up the site, testing and programming the prototype

### Overview of design process

Based three rounds of testing on our three concepts, we've improved and developed our final concept in assessment 2. The final concept we've chosen is "Blooming flower projection", the flower will bloom when motion sensor detects that the pedestrian has a foot lift. In order to make the design more attractive, we've added different themes to the design.

After receiving tutor's feedback we realised our design concept has lack of expectation, the flower just keeps blooming after sensor detected pedestrian has a foot lift. There are unclear endings in this concept, user don't know what will happen in the end. This will result reduce the attractiveness of the game and create unhappy user experience, as user unsure when will it end and what is the end.

Need to achieve

- Stimulate user's expectation, attract them to interact with our design
- Have a clear ending, also it's intuitive and simple game.
- Simply rule, as trivial rules will reduce user interest.

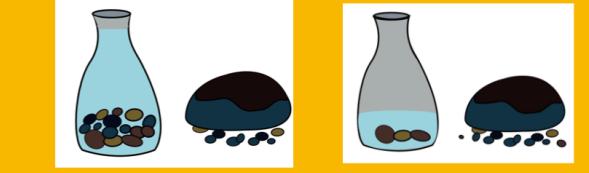
### Overview of design process

Follow this direction, we've come up with many design concepts, based on press button to complete the game.

Press the button to blow boom



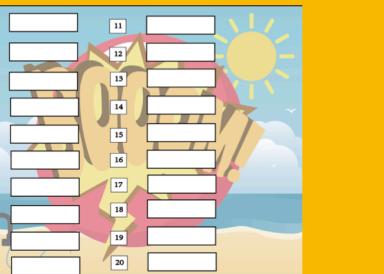
Press the button to fill up the water



### Future work/versions

Due to the limitation of time period and our skills, we couldn't make the design complete. For the future work we're planning to add more functions and polishing the aesthetics of the game to make it more attractive and interactive.

Adding ranking system to stimulate user's desire to win the game. The ranking system will refresh each week and the name of top 20 users who used the shortest time to explode balloon will be shown on our ranking system after user finished playing the game.



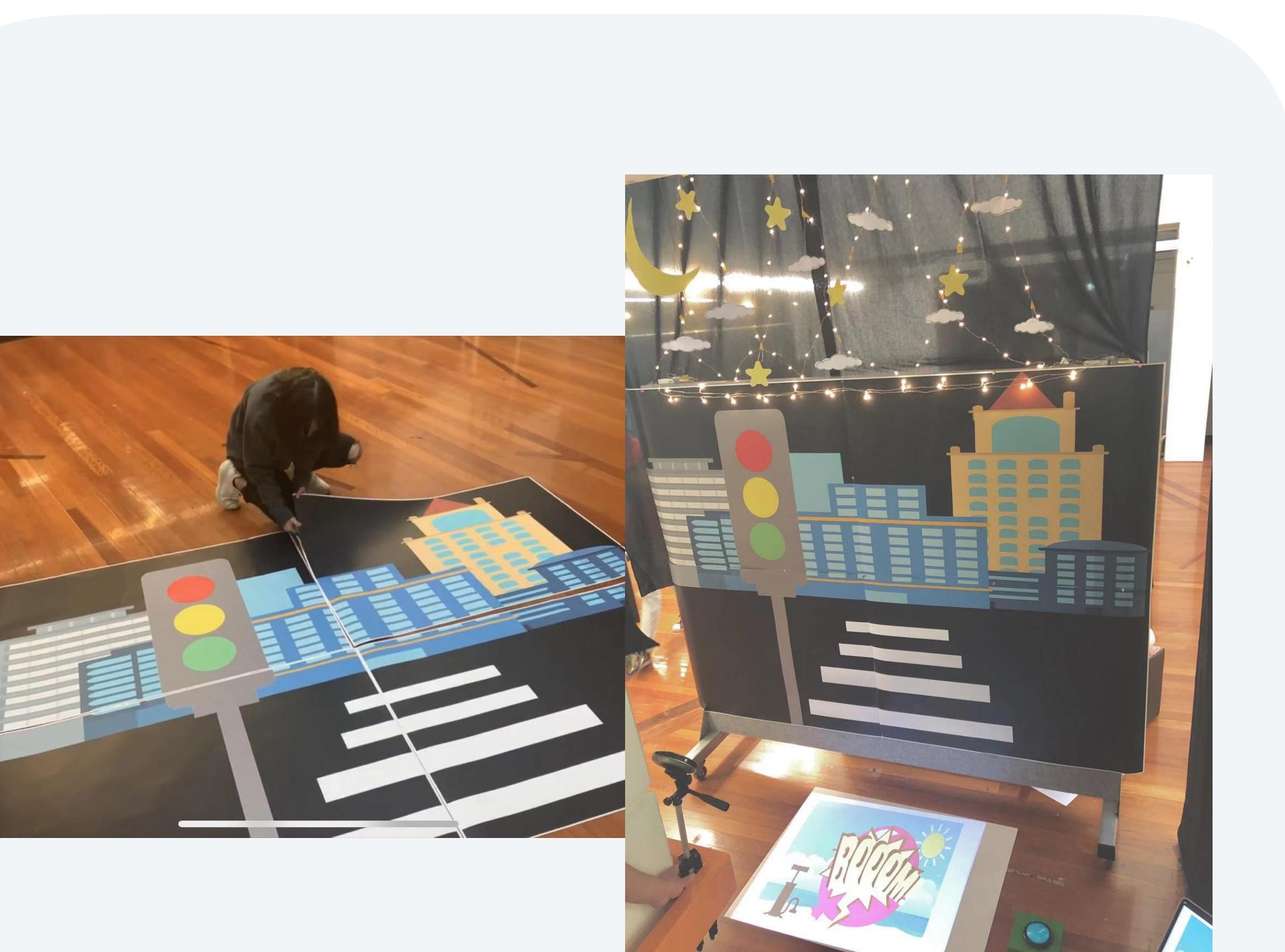
### Overview of design process

Press the button to pump up the balloon



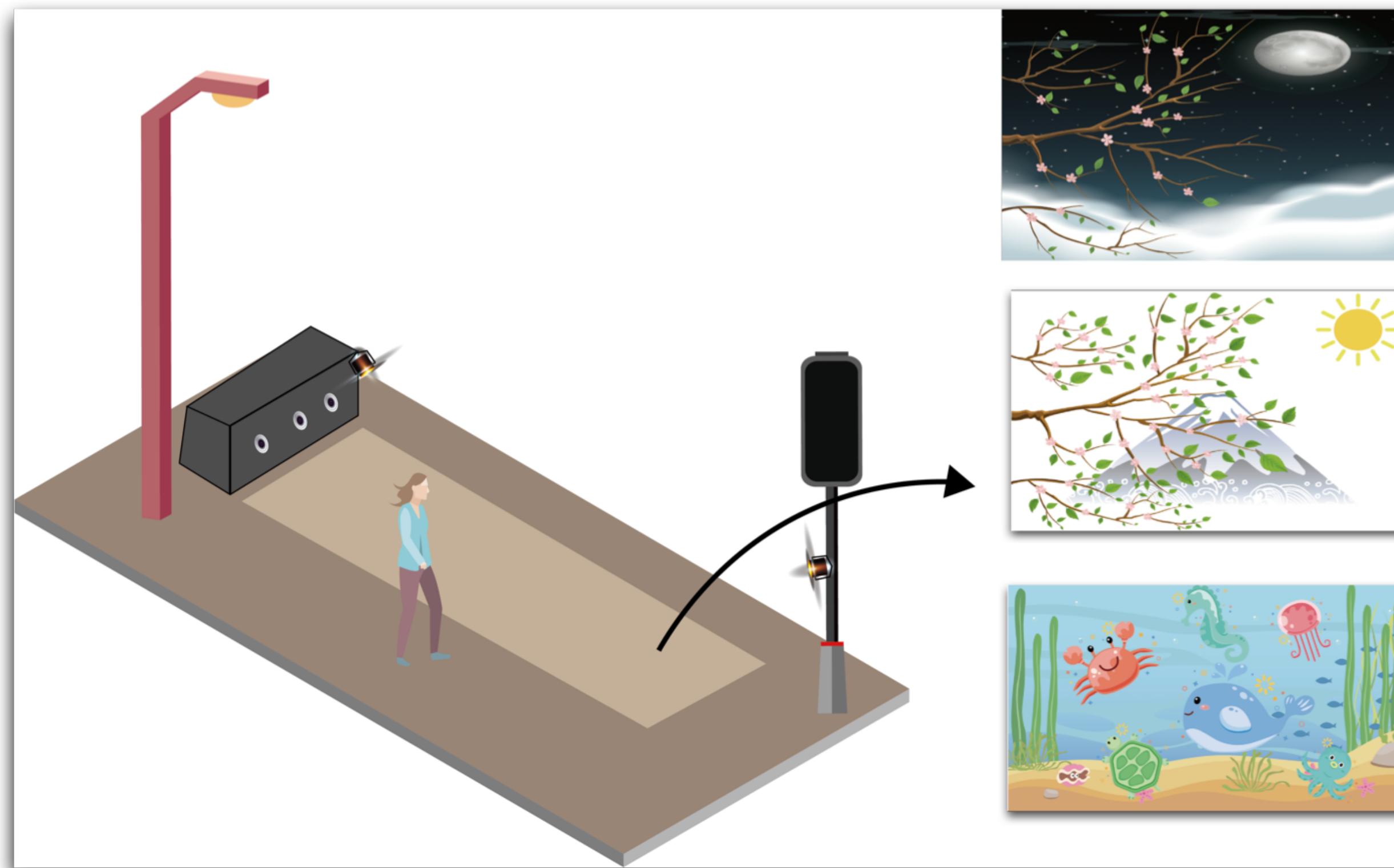
As the psychologist and professor of California State University Larry Rosen suggests that "People like to push all kinds of buttons as we hope that it brings a squirt dopamine for pleasure, or at least it reduces the cortisol that makes humans feel anxious — until we see what pressing it means." (Bryan Lufkin Why We Always Want To Push The Big Red Button We want to press buttons as we believe pressing it can help us to achieve or gain something.

Our final design concept is press the button to pump up the balloon, it's a very simple game and clear game instruction just press the button. User has clear expectation as they expect that when the balloon expands to a certain degree, it will explode. The game builds expectations through common sense and what they see in everyday life and press buttons that people can't refuse. This simple game not only reduces pedestrian's boredom but also encourages them to wait for traffic lights, also helping pedestrians release stress.



# Challenges

The main problems and challenges in our team in this semester are choosing final concept and building our prototype.

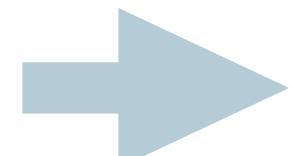
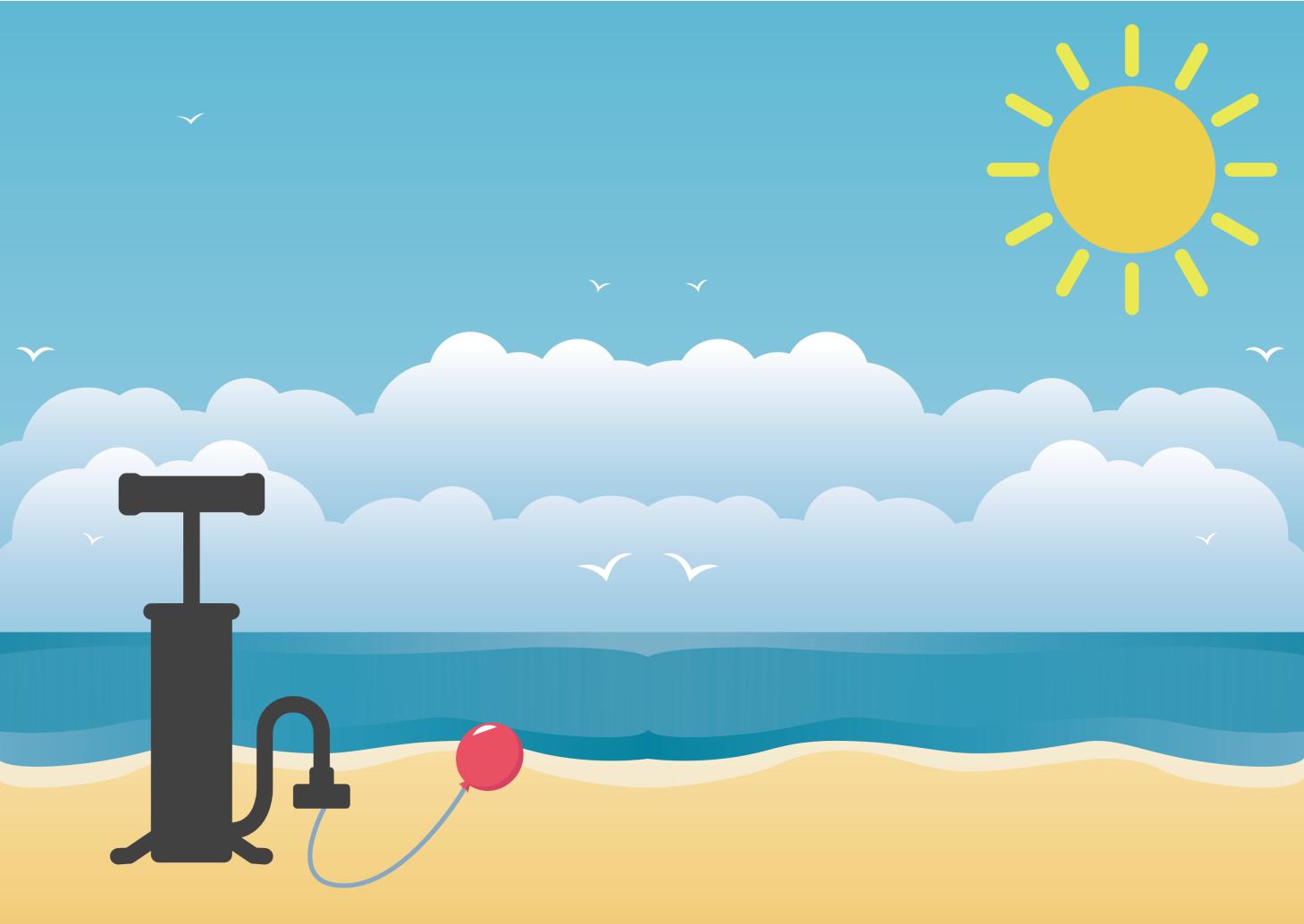


In assessment 1, we've come up with three design concepts. We've developed and improved our concepts in assessment 2 through three rounds of testing by using research methods such as interview and focus group to help us choose final concept. Even though we did lots of user testing and improvement on our final concept "blooming flower projection" in assessment 2, the concept still imperfect. After receiving tutor's feedback we realised our design concept has lack of expectation, the flower just keeps blooming after motion sensor detected pedestrian has a foot lift. The design has unclear ending, user don't know what is ending and what will happen in the end. This will reduce the attractiveness of the game and bad user experience.

# Challenges

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Press button to pump up the balloon



Ballon will explode after pump 30 times



We've come up the our final design concept mainly focus on press button to complete the game. As the psychologist and professor of California State University Larry Rosen suggest that "People like to push all kinds of button as we hope that it brings a squirt dopamine for pleasure, or at least it reduces the cortisol that makes human feel anxious – until we see what pressing it means" (Bryan Lufkin Why We Always Want To Push The Big Red Button).

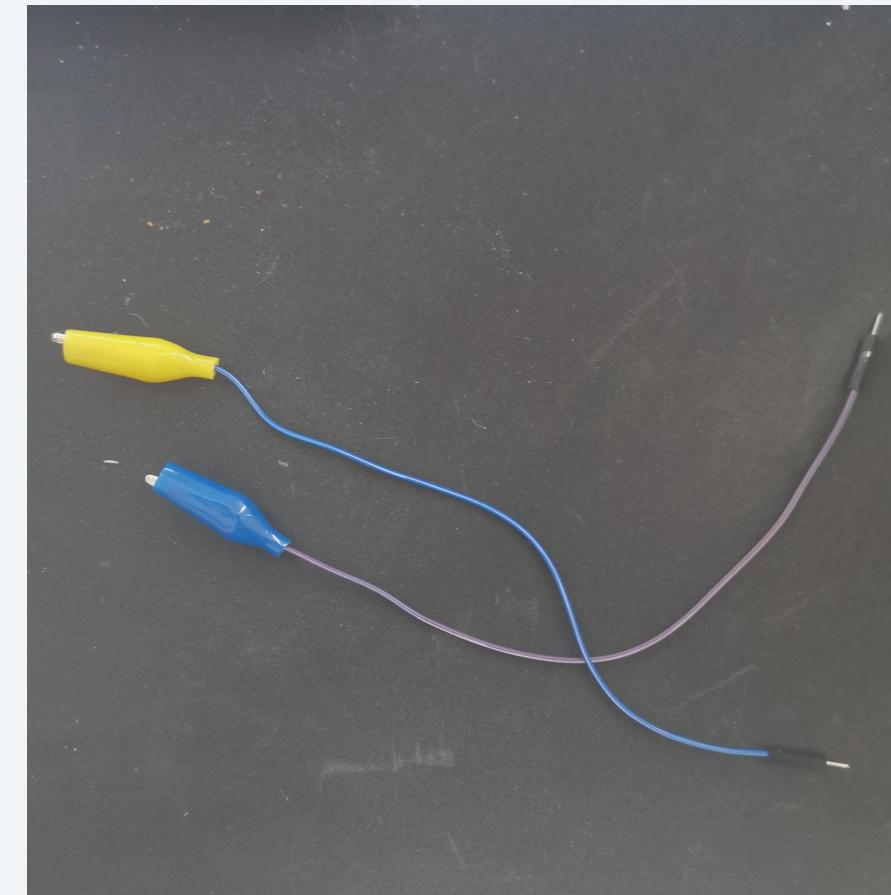
# Challenges

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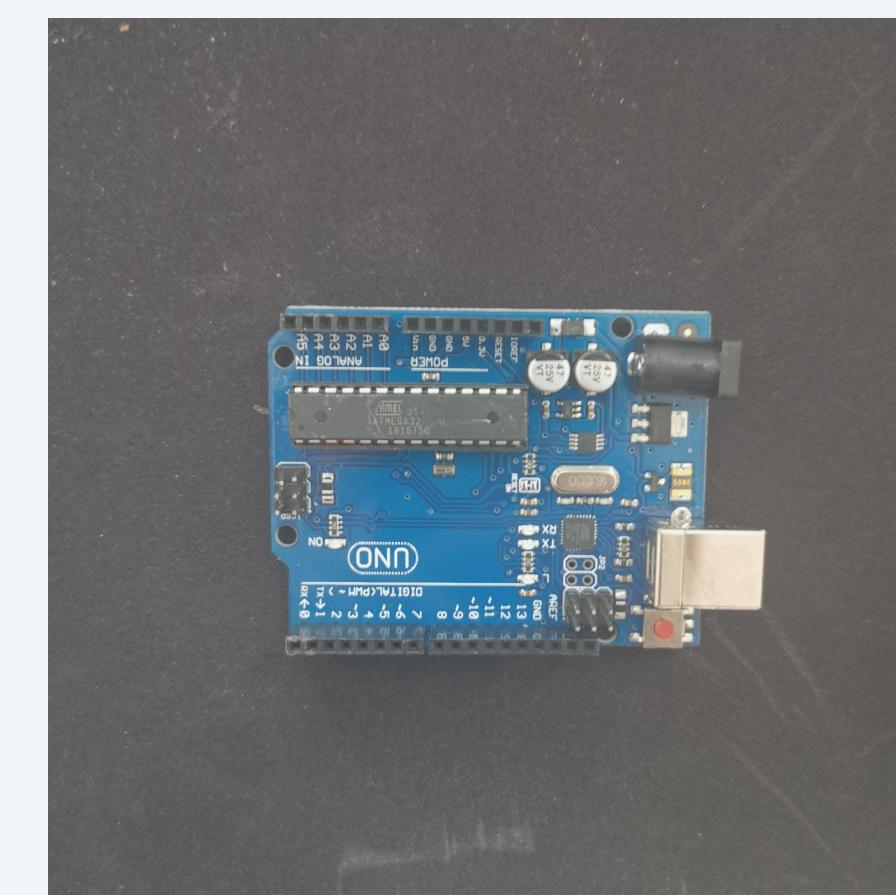
The second challenge we faced is we don't have enough time to build our high fidelity prototype. All of our group members don't have good skills on coding, we all have to spend huge amount of time on learning coding. This results we were facing technique limitations, we have to ensure we able to code our prototype in short period of time.



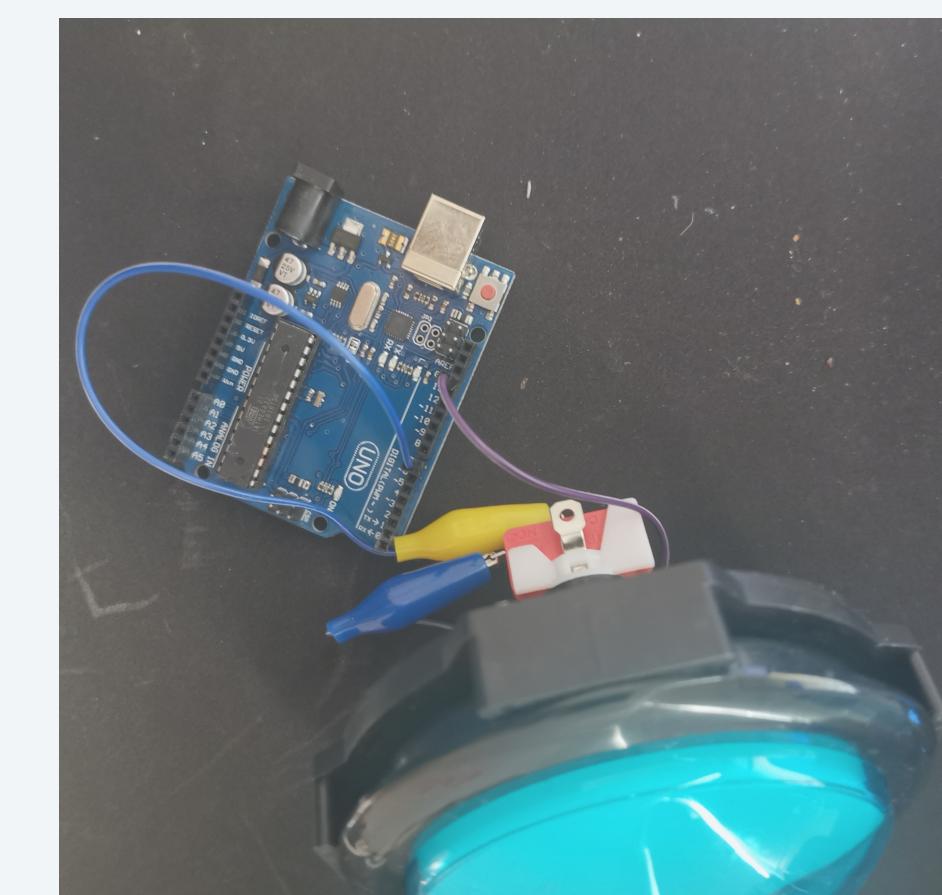
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We don't have much time to code, we choose to use Arduino board as we learned before is easily for us to get start. We used Abode Illustrator to create game screen and use Arduino uno r3 to code.

# Final Reflection

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How well did you work in your team?



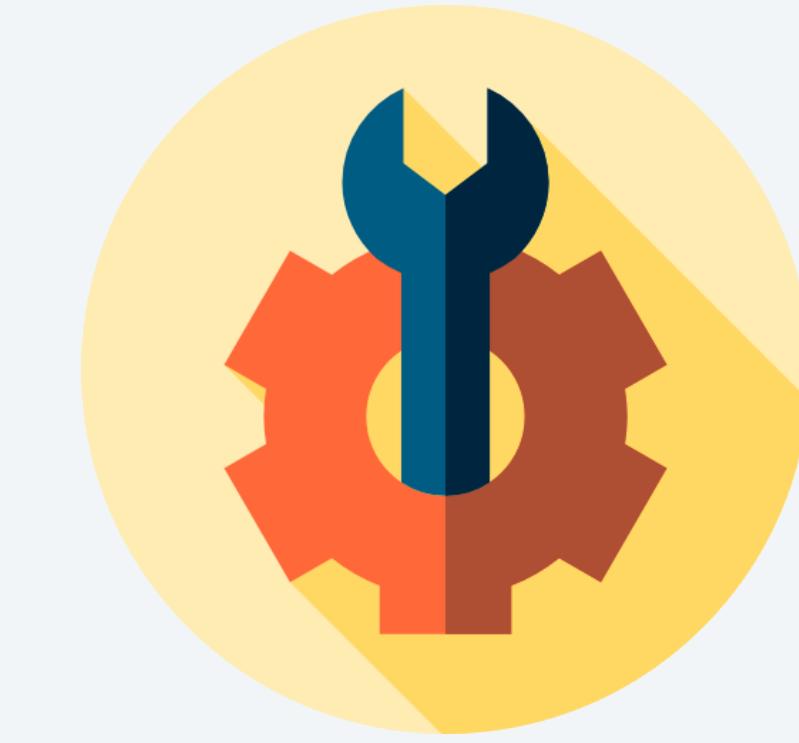
In our team, we all participated well. Every assessment task, we worked together and equally divided work to each group member. We arranged our group meeting mostly at school and everyone came on time and no one leaves early. We also has a WeChat group allow us sharing ideas and discuss issues.

What could you have done differently?



For next time, I may done differently in time management. The main issue in our group is we didn't equally spread the time, which lead we don't have enough time work on our prototype.

Will your team continue to work on the prototype further?



Due to the limitation of time period and our skills, our prototype is imperfect, we will continue work on the prototype further by adding function such as ranking system and connect the game with the traffic light.

# Reference

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- Lufkin, B. (2015). Why We Always Want to Push the Big Red Button. [online] Gizmodo. Available at: [https://www.google.com.au/amp/s/gizmodo.com/why-we-always-want-to-push-the-big-red-button-1723914709/amp](https://www.google.com.au/amp/s/gizmodo.com/why-we-always-want-to-push-the-big-red-button-1723914709/) [Accessed 8 Nov. 2019].**
- Ding, T., Wang, S., Xi, J., Zheng, L. and Wang, Q. (2014). Psychology-Based Research on Unsafe Behavior by Pedestrians When Crossing the Street - Tongqiang Ding, Shengli Wang, Jianfeng Xi, Lili Zheng, Quan Wang, 2015. [online] SAGE Journals. Available at: <https://journals.sagepub.com/doi/full/10.1155/2014/203867> [Accessed 25 Aug. 2019].**