Anti-programming Programming Club

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Project Brief

Problem

According to our research, pedestrians are always playing their mobile phones after pushing the countdown button. Some of them cannot immediately notice the traffic lights are changed.

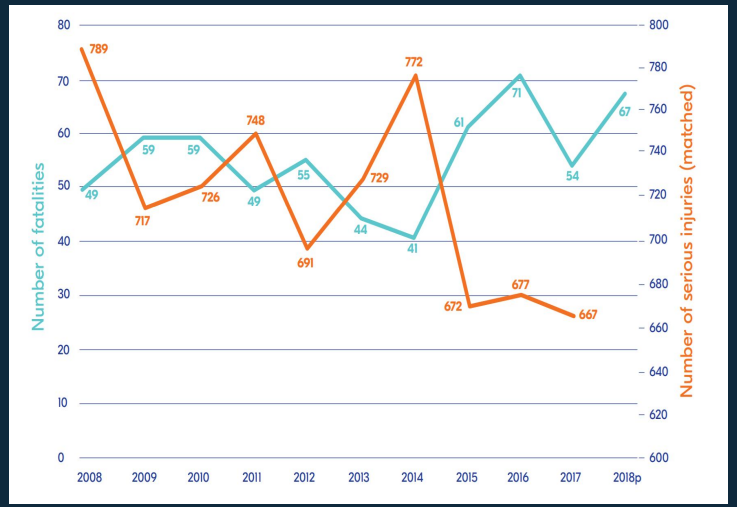
Moreover, some pedestrians are still playing their phones while crossing the road.

Therefore, we aim to replace the behaviour of playing phones when they are waiting for the traffic light.

How to link to stream's brief

- To improve pedestrians' waiting experience.
- To avoid potential safety issues regarding playing phone while crossing the road.
- To make the way of pushing button more interactive.

Background Research



1. Pedestrian fatalities and matched serious injuries from 2008 to 2018 (as at 1 January 2019)
Source: Centre for Road Safety

Why do we choose pedestrians?

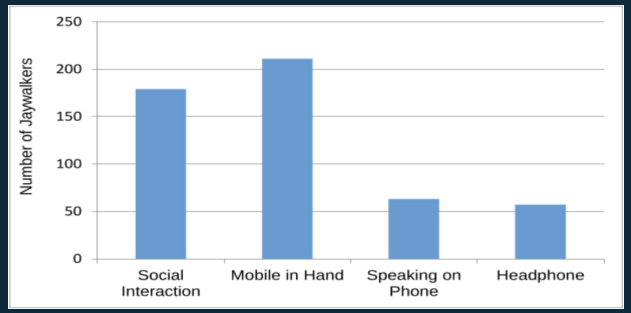
According to the survey, “The City of Sydney's pedestrian counts show that more than 100,000 people walk along George Street near Wynyard each day, and nearly 50,000 walk around Railway Square and along Park Street and Market Street," Cr Moore said in the letter. (Two minutes too long before crossing?, 2018)

Pedestrian trauma accounts for 17% of all deaths on NSW roads and 9% of serious injuries. More than 1,900 pedestrians are killed or hospitalised from road traffic crashes each year. And in 2018, 67 pedestrians lost their lives. (Keeping Pedestrians Safe, 2019)

Pedestrians usually play their phones when they are waiting for the traffic light

In the existing surveys, we found people are more likely to play with their phones when waiting for the traffic light.

Phone zombie has become a frequent topic of discussion. Pedestrians can only relieve boredom by playing with their phones to break the monotony of waiting for traffic lights.



2. Contributing factors observed at the crossing 1
Source: Exploring Jaywalking at Intersections(2017).

Consequence

According to existing research, the author had the observational study of 26,390 pedestrians across three intersections in the Sydney CBD.

36% pedestrians crossed the road while distracted by their smartphones or wearing earphones. (Keeping Pedestrians Safe, 2019)

From the observation of Hyman et al. in 2010, individuals walking while talking on a cell phone displayed inattentional blindness. Consequently, about 75% of the cell phone users failed to notice unusual activity compared to over half of the people in the other testing conditions who reported noticing unusual activity. In the investigation of Schwebel, participants distracted by musicor texting were more likely to be hit by a vehicle in the virtua pedestrian environment than the undistracted participants, and no behavioral differences were observed between male and female participants. (Distracted walking, 2015)

Observation

Type of Infrastructure:

Traffic Lights

on -site location

City Road

Number of participants

30

What did people do at this infrastructure?

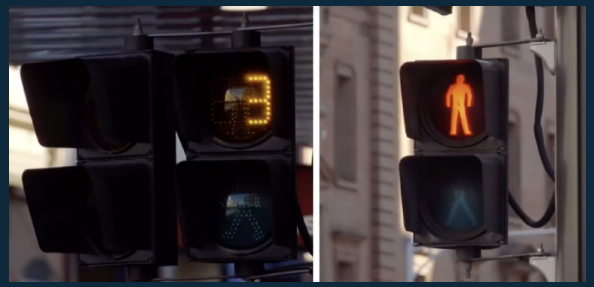
We observed the behaviours of pedestrian while waiting for traffic lights. Eighteen of pedestrians walked alone, and 12 of them focused on their phones. The remaining 12 people walked in teams and talked with each other.

Market analysis

1. Pedestrian countdown timers
Using a countdown to remind people of the remaining time for the green light.

Advantage: Pre-judgment , Visual reminder

Disadvantage: Unattractive , Lack of audio reminders



2. Traffic lights on the ground
The traffic lights are built on the ground to help people who are playing with their mobile phones to notice the changes.

Advantage: Design for phone zombie

Disadvantage: Excessive brightness, Lack of audio reminders

Market analysis

3. StreetPong

StreetPong is a game which installed on traffic lights for pedestrians to pass time while waiting to cross the street.

Advantage: Interest, Attractive

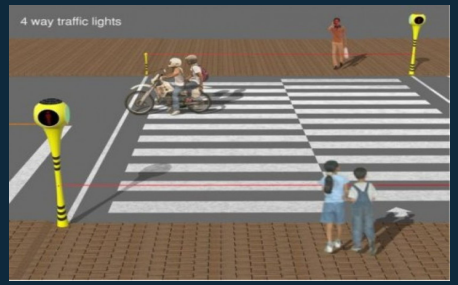
Disadvantage: Limit number, Lack of audio reminders

4. Traffic separated using lasers

The system utilizes thin laser beams that 'block' the way.

Advantage: Visual Reminder, obvious

Disadvantage: Vapidity, lack of audio reminders



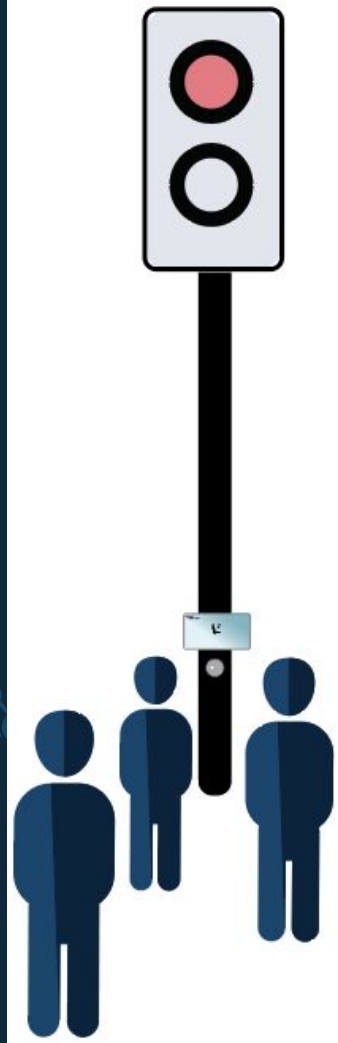
Concepts

Sound Simulator

- The design response to pedestrians' normal action while they wait for the red light, plays a different kind of weird sounds regarding the situation with a speaker on the top of pillar and screen above the crossing button.

  E.g. If pedestrian press the button on the pillar quickly and continuously, the speaker will play the sound of breaking glass and show an image of broken glass on the screen, reminding people if no one had pressed the button, or the traffic lights are about to turn green.

- It is designed to attract pedestrians' attention and give them more control over the timing while them waiting for the traffic lights.



Compare to existing product

Traffic lights on the ground

Benefits:

- The design of sound simulator works better in an emptier space, the sound came out is more audible and impressive for pedestrians.

Limits:

- the design of sound simulator lack simplification and flexibility as the screen on the pillar responsible for part of the function, such as display image.

Pedestrian countdown timers

Benefits:

- The design of sound reminding pedestrian also works while their distracted or looking down.

Limits:

- The sound would be blocked if pedestrian wearing a headphone or place is too noisy.

Talking Crayon Shin-chan

- A model of Crayon Shin-chan which has sound feedback when pedestrians touch it
- The physical model will be placed below the push button of the traffic light
- Once the push button being pressed, the Crayon Shin-chan will say “Touch me please” repeatedly until someone touches it or the traffic light turns
- The model tells how many seconds left to wait when being touched
- When the traffic light turns, the model will speak to remind pedestrians to cross the street

Compare to existing product

- Compare to existing product like countdown timers, the talking model has audio feature to catch pedestrian's attention
- The cartoon appearance could attract pedestrian's attention at first glance.
- Audio alert is more efficient to remind pedestrians the traffic lights have changed than visual numbers while they are playing on their cell phone
- Compare to "streetpong", it has no limit of number of pedestrian
- But less interaction than "streepong"
- Intense light would affect the usability of "streetpong"

Benefits:

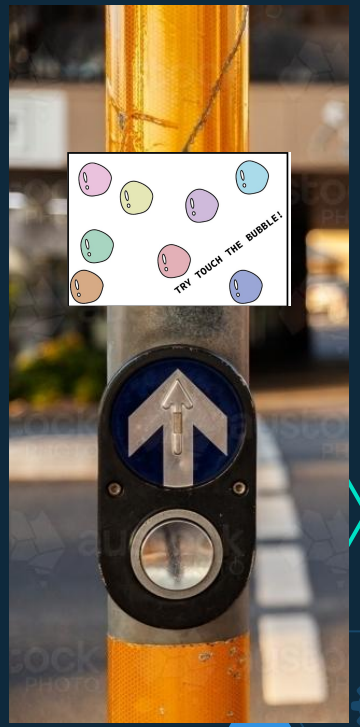
- Attractive appearance
- Audio feature of alert
- No limit of number of pedestrian

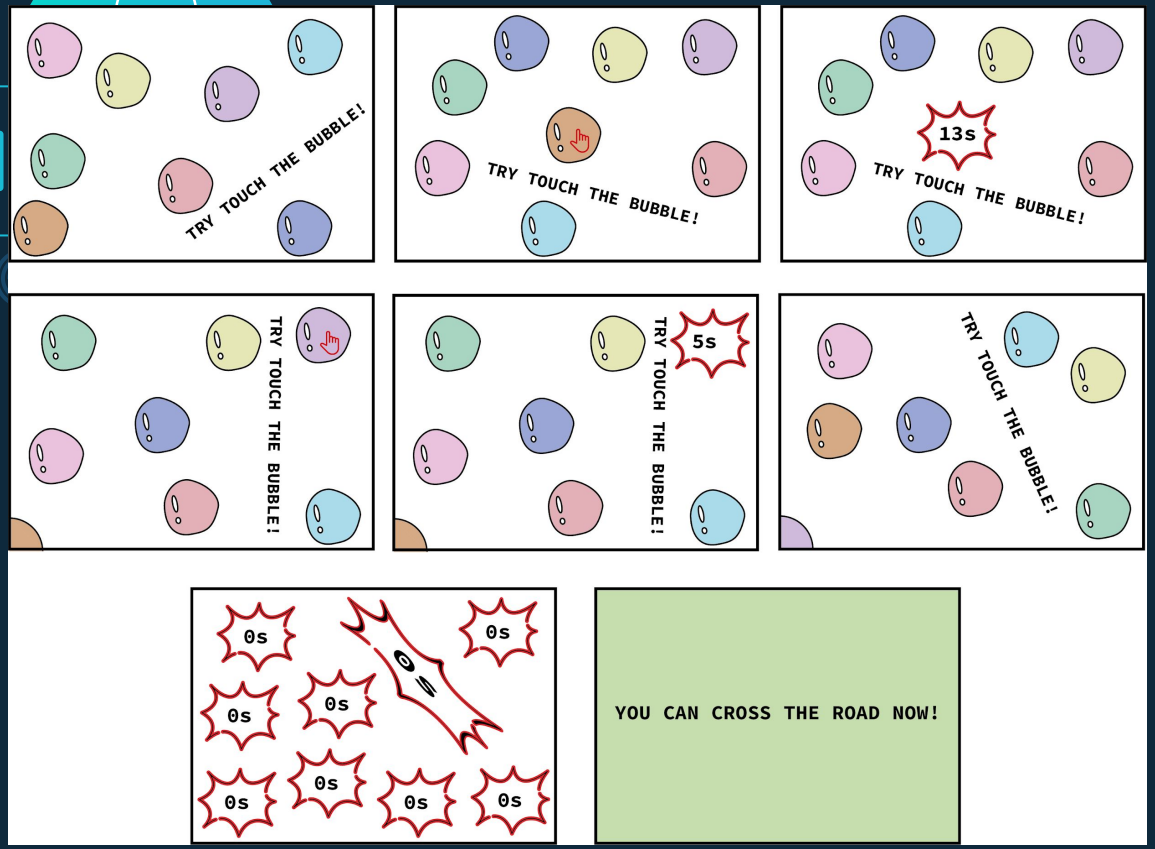
Limits:

- Lack of interaction

Counting Bubble

- The screen will be located above the counting button on traffic lights.
- After pushing the counting button, the system will be activated.
- There are many moving bubbles and a sign 'Try Touch the Bubble' on the screen.
- The bubbles will be broken as soon as being touched, and the broken bubble will show the countdown seconds of green lights from the broken moment and disappear in 1-2 seconds.
- If the existing bubbles are less than eight, the system will add new bubbles to the screen.
- When the countdown number reach to zero, all the bubbles will be broken together, and each broken bubble will show a sign of "0 second".
- After one second, the screen will change to green and appear a sign 'you can cross the road now!' until traffic lights change to red.





- ***Why moving bubbles?***
  Because moving stuff can attract pedestrian's attention immediately.

- ***Why moving signs?***
  For telling pedestrians the method for playing the game and encouraging them come to join in.

Compare to existing products

- Compare to the ***pedestrian countdown timers*****,** the counting bubble transfers the timer to bubbles. The only way for pedestrians to know how many seconds left is attending the bubble games, which is more interactive.

- Compare to the ***traffic lights on the ground*** and ***traffic separated using lasers***, the working time of counting bubble is longer than the existing products. Because lights can only be seen at night, so it cannot not work at daytime. But touch screen can work in whole day which is more useful.

- Compare to the ***streetpong***, the counting bubble can still be run even if there is nobody on the other side of road.

Benefits:

- **Transfer** the timer to bubbles.
- **Motivate** the pedestrians attend the bubble games.
- **Attract** pedestrians' attention immediately by moving objects.

Limits:

- Touch screen does not work at **daytime**.

Hardware requirements

Sound Simulator

- Flat Panel Display
- Waterproof outer
- Speaker
- Sensor

Talking Crayon Shin-chan

- Arduino board
- Mini speaker
- Shell by 3D printing
- Touch sensor

Counting Bubble

- Flat Panel Display with touch screen
- Countdown system
- Speaker
- Waterproof outer

Software requirements

- Openprocessing / AE
- Atom / GitHub / Visual Studio
- C++

- 3Ds Max
- Arduino
- C++

- Processing
- Arduino
- C++

Group Charter

Programmer: Yangsong Ou

Graphic Designer: Sen Deng

Text Editor: Jingzhu Lin

Physical Tools and Materials Manager: Liangyi Wang

We will do other works like prototyping and user evaluation together. Moreover, we have also shared opinions for better development of all works above.

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