DECO3200 Portfolio

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Final Prototype

The climber gives the pedestrian a different and innovative experience in the traffic light.
The climber is a physical game controlled by a button, there is also an iPad screen shows the process of the game.
During the red light, the pedestrian is able to play this game by pressing the button. Every five times the button is pressed, the koala will be lifted up one step. When the koala reaches the top in a specific time, it means the pedestrian wins the game. Meanwhile, the iPad screen will show a celebratory page.
If the koala does not reach the top at a specific time, it means the pedestrian loses the game. At the same time, the iPad screen will show a failure page.
Regardless of pedestrian wins or lose the game, the koala will go back to the starting point automatically.
When the light turns green, the iPad screen will change to a "Please crossing the street" page, and the game cannot be played until the next red light.

We aims to improve the experience of the current pedestrian traffic light in Sydney.

pedestrians now spend roughly 20% of their time waiting at intersections. (David. L., 2018) Waiting for the traffic light may be bored, based on our research, we found that most of pedestrians tend to do things that will distract them while waiting for the traffic lights, such as playing mobile phone. It may lead pedestrian to cross the street in the wrong time. On the other hand, in Psychology, boredom makes time goes slowly. (Valtteri. A., 2012) It may cause in more illegal crossing because pedestrians are forced to wait more than a minute to cross the road, (Ben G & Victoria C, 2018) it is dangerous.

Team Structure

Task	Contributors
Background research	All members
Building the low & high-fidelity prototype of the previous concepts	All members
User testing	All members
Purchasing	All members
Building the model in Dmaf	All members
Arduino and processing Coding	Siying Ma, Jiayu Ye
Designing the screen interface of the final prototype	Mengyu Li, Yiqi Liu
Filming the video	Siying Ma
Editing the video	Siying Ma
Report	Jiayu Ye, Yiqil Liu, Mengyu Li
Visual design	Siying Ma

Team Structure

I am one of the members of our group who is responsible for the context of the report, including analyzing, describing and modifying.

In assessment 1, I was responsible for the background research, including interviews, questionnaire and secondary research. More than that, I was also responsible for the second concept called Fist Bump, including the description of the concept and low-fidelity prototype.

In assessment 2, I was responsible for making the high-fidelity prototype of the Fist Bump and the shape of the button. I also contributed 10 users testing each round.

In assessment 3, I was responsible for the physical model building (including the pillar, boxes, and coloring) and Arduino and Processing coding.

Contributions

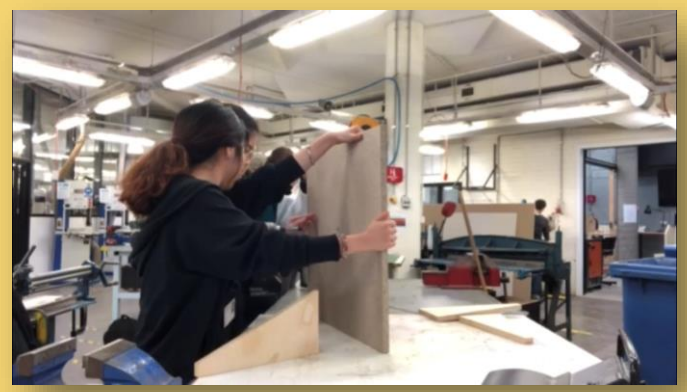
In assessment 1, for secondary research, I searched relative articles and news online. For personal research, I discussed with my group members about the questions of the questionnaire and I wrote them down. I also interviewed 2 people about the experience of the traffic light. After that, I analyzed the results of the background research and making a low-fidelity prototype for one of our initial concept, Fist Bump.

In assessment 2, I was responsible for making the high-fidelity prototype of Fist Bump, and I did 10 user testing for our initial three concepts. After user testing, we discussed based on the result of the user testing, we decided to get rid of the Fits Bump concept, but still, maintain the idea of different button shapes. In this way, I was responsible for making the different shapes of the button for our second-round high-fidelity prototype and I did 10 user testing again. After the second round of user testing, we determined our final concept called the CNL button according to the result of the user testing. I was still responsible for making the different shapes of the button for the high-fidelity prototype of our final concept and I did 10 user testing again.

Based on the user testing we did, I was responsible for analyzing the result and writing them down in our report.




Contributions



In our assessment 3, we started to build our final prototype. I was responsible for the physical modeling and coding in this assessment.
We built our physical model in Dmaf. We have two pillars for our final prototype, one is a traffic light pillar and another one is a button pillar.

For the traffic light pillar. At first, we built the pillar because it is the support of everything. We screwed the 2.2m long cuboid to the base and screwed four trapezoids on the side to make sure the pillar is stable. After building the pillar, we started to put our traffic light and countdown machine on the pillar.

For the button pillar, we built the pillar in the same way as the traffic light pillar. The next step was to build an iPad case and a box for putting Arduino and laptop. We scaled the size of our iPad and made a case according to its size. We made our box base on the size of the iPad case because the iPad case needs to cover the box. After built the case and the box, we decided to color the pillar, case, and box first because they become difficult to color after screwing on the pillar.

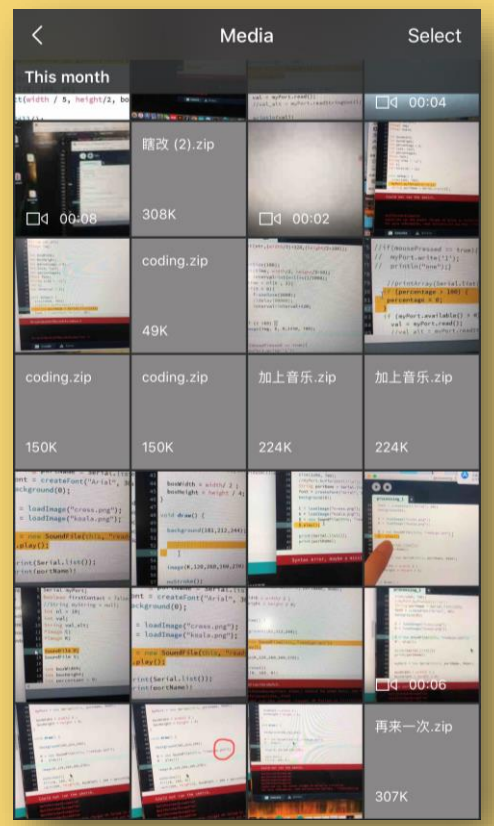
We colored the pillar and box in brown color, the base in green color, the case in silver color to increase the legibility and people are easier to recognize the iPad.
After coloring, we screwed them on the pillar. The next step is to create a pulley, we made a pulley with a deep groove for putting the string. After that, we colored the pulley in sliver color and screwed it on the top of the pillar. We also nailed a small cuboid in brown color on the top of the pillar to prevent our koala moving over the pulley. The last step is to put our button on the pillar. We make a button case in sliver color according to the size of our own button and screwed it under the iPad case. We also made a small box for our stepper motor and we stuck it in our Arduino box.

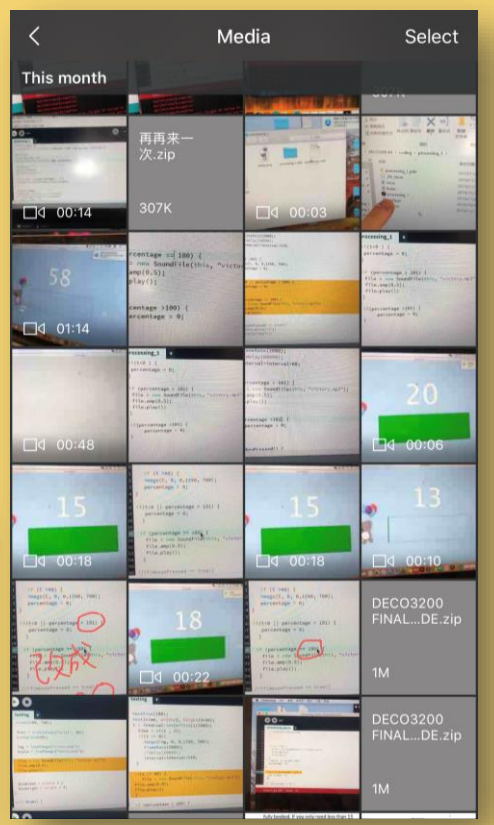
Contributions

I was also responsible for the coding in our final prototype.
Arduino coding is for running the entire model, while processing coding is for the interface.

For Arduino coding, the first step is to connect the wire of the button and stepper motor to the correct port in Arduino Uno and driver. As we did not know the positive and negative port so that we try and re-connect until the stepper motor turns well by using the stepper motor example in Arduino. After that, we started to find and write the correct code for the connection between the button and the stepper motor. We found some online tutorials and the Arduino library, and we tested it again and again. We also consulted with our tutor when we stuck by some problems. After connecting the button and the stepper motor, we wanted to make the stepper motor turning back the specific round, we continued to find the online tutorial, consulted with our tutor and we discussed about the coding until achieved what we want.

the processing coding, since I am more familiar with web coding. In this case, I tried to make Arduino run in processing, and then made our processing run in HTML. While I found Arduino cannot be run in HTML. Therefore, I got rid of HTML and learned how to make an interface in processing, so I made all of my interface in processing. Putting pictures and audio and set up "millis" to control the timer in processing.





Challenges

Actually the final prototype we confirmed at the end of our assessment two is CNL Button. There are three functions of that concept: the arrow will light up after someone pressed the button, the real-time news will be played on the screen and a figure countdown section.

However, while building the final concept, we did some user testing and some of our users claim that our concept has less interactive. By receiving this feedback, we started thinking of this problem and finally, we agree with this feedback. In this case, we discussed for improving our concept. We re-examined the results of our user testing and we came out with a remedy.

Our main inspiration is based on a sentence from one of our users: "will the koala pop up when I press the button?". Based on our user testing, the game is also a suggestion from some of our users. This sentence is a breakthrough for our improvement.
Another inspiration is a new doll catching machine in Central station, we found that maybe we can combine the idea of pop up with doll catching machine.
After research and testing, we found that making a doll catching machine is too difficult and unrealistic for us.
After a lot of testing and research, finally, we came up with our final version after making an improvement, making the koala climb the pillar by pressing the button.

Challenges

The second problem we encountered in our final prototype is the **connection** between the **real traffic light**, the **countdown machine**, and our **button**.

We want to make our prototype looks perfect and easy for our users to understand, in this way, we **bought** the **real traffic light** and **countdown machine** online. However, when we received these two things, we found that **both** of them **cannot be connected**.

Moreover, when we building our final prototype, we found that it is **too hard to connect the real things with our button** because the distance between them is too far to connect. This is our negligence, but we **do not want to get rid of** these things we bought.

Therefore, we came up with a solution which is to **switch on the power at the same time**. In this way, the time of countdown and traffic light will be the same, and our interface and stepper motor will also run at the same time. It makes everything is connected.

Challenges

The greatest challenge in the semester for us is coding.

We spent about two weeks working on the coding of our final prototype. The most difficult part is to make the stepper motor turn a specific round back. We searched for the online tutorial, Arduino library and consulting with our tutors, but still cannot make it done well. It was due soon, we did not have time to change to another concept. Therefore, we continued to find out the correct coding for our prototype. We tried a lot of ways and different codes around four to five days. Finally, it was worked.

The second difficult part is to connect the button with the stepper motor. The stepper motor cannot work with the button at first, regardless of how many times we press the button, the stepper motor run automatically and it did not respond to the button. We tried a lot of methods and finally, they look connected. However, it is unstable, so we consulted with the tutor and we found that the connection of the button and the Arduino Uno may have some problems. After solved this problem, it worked properly.

Reflection

How well did you work in your team?

At the end of this course, I cannot say how well I have done in our prototype, I can only say that I have tried my best and make all-out my effort for all of our assessment.

What could you have done differently?

Since we still have a lot of problems in our prototype, I think we have less consideration while making the prototype. In this way, we could comprehensively consider these problems when we were building our prototype. Thus, we could make our prototype less problem and more suitable for reality.

Will your team continue to work on the prototype further?

If we have a chance, we would like to continue to work on this prototype and make some improvements based on our user testing. Making our prototype more suitable for reality because our prototype has a lot of problems in real life. For example, the koala and iPad may be stolen by others, there is no instruction for the pedestrian to know the game and so on.

Bibliography

Arstila, V. (2012). Time Slows Down during Accidents. Frontiers In Psychology, 3. doi: 10.3389/fpsyg.2012.00196

Does the pedestrian button do anything?. (2019). Retrieved 8 November 2019, from https://www.news.com.au/lifestyle/real-life/have-you-been-wasting-your-time-by-pushing-the-pedestrian-button/news-story/b87735fb87ad862c7e6fee6206510edc

How Australia's traffic signals favour drivers and discourage walking | David Levinson for the Conversation. (2019). Retrieved 8 November 2019, from https://www.theguardian.com/cities/commentisfree/2018/jun/11/how-australias-traffic-signals-favour-drivers-and-discourage-walking

Pictures:

Pedestrian safety needs to catch up to technology and put people before cars. (2016). Retrieved 12 November 2019, from https://sydney.edu.au/news-opinion/news/2016/09/27/pedestrian-safety-needs-to-catch-up-to-technology-and-put-people.html

Rogers, C. (2017). The big debate: Is coding must-have skill for marketers?. Retrieved 12 November 2019, from https://www.marketingweek.com/the-big-debate-marketers-coding/

Sydney CBD 40km/h area expanded to improve safety | Tomorrow's Sydney. (2016). Retrieved 12 November 2019, from https://mysydneycbd.nsw.gov.au/news/sydney-cbd-even-more-pedestrian-friendly-40kmh-area-expanded-improve-safetyhttps://www.marketingweek.com/the-big-debate-marketers-coding/