

# **DECO3200**

# **PORTFOLIO**

**Siying Ma**

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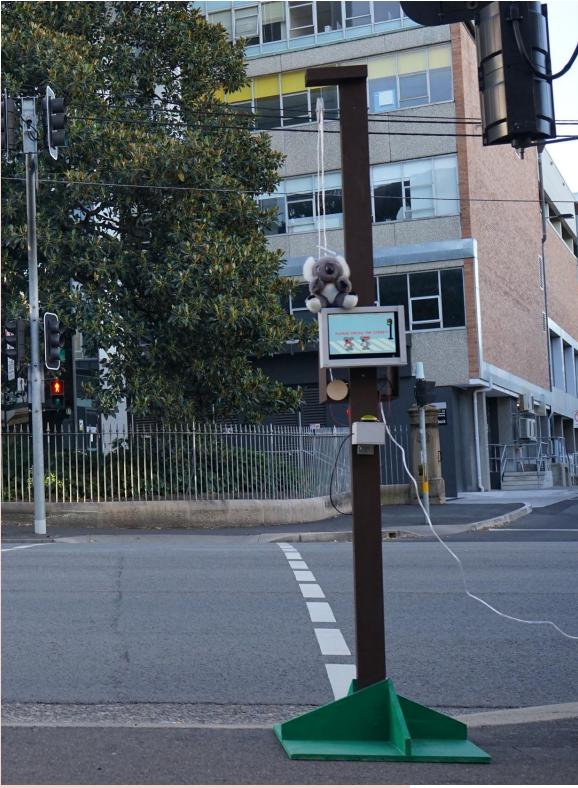
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# DESIGN BRIEF

Waiting for traffic lights is part of pedestrians' daily life (David.L, 2019). As indicated by related materials, pedestrians usually feel boring while waiting for the traffic lights. In Psychology, boredom makes people feel that time passes slowly (Valtteri.A, 2012). It possibly makes more pedestrians jaywalk it is dangerous.

According to observation, most pedestrians like fiddling with the phone while waiting for the traffic lights. However, pedestrians could be easily caused to jaywalk when they have absorbed themselves in phones. In Sydney, many people would cross the street after hearing the sound of traffic lights, and this is very dangerous. Therefore, we decide to design a new traffic light to improve pedestrians' experience in waiting. We focus on how to attract pedestrians' concentration and persuade pedestrians not to fiddle with their phones while waiting for the traffic lights.





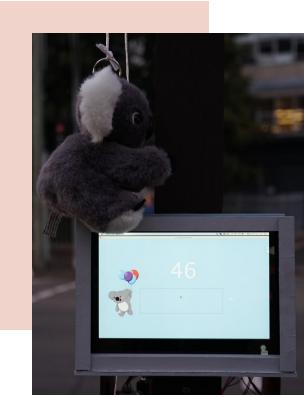
# INTRODUCTION

Our final concept was inspired by the central clip doll machine shop. We plan to develop a button which uses a traffic light to take control of entity toys. Our concept is named as Climber. This game aims to let users challenge whether the koala can reach the peak within 60 seconds. We selected the koala as our Climber because it is national treasure of Australia. The koala is hanging on the pillar by a rope. The game will be in operation only when the signal light turns to red. Therefore, this game will not let users miss crossing the road due to the over-concentration.

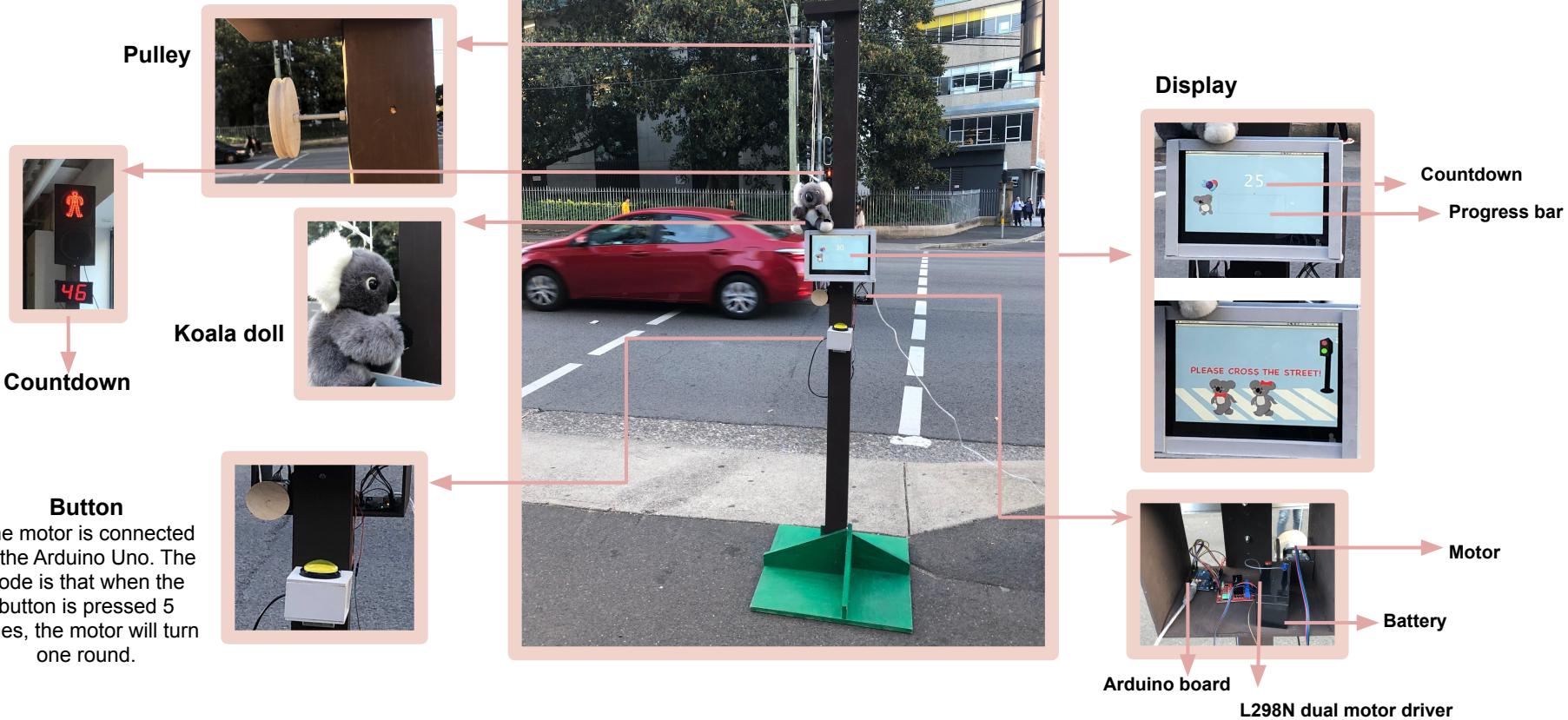
# PRODUCT DESCRIPTION



When the traffic road turns red, if someone presses the button for 5 times, step motor will rotate by a full turn and also life the koala. When the progress bar of the iPad's interface reaches 100%, it means that the user has become the winner. Besides, the interface will show "You Win". Then, the koala will climb to the peak and also pay the sound effect of Win. On the contrary, if the user fails to reach 100% within the required time, it means the game is failed. The interface will show " Game over, Please cross the street." and play the sound effect of " Game Over". When the red light is ended and the signal light turns to green, the koala will return to the starting point. The interface will show "pleases cross the street". The game will also be terminated.



# ILLUSTRATED SETUP INSTRUCTIONS



# OUR TEAM



Siying Ma



Jiayu Ye



Yiqi Liu

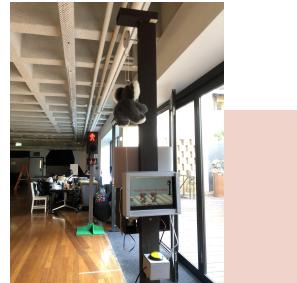
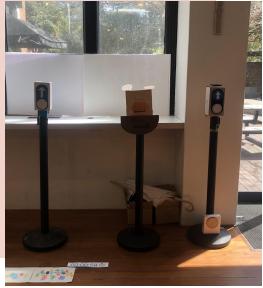


Mengyu Li

Our team members are Siying Ma, Jiayu Ye, Yiqi Liu, and Mengyu Li. My role in this team is like a team leader. It can be seen from the above table that I made the most contributions to this project since I participated in all the other tasks except the content of the final report. The next part describes in detail what each team member contributed to the overall project.

<b>Task:</b>	<b>Contributors:</b>
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	Siying Ma, Mengyu Li, Yiqi Liu
Filming the video	Siying Ma
Editing the video	Siying Ma
Report	Jiayu Ye, Yiqi Liu, Mengyu Li
Visual design	Siying Ma

# TEAM STRUCTURE



# MY KEY CONTRIBUTIONS

Background research was completed through the cooperation of the whole team. In the first user testing, we made three low-fidelity prototypes, among which Jiayu Ye and I respectively completed the prototypes of concept 1 and concept 2, and Yiqi Liu and Mengyu Li jointly accomplished the prototype of concept 3. There were two low-fidelity prototypes that needed to be carried out in the second round of user testing. After the discussion, we decided that two people would be responsible for one prototype of the concept. More specifically, Jiayu Ye and I were responsible for concept 1, and Yiqi Liu and Mengyu Li for the low-fidelity prototype of concept 2. In addition, Jiayu Ye and I completed the low-fidelity prototype of the final concept in user testing for the third time. There were 40 users for testing in each phase, who were required to complete 10 user testings. With regard to the high-fidelity prototype, the part of building the model required everyone to complete it in Dmaf, which had a very interesting process.

# MY CONTRIBUTIONS

As for purchasing, I was responsible for purchasing the traffic light model and all accessories used by Arduino. Jiayu Ye and I worked together to accomplish the coding part of Arduino & Processing, in which Jiayu Ye was mainly in charge of the coding part of Arduino while I was mainly responsible for the coding part of Processing and the visual design of the whole project, as well as the photography and editing of the video.



The screenshot shows the Arduino IDE interface with a sketch titled "Arduino\_6\_final\_music\_new". The code is written in C++ and includes imports for the Stepper library and processing.sound. It defines pins for a button and a stepper motor, initializes variables for button state, turn count, and debounce time, and sets the stepper's steps per revolution to 80. The setup() function initializes the serial port at 9600 bps and sets the stepper speed to 60 rpm.

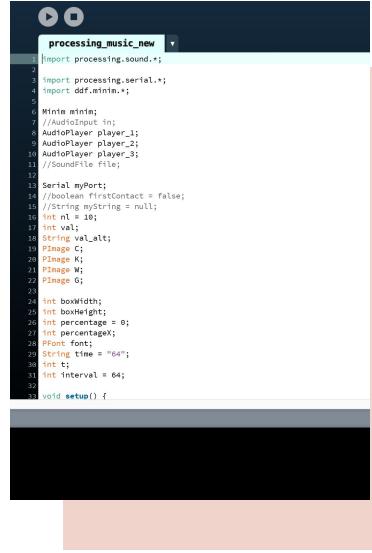
```
#include <Stepper.h>
const int buttonPin = 2;
//int buttonState = 0;
int stepCount = 0;
unsigned long maxTime= 57000;
unsigned long previousMillis = 0;
//unsigned long previousMillis = 0;
//const long interval = 5000;

const int stepsPerRevolution = 80; //change this for your motor

// initialize the stepper library on pins
Stepper myStepper(stepsPerRevolution, 8, 9, 10, 11);

int countSteps = 0;
int numTurn = 0;
//int NUMBER_TO_PRESS = 4;
boolean buttonState = HIGH;
boolean previousButtonState = LOW;
boolean turn = false;
long debounce = 200;
long time = 0;
char val_1;
```

```
void setup() {
  //printf("Hello!");
  Serial.begin(9600);
  pinMode(buttonPin, INPUT);
  // set the speed at 96 rpm;
  myStepper.setSpeed(60);
  //myStepper.step(stepsPerRevolution);
```



The screenshot shows the Processing IDE interface with a sketch titled "processing\_music\_new". The code imports processing.serial and ddf.minim libraries. It defines variables for audio input, players, sound file, and serial port. It also defines images C, K, M, and G, and initializes variables for box width, height, percentage, and interval. The setup() function initializes the serial port at 115200 bps.

```
import processing.serial.*;
import ddf.minim.*;

Miniaudio minis;
AudioInput in;
AudioPlayer player_1;
AudioPlayer player_2;
AudioPlayer player_3;
//Soundfile file;

Serial myPort;
//boolean firstContact = false;
//String myString = null;
//int n1 = 100;
int val;
String val_alt;
PImage C;
PImage K;
PImage M;
PImage G;

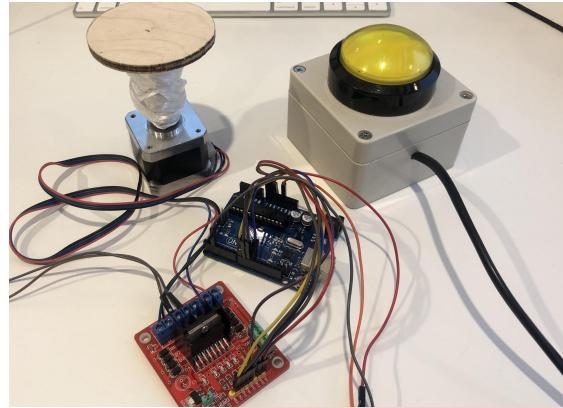
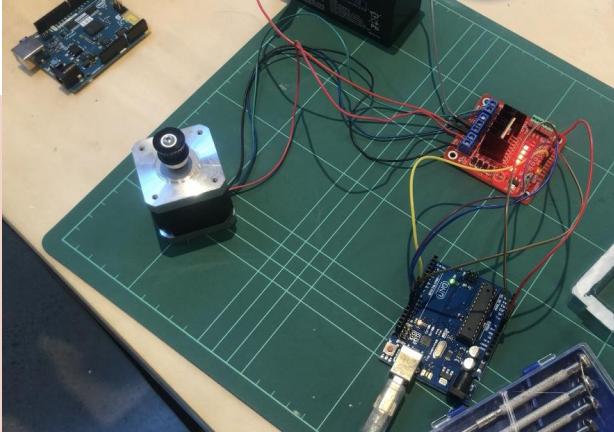
int boxWidth;
int boxHeight;
int percentage = 0;
int percentageX;
int percentageY;
String time = "%4d";
int t;
int interval = 64;
```

```
void setup() {
  myPort = new Serial(this, 115200);
```

# MY CONTRIBUTIONS

Assignment 1	Assignment 2	Assignment 3
Description_Concept 1	Iterations flow chart	Low-fidelity prototype
Storyboard_Concept 1	Low-fidelity prototype	High-fidelity prototype
Statement card	Statement card	Purchasing
10 User testing	10 User testing	10 User testing
Persona 1	Experience prototype	Arduino coding
Questionnaire Analysis	Timeline.	Processing coding
Visual design	Persona 1	Interface design
	Questionnaire Analysis	Editing the video
	Visual design	Filming the video
		Visual design

# CHALLENGES



In this semester, I think the biggest challenge is the coding part, furthermore is using stepper motor and push-button making a connection between with Arduino. When I tried to connect the stepper motor to Arduino, the biggest problem that I had encountered was how to run the step motor. We did not find anything wrong in the repeated examination on connection, but the motor didn't work. In the end, with the help of Jaycar staff, we found a cell that could be connected to the step motor driver. It gave sustained power supply to the driver so that the motor worked.

# CHALLENGES

At first, we had tried many means to power up the step motor. Because of our misoperation, we damaged an Arduino board. It was also a big challenge to connect the button to Arduino, as the push-button we bought had two lines. Once it was connected to the Arduino board, it couldn't work at all. Throughout online research, we found that we needed to add one more line to the push-button. In the part of coding, we also ran into many difficulties, but the biggest one was how to make step motor take a turn after pushing push-button for five times. In addition, we should figure out how to stop the step motor after taking enough turns. At the end of the countdown, the step motor would rotate to the starting point in the opposite direction. It was indeed a huge challenge for us.



# CHALLENGES

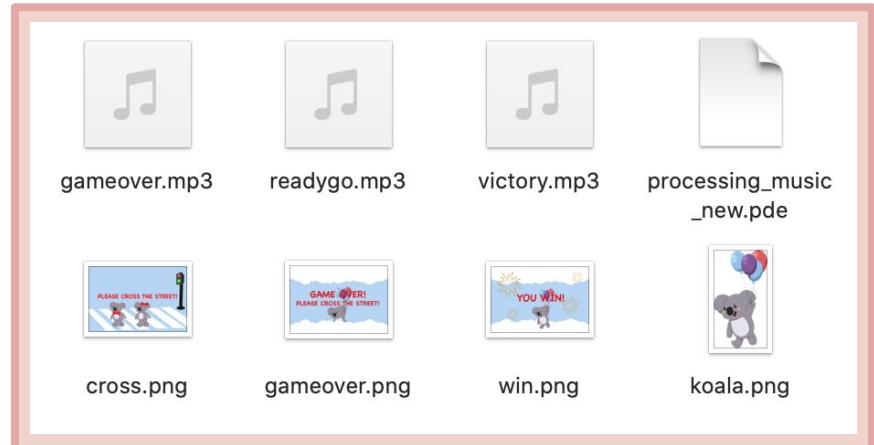
```
processing_music_new
import processing.sound.*;
import processing.serial.*;
import ddf.minim.*;

Minia minin;
AudioInput in;
AudioPlayer player_1;
AudioPlayer player_2;
AudioPlayer player_3;
Soundfile file;

Serial myPort;
boolean myPortSetContact = false;
String myString = null;
int nl = 10;
int val;
String val_1st;
String val_2nd;
String val_3rd;
PImage K;
PImage W;
PImage G;
PFont font;
String time = "64";
int t;
int interval = 64;

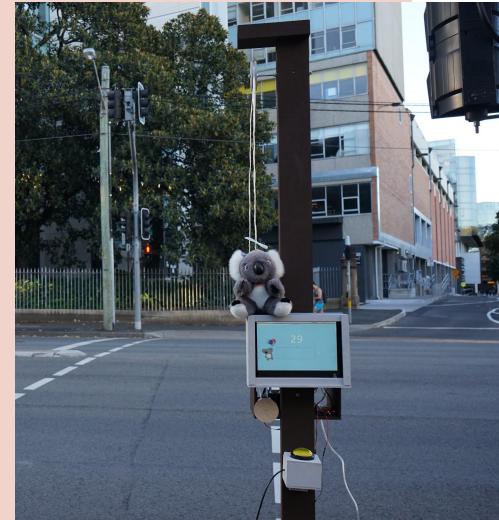
void setup() {
  ...
}
```

When we added sound effects, the sound did not play concurrently with the picture. Pictures appeared on time, but sound effects delayed. We were beset by the problem for a long time. When we had difficulties and bottleneck problems, we usually asked our tutor for help. Usually, we could solve all problems with the help of our tutor.



# FINAL REFLECTION

I thought that I played an active role in the team and made the most significant contributions. As members of our team not good at coding, Jiayu Ye and I proactively took the responsibility of this part. Since it was the last project in our uni, all of us wanted to challenge ourselves by making some new attempts. Personally, our teamwork was quite successful because all the members had finished the tasks on time. When we conducted a high-fidelity prototype, we decided to make a physical model temporarily. We did not have much time left and it really remained a huge challenge. However, we eventually completed the task within the given time, which made me feel excited. If permitted, we wish that we could have a chance to further study and improve the prototype in the future.



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

Levinson, D. (2019). *How Australia's traffic signals favour drivers and discourage walking | David Levinson for the Conversation*. [online] the Guardian. Available at: <https://www.theguardian.com/cities/commentisfree/2018/jun/11/how-australias-traffic-signals-favour-drivers-and-discourage-walking> [Accessed 12 Nov. 2019].

## BIBLIOGRAPHY

**THANKS  
FOR WATCHING**