DOCUMENTATION

TEAM ELEVATED

By: Megan Chen, Goh Jet Wei, Russell Teoh, Su Keming, Gan Xiao Tong

Creating team identity

#TEAM ELEVATED

3.007 Design Thinking and Innovation

Group 1

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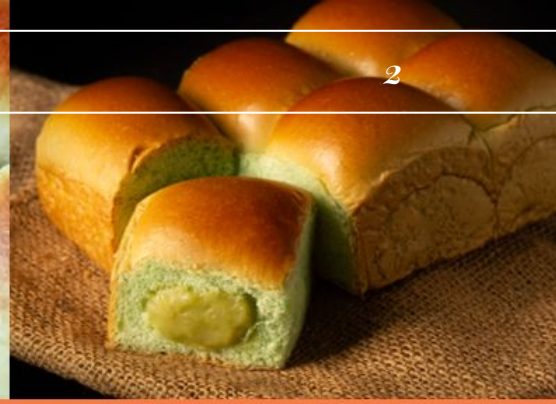
Gan Xiao Tong
Su Keming

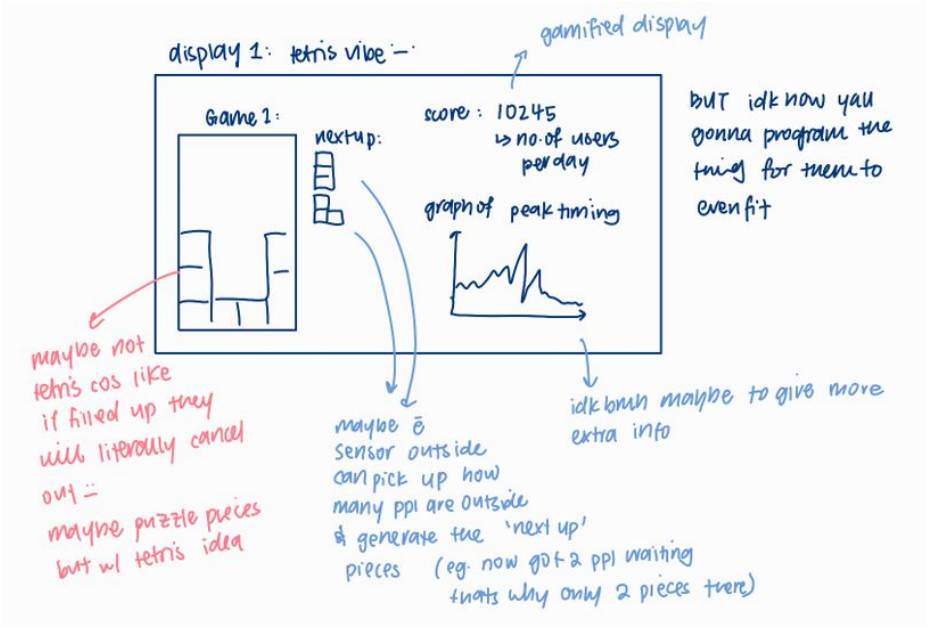
Russell Teoh
Goh Jet Wei

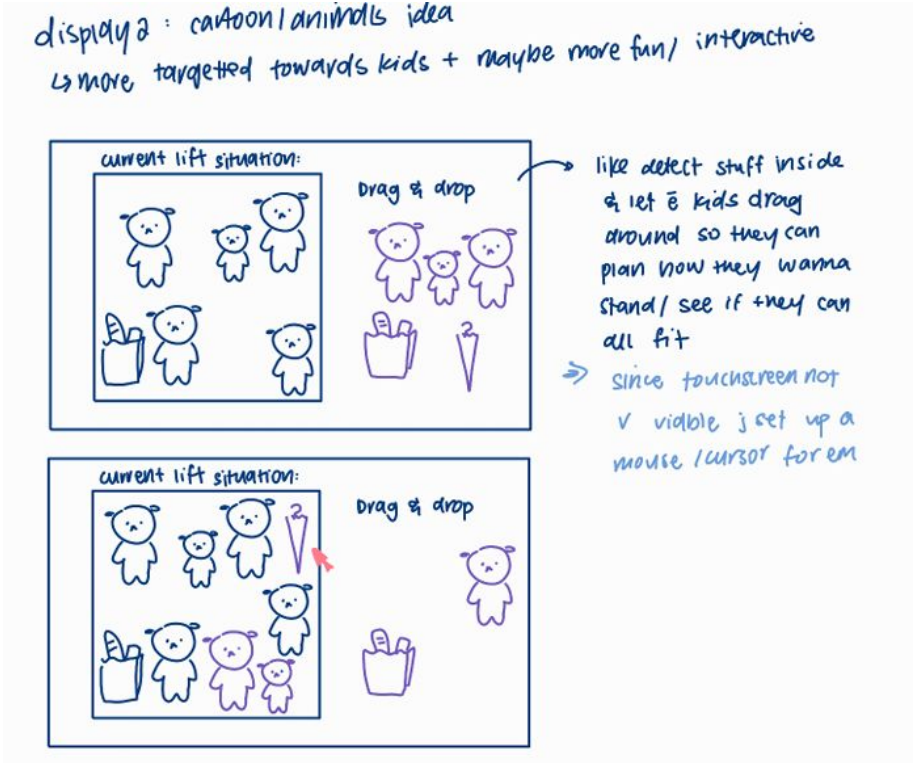


Our values:

- Just like how kaya spreads on the kaya bun, we believe in spreading our ideas and expertise.
- Just like how the dough rises when we bake kaya buns, we are driven by aspirations to elevate the quality of existing services.

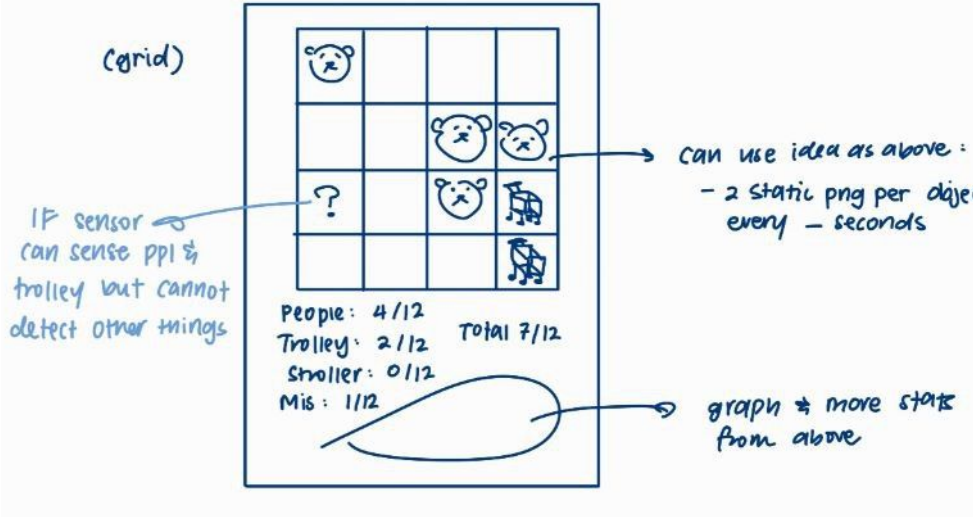
Exploration on different themes, layouts and basic testing to see whether the solution can be implemented.

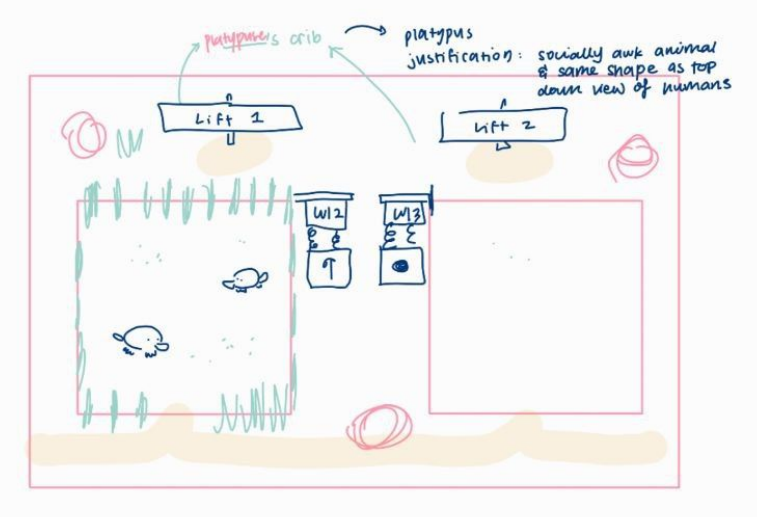




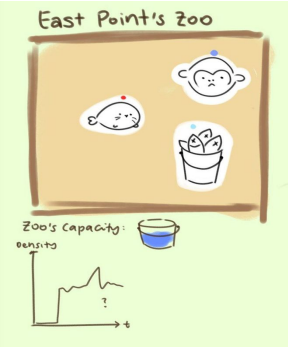
Design evolution

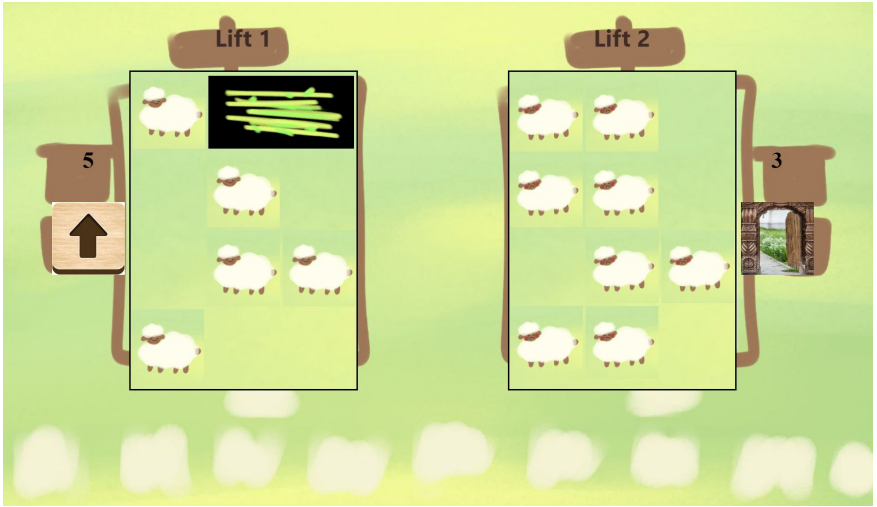
Exploration on different themes, layouts and basic testing to see whether the solution can be implemented.

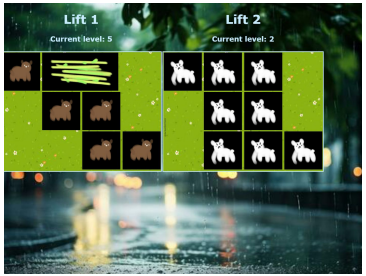




Design evolution

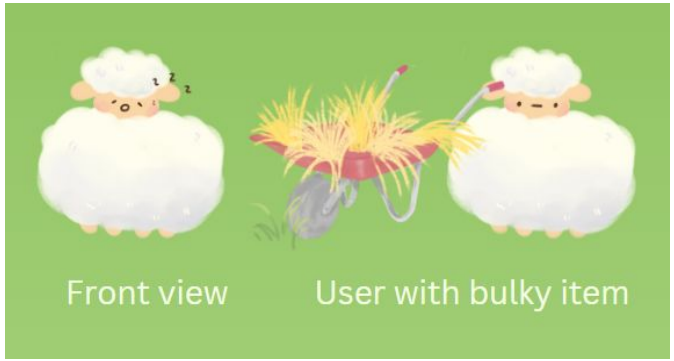




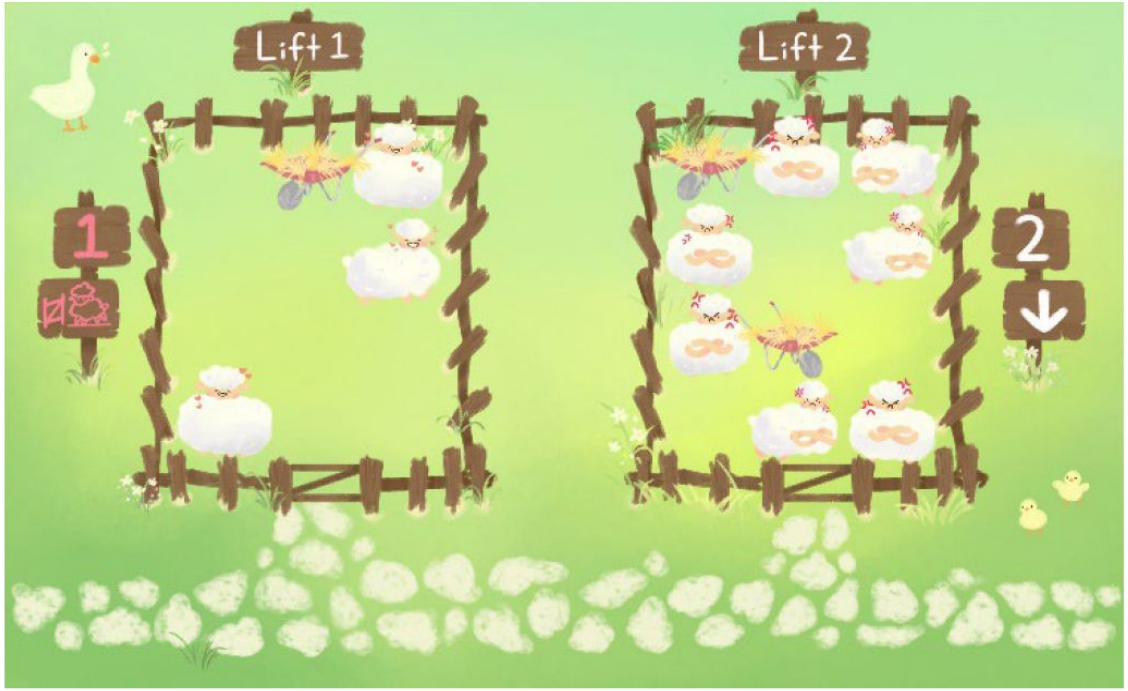


Final design for display

1-4 pax 5-8 pax 9-12 pax

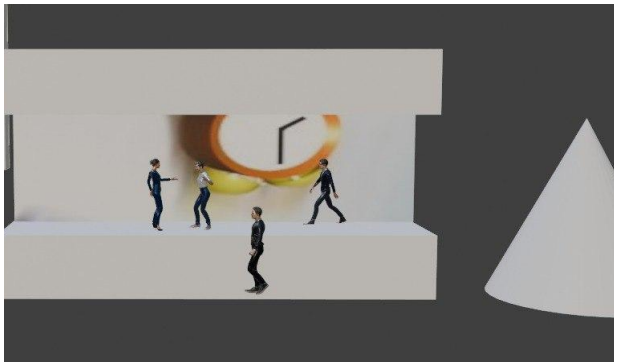


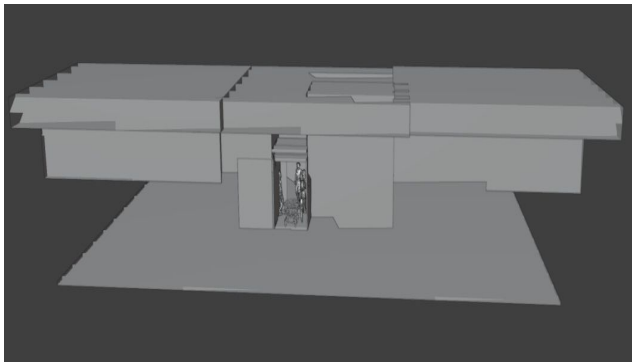
Different sheep variations to create visual interest to portray the capacity of the lift and the types of users inside - eg. people with bulky belongings such as strollers or trolleys.

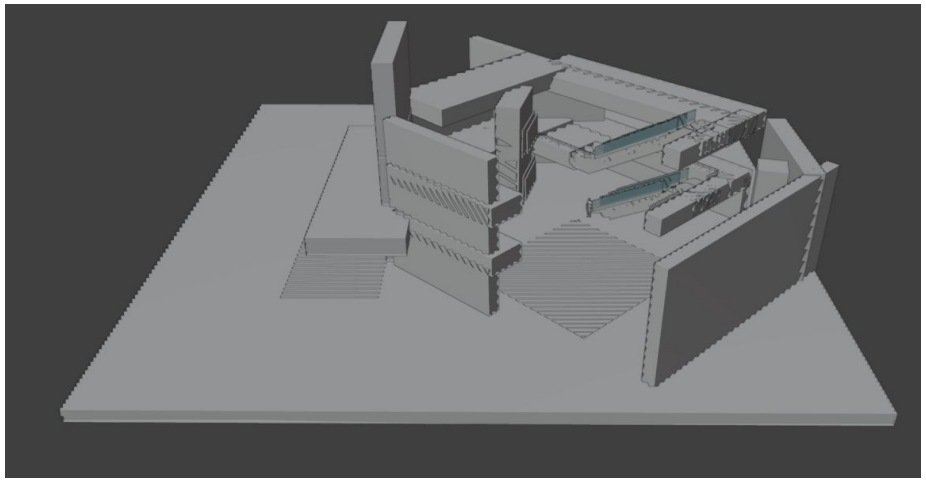


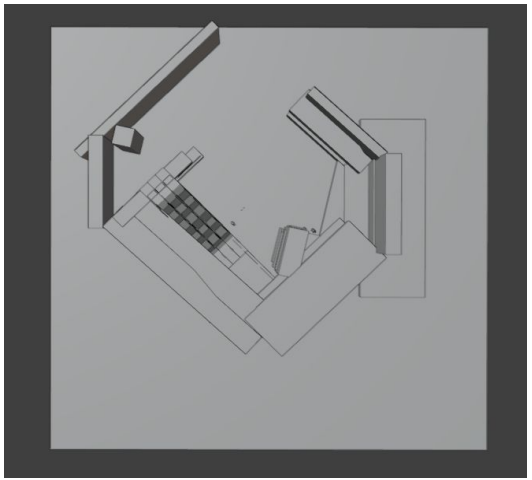
Creating 3D site renderings

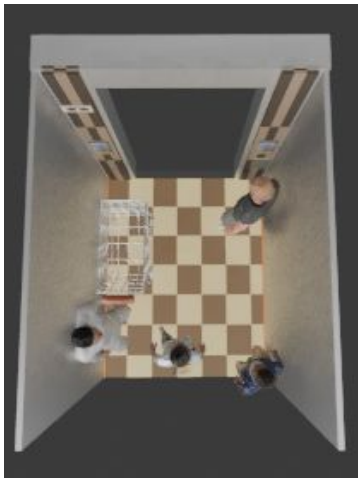
For 3D CAD-ing of our site (East point mall) and our project solution (LambLens), we decided to use Blender. Here are some images of early exploration of Blender tools such as animation, and creating the structure of the site for the A1 poster and Kickstarter video animations.





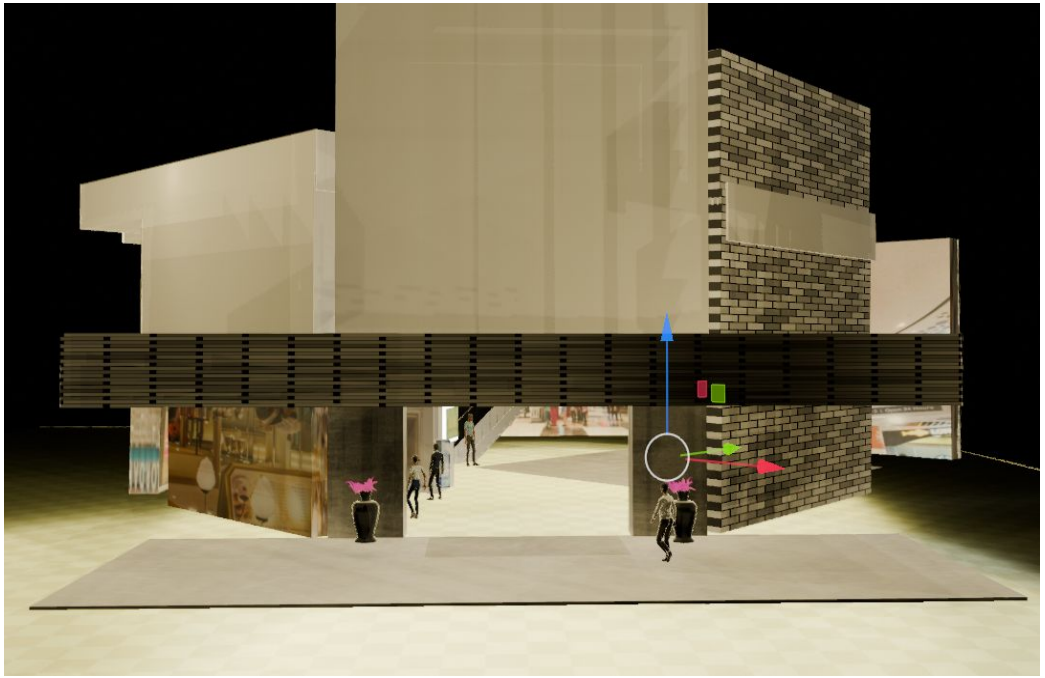




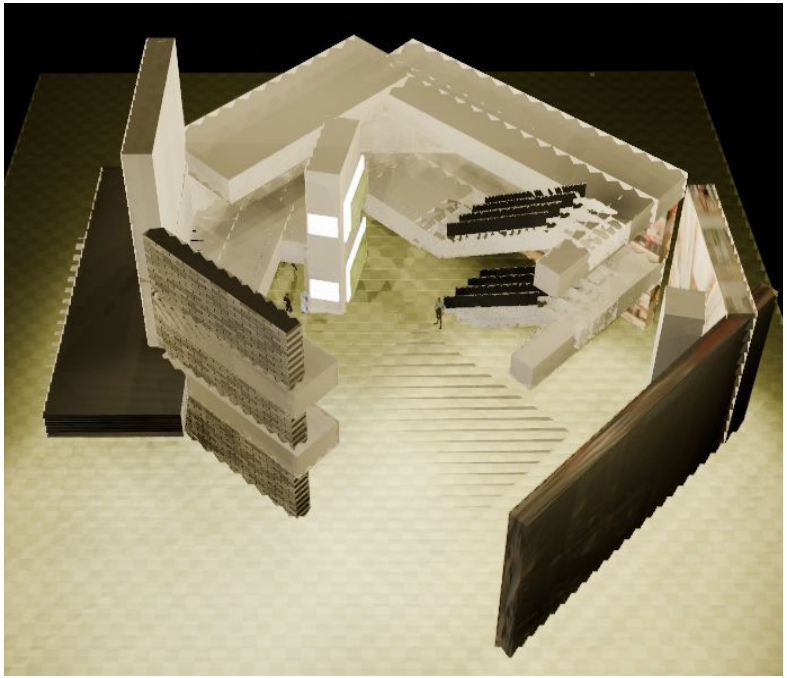


Rendered versions

After much refining of the version of East Point Mall, here are the final rendered versions.



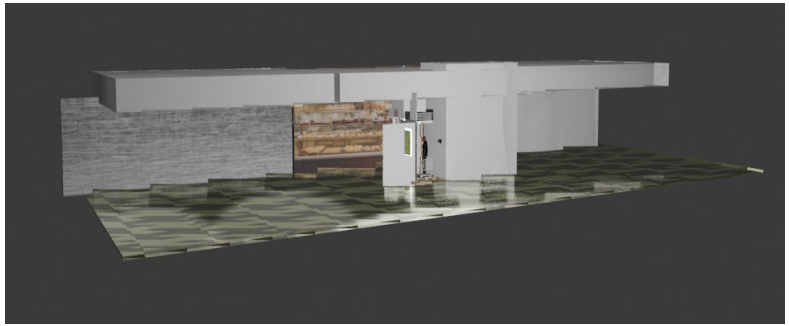
Front view of East point Mall



1st and 2nd floor view

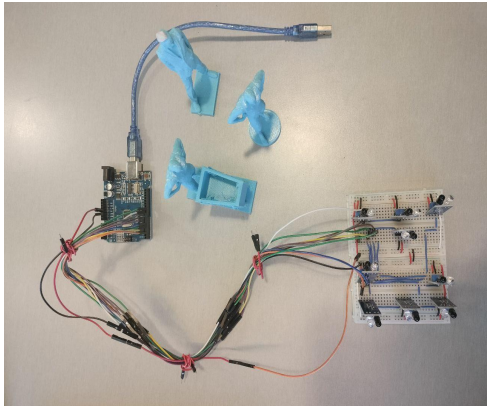
Rendered versions

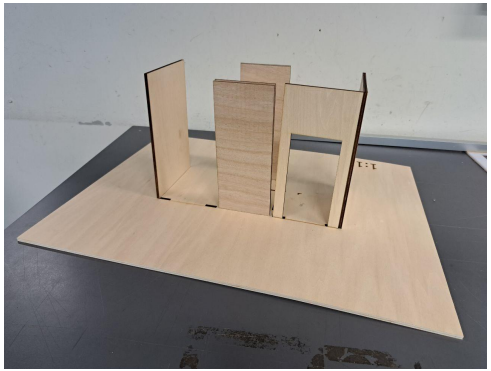
More images of fleshed out interiors of East point Mall.

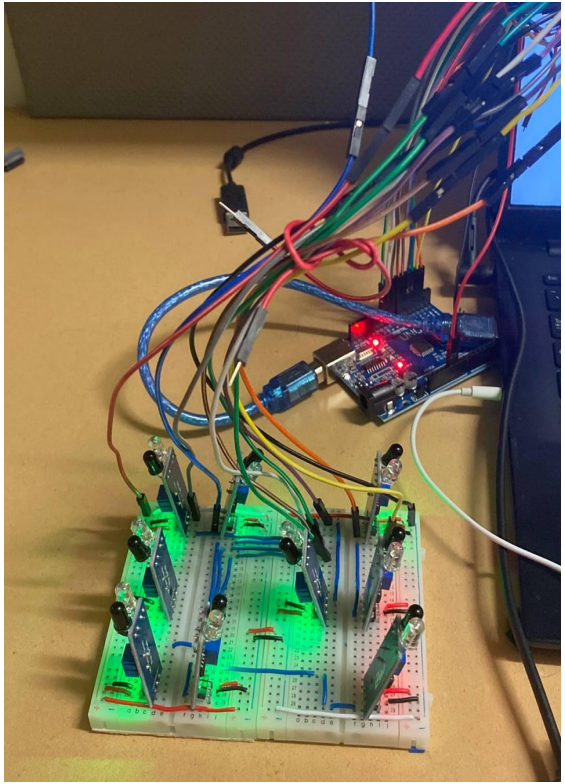


- Top left: Full view of LambLens
- Top right: A view of the lift lobby in the East point Mall Blender model
- Bottom left: A separate model of the East point Mall main lift lobby to make the animations for the Kickstarter video

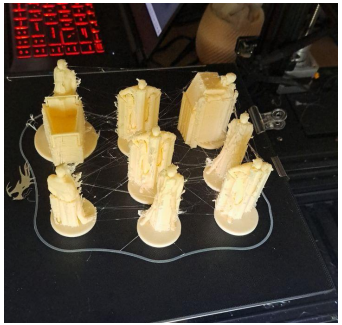
Functional model

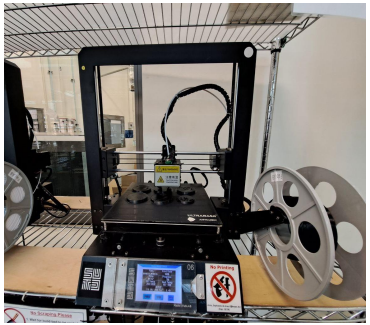






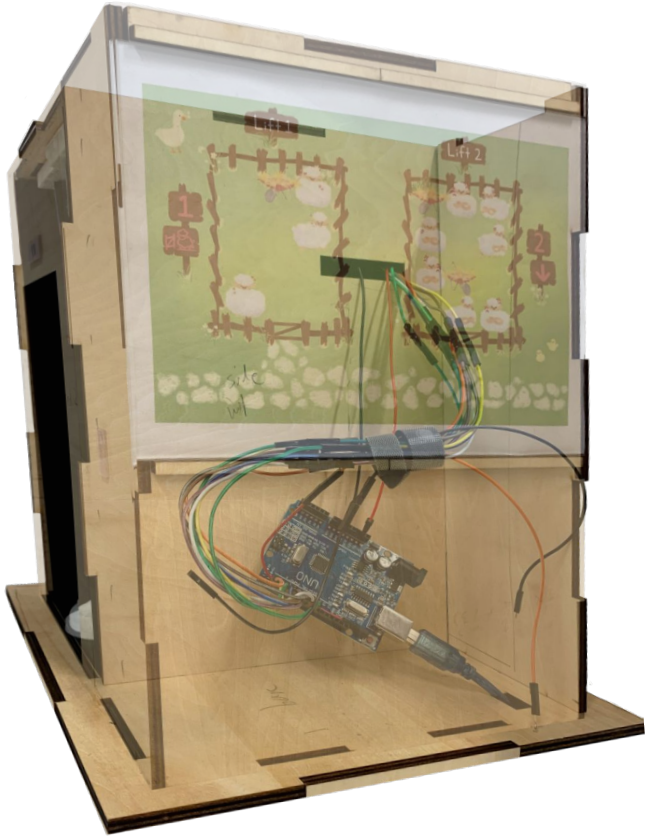
Evolution of scaled down model of people to ensure that they can be detected by the sensors





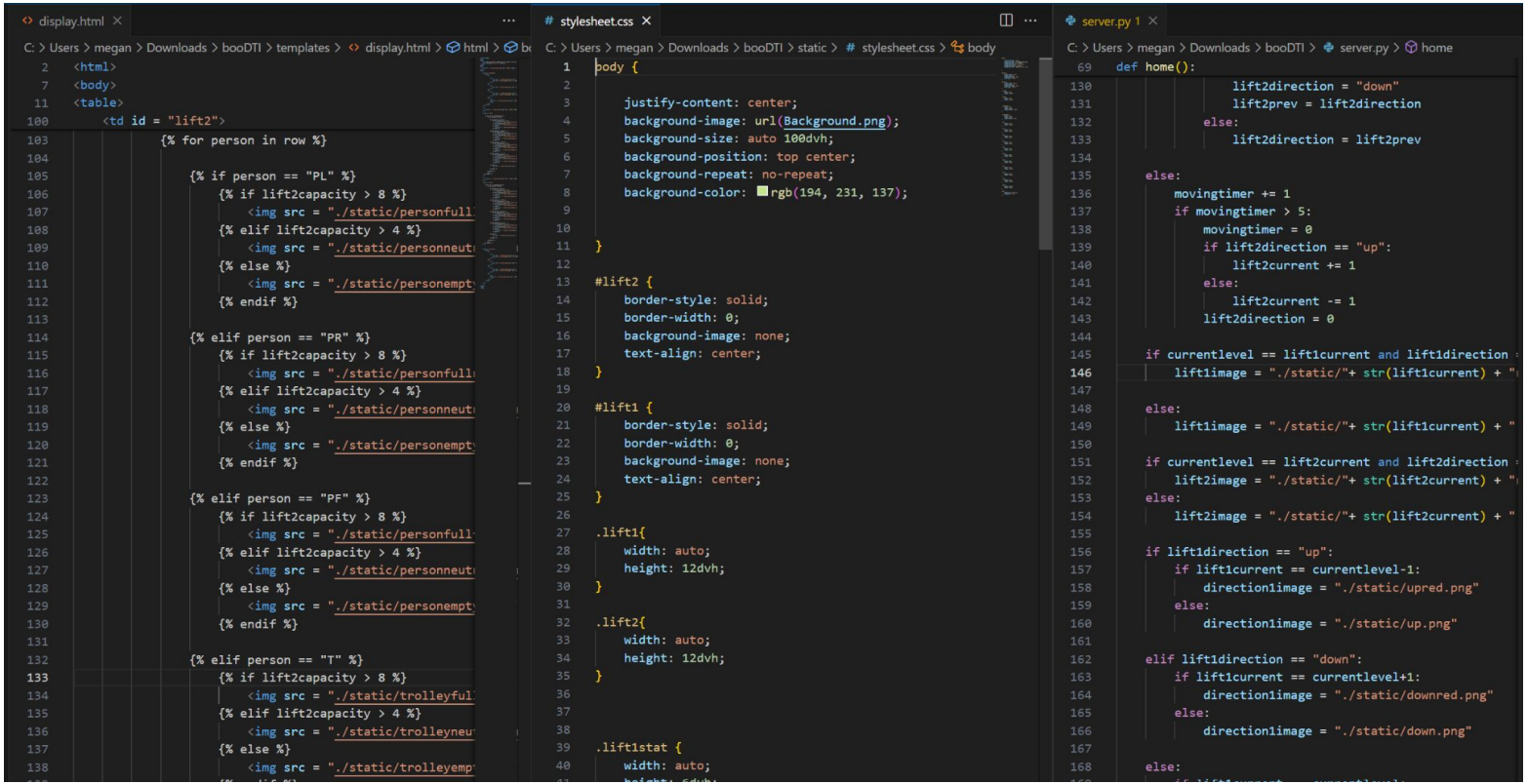
Initial parts of the functional model to evaluate feasibility of solution implementation on a simplified scale

Functional model completed



1 : 10
Functional model containing a circuit consisting of sensors, wires, breadboard, microcontroller connected to an external computer and display screen.

Functional model completed



display.html

```
<html>
<body>
<table>
    <td id = "lift2">
        {% for person in row %}

            {% if person == "PL" %}
                {% if lift2capacity > 8 %}
                    <img src = "./static/personfull
                {% elif lift2capacity > 4 %}
                    <img src = "./static/personneut
                {% else %}
                    <img src = "./static/personempt
                {% endif %}

            {% elif person == "PR" %}
                {% if lift2capacity > 8 %}
                    <img src = "./static/personfull
                {% elif lift2capacity > 4 %}
                    <img src = "./static/personneut
                {% else %}
                    <img src = "./static/personempt
                {% endif %}

            {% elif person == "PF" %}
                {% if lift2capacity > 8 %}
                    <img src = "./static/personfull
                {% elif lift2capacity > 4 %}
                    <img src = "./static/personneut
                {% else %}
                    <img src = "./static/personempt
                {% endif %}

            {% elif person == "T" %}
                {% if lift2capacity > 8 %}
                    <img src = "./static/trolleyful
                {% elif lift2capacity > 4 %}
                    <img src = "./static/trolleyneu
                {% else %}
                    <img src = "./static/trolleyemp
```

stylesheet.css

```
body {

    justify-content: center;
    background-image: url(Background.png);
    background-size: auto 100dvh;
    background-position: top center;
    background-repeat: no-repeat;
    background-color: rgb(194, 231, 137);


}

#lift2 {
    border-style: solid;
    border-width: 0;
    background-image: none;
    text-align: center;
}

#lift1 {
    border-style: solid;
    border-width: 0;
    background-image: none;
    text-align: center;
}

.lift1{
    width: auto;
    height: 12dvh;
}

.lift2{
    width: auto;
    height: 12dvh;
}


.lift1stat {
    width: auto;
```

server.py 1

```
def home():
                lift2direction = "down"
                lift2prev = lift2direction
            else:
                lift2direction = lift2prev

    else:
        movingtimer += 1
        if movingtimer > 5:
            movingtimer = 0
            if lift2direction == "up":
                lift2current += 1
            else:
                lift2current -= 1
            lift2direction = 0

    if currentlevel == lift1current and lift1direction
        lift1image = "./static/"+ str(lift1current) + "

    else:
        lift1image = "./static/"+ str(lift1current) + "

    if currentlevel == lift2current and lift2direction
        lift2image = "./static/"+ str(lift2current) + "
    else:
        lift2image = "./static/"+ str(lift2current) + "

    if lift1direction == "up":
        if lift1current == currentlevel-1:
            direction1image = "./static/upred.png"
        else:
            direction1image = "./static/up.png"

    elif lift1direction == "down":
        if lift1current == currentlevel+1:
            direction1image = "./static/downred.png"
        else:
            direction1image = "./static/down.png"

    else:
```

Final program used to comprehend information received from sensors to generate live display.

Functional model completed

DTI_Sensor | Arduino 1.8.16

File Edit Sketch Tools Help

DTI_Sensor §

```
int sensor1 = 2;
int sensor2 = 3;
int sensor3 = 4;
int sensor4 = 5;
int sensor5 = 6;
int sensor6 = 7;
int sensor7 = 8;
int sensor8 = 9;
int sensor9 = 10;

void setup() {
  Serial.begin(9600);
  pinMode(sensor1, INPUT);
  pinMode(sensor2, INPUT);
  pinMode(sensor3, INPUT);
  pinMode(sensor4, INPUT);
  pinMode(sensor5, INPUT);
  pinMode(sensor6, INPUT);
  pinMode(sensor7, INPUT);
  pinMode(sensor8, INPUT);
  pinMode(sensor9, INPUT);
}

void loop() {
  int state1 = !digitalRead(sensor1);
  int state2 = !digitalRead(sensor2);
  int state3 = !digitalRead(sensor3);
  int state4 = !digitalRead(sensor4);
  int state5 = !digitalRead(sensor5);
  int state6 = !digitalRead(sensor6);
  int state7 = !digitalRead(sensor7);
  int state8 = !digitalRead(sensor8);
  int state9 = !digitalRead(sensor9);

  int states[9] = {state1, satae2, state3, state4, state5, state6, state7, state8, state9};
  String result = "";
  int i = 0;

  for (i = 0; i < 9; i++) {
    result += String(i+1) + String(states[i]);
    if (i < 8) {
      result += ",";
      }
    }

  Serial.println(result);
  delay(1000);
}
```

Untitled_0 *

File Session Edit Connection Macros View Remote Window Help

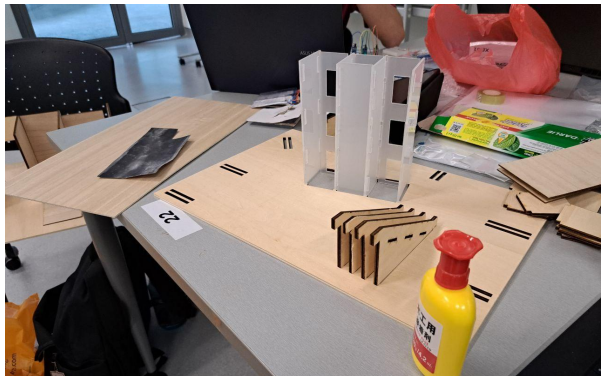
New Open Save Connect Disconnect Options Clear Data View Help

```
10,20,30,40,50,60,71,81,91
10,20,30,40,50,60,71,81,91
10,20,30,40,50,60,71,81,91
10,20,30,40,50,60,71,81,91
10,20,30,40,50,60,71,81,91
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
10,20,30,40,50,60,70,80,90
```

Final program used to comprehend information received from sensors to generate live display.

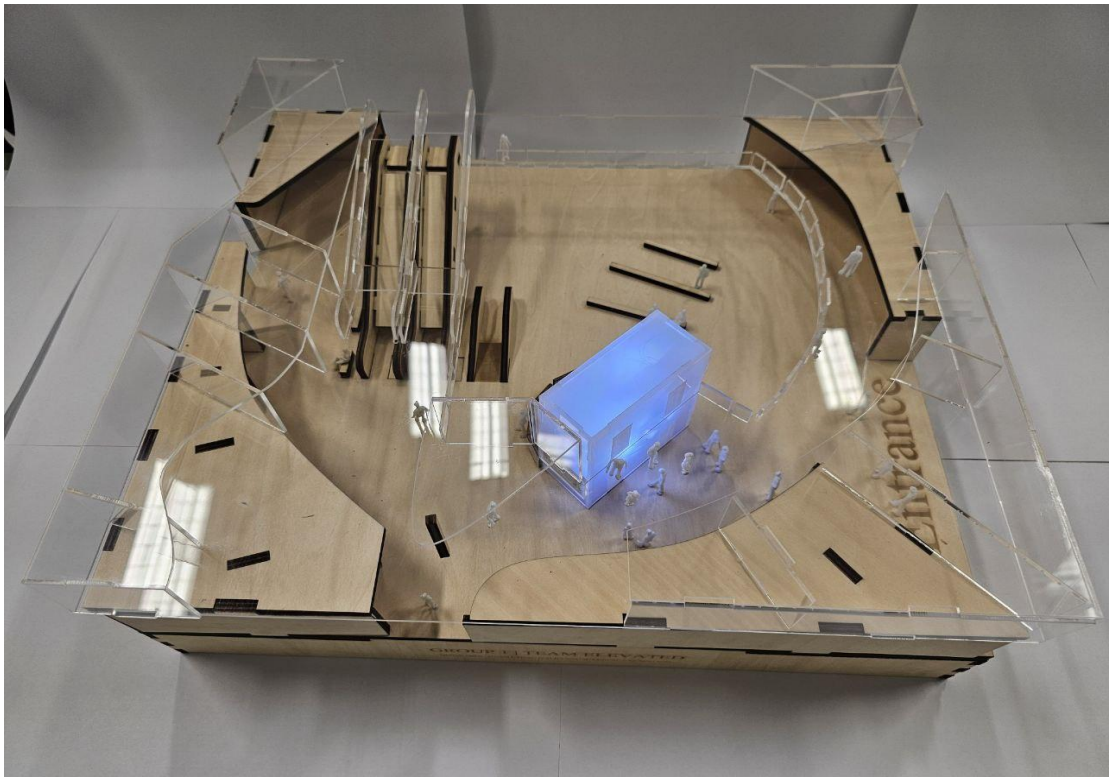
Functional model demo

Scaled model



First attempt of building scaled model

Building the first floor of model (2nd version)



Completed 1:75 model (topview)

Scaled model completed