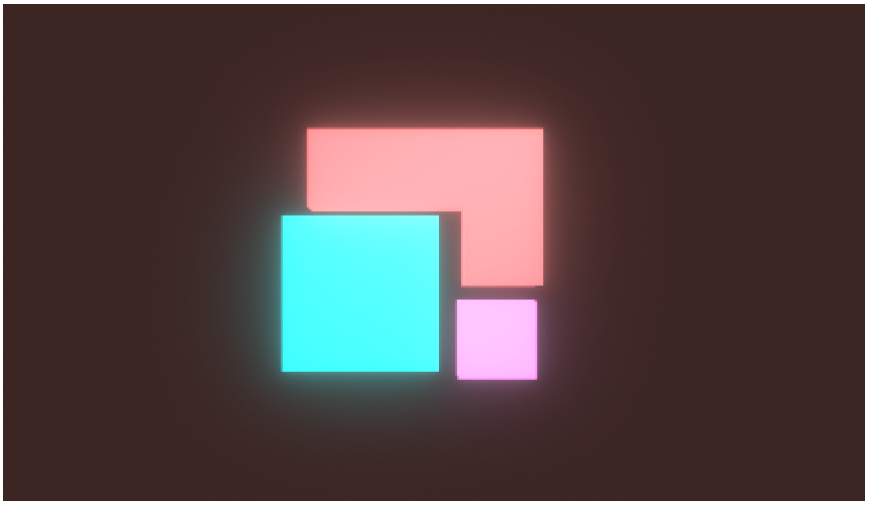
L O G P R O J E C T P R O G R E S S

Fiona
Chong In Lei

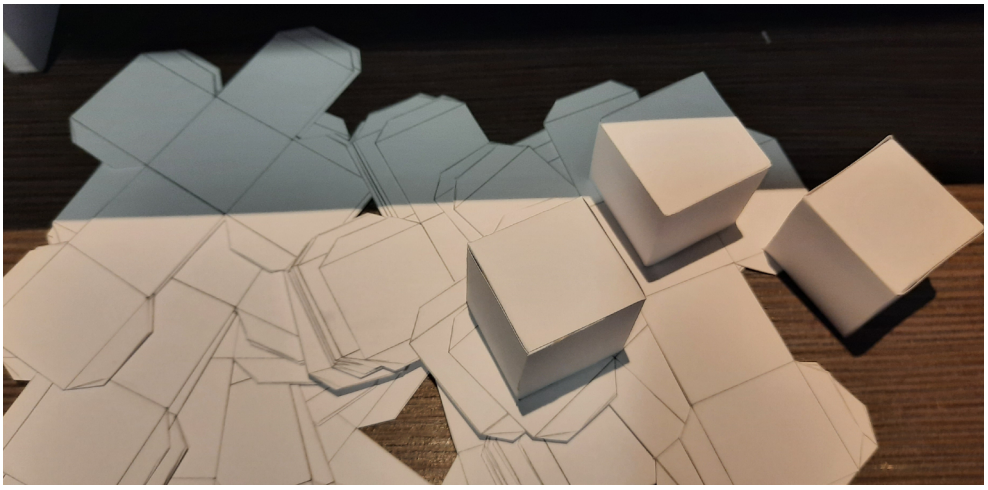
C U B e



Download available at: https://muzitua.itch.io/cube
Github (all materials):
https://github.com/muziFiona/CCI_Final_CUBe
Unity code:
https://drive.google.com/file/d/1WNd-qhOSk1enf-GOeLSnUmk-1yfH5AK6h/view
Play view: https://youtu.be/6PwUuf-9ljg
Textures view: https://youtu.be/ZoFK_3SN0Jo

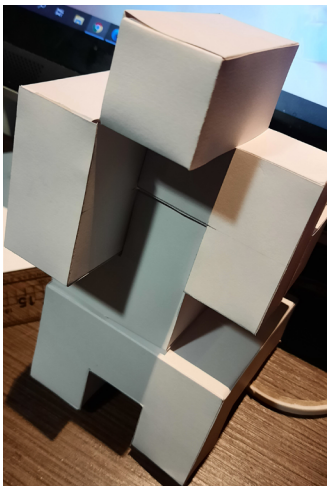
Production Tech: Blender
Unity3D
Paper for Prototype

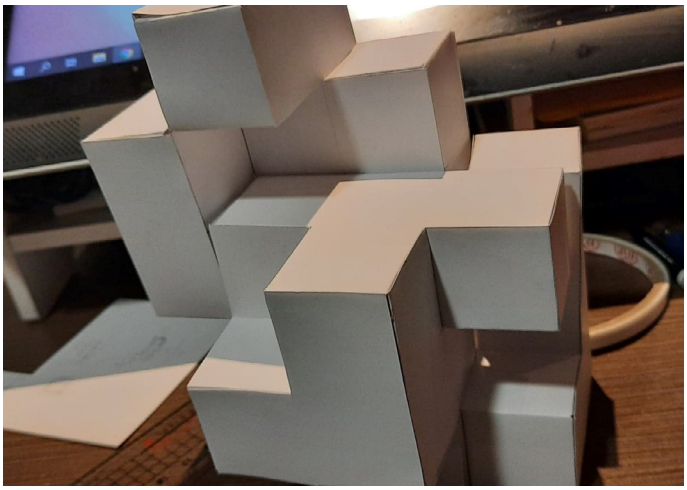
CUBe is a digital installation that allows you to take control over shapes and structure. I am hoping to bring out the concept of the medium that had introduced by Marshall McLuhan in the 1960s, the time before digital games and the TV were just introduced to the public. Feel the control you have with the shapes and feel the message from the twisted textures over the body.



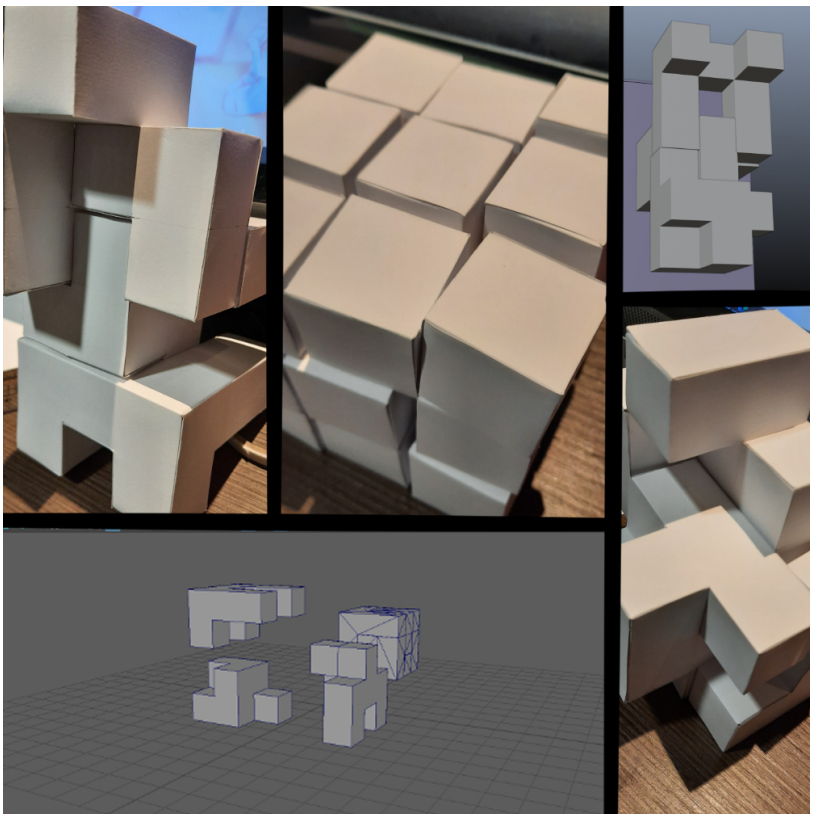
Proto-type

I always wonder what we can do or have experience with a simple shape, where lots of imagination can be brought out with one form; such as Barbican Box Music project, which expands thoughts and ideas through a box. To begin with the project, I made prototype of cubes; 27 little cubes are made to build one large cube, and I play with these particles to see what can be expanded through these cubes. I split the cube into 3 equivalent parts and build some abstract forms with 9 cubes each. With only one direction and angle, those 3 parts can reform the shape of a cube, in another way, they build up more abstract forms that no one can realise they use to be one cube.



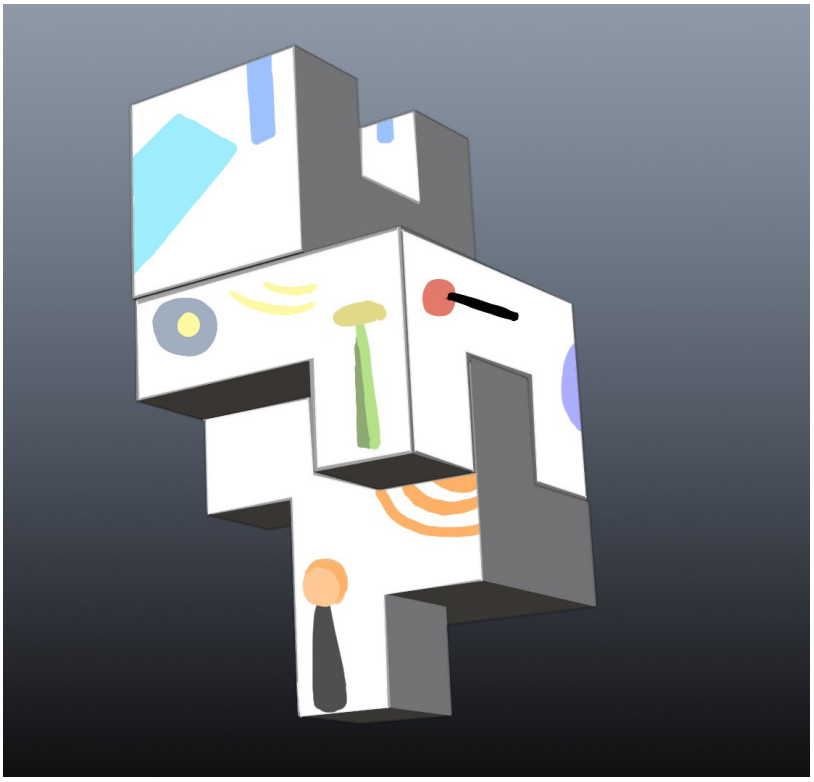


MODELLING and MAPPING



After finished prototyping, I started building my concept digitally in Blender, transforming the cube experience into a virtual space. The idea for my project is still quite loose at this point; more media theory and game designs are being looked up to open up my concept and carry out my plan for the art-game piece. I search for Minimalist works to support my idea of using simple shapes. In research of Minimalism, both 3D (such as architecture) and 2D (paintings) works give me a better sense of how shapes can be performed and how complex ideas can be implied into the structures.

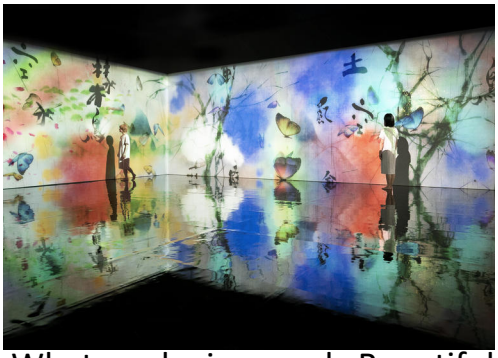
paper model - restructure the cubes



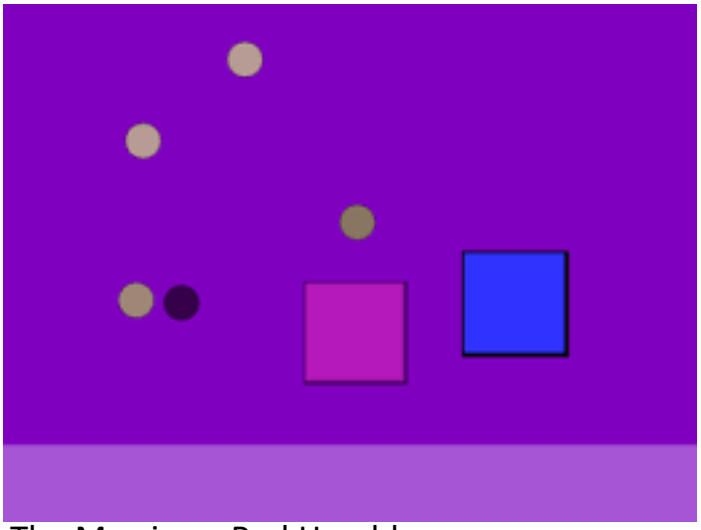
I have also looked at books about media transformation and presentation of shapes within games to enrich the core meaning in my practice, more theoretical research can be found in my thesis which explores the effects of forms as the medium that transfer message to the audience. With various transformation the cube components can make, I want to see how the visuals can be developed beyond this. The figure on the left is my initial concept of how textures could be mapped or projected over a structure, as I am going to build a project digitally, method of projection could be easier than any immersive projection project in physical space.

3D models in Blender with concpet of texture

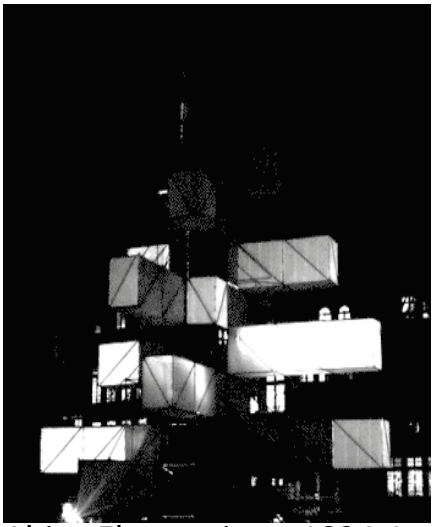
MIND-MAPPING



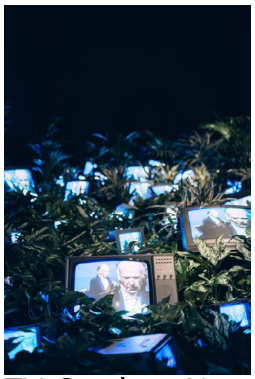
What a loving and Beautiful world, by teamLab



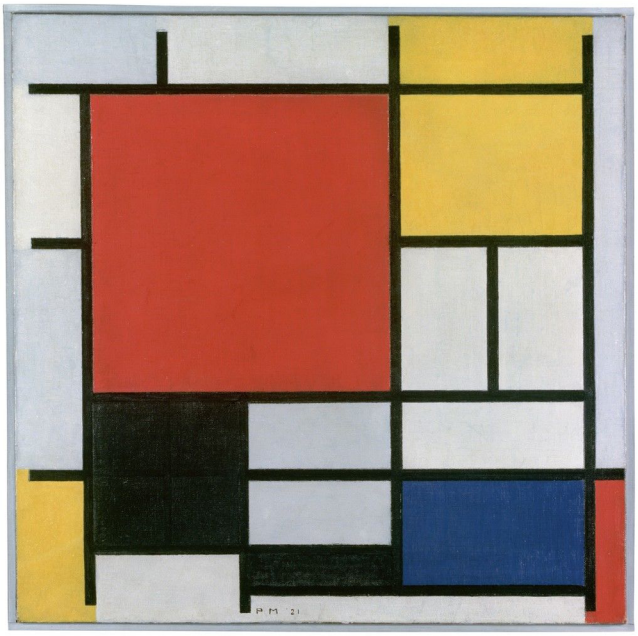
The Marriage, Rod Humble



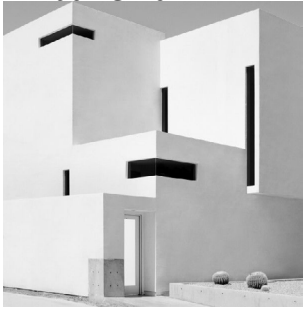
Abies Electronicus ,1024 Architecture



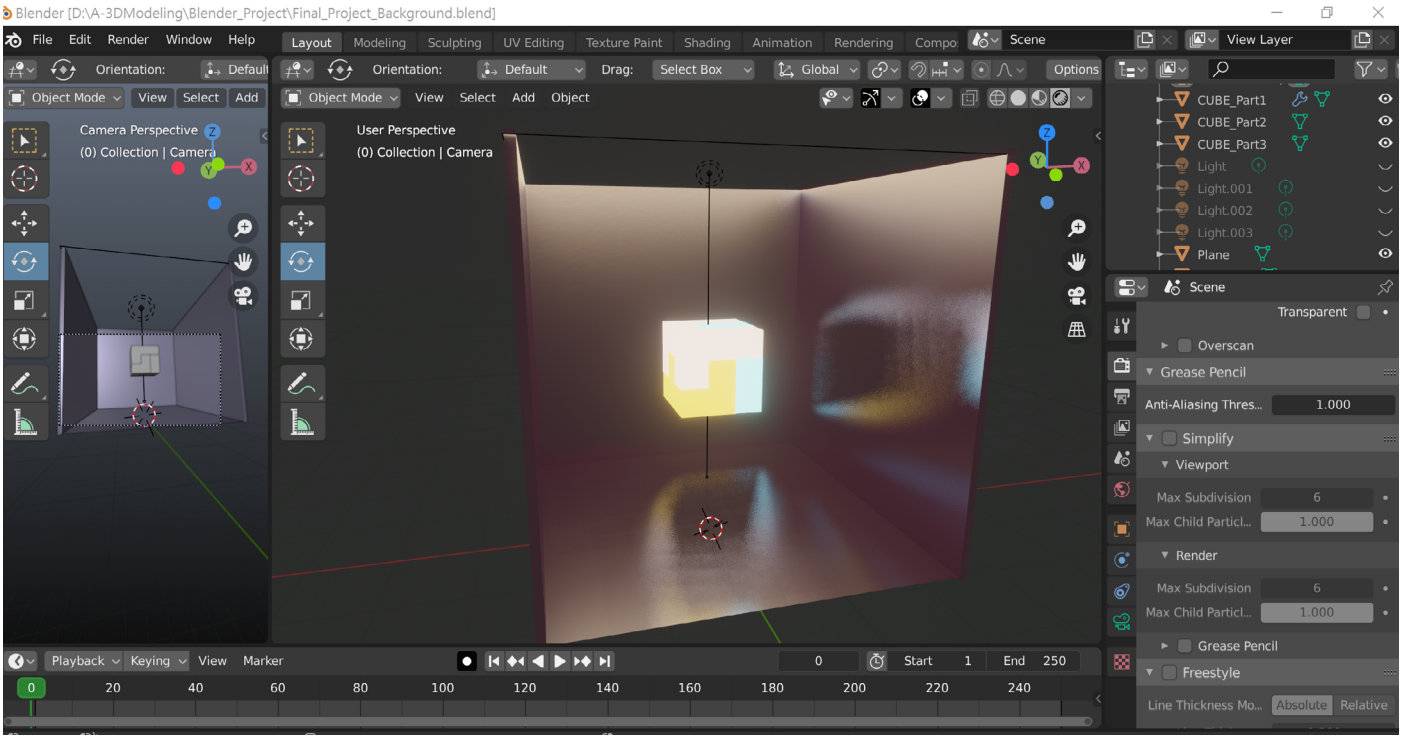
TV Garden, Nam June Paik



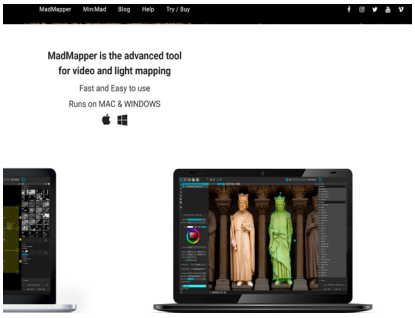
Artworks by Piet Mondrian



B U I L D I N G



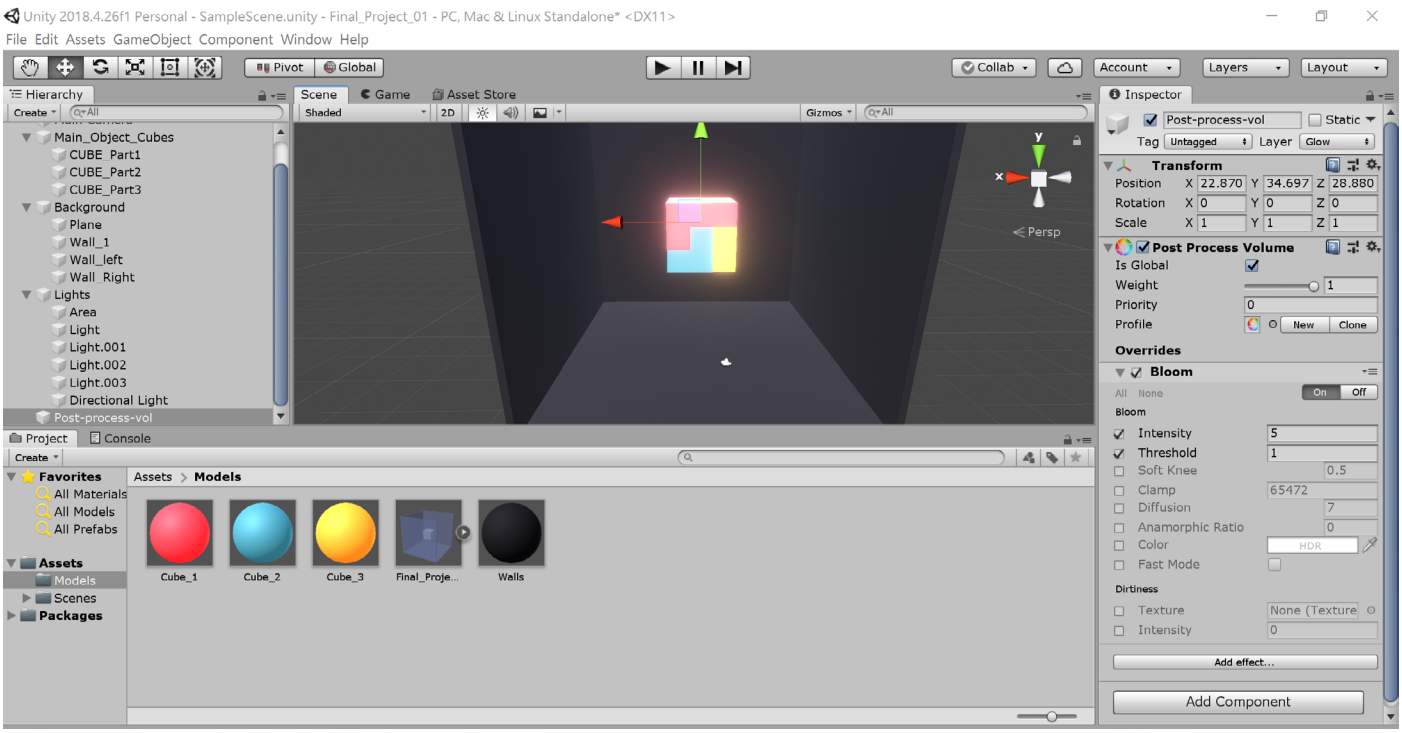
Initial concept scene in Blender



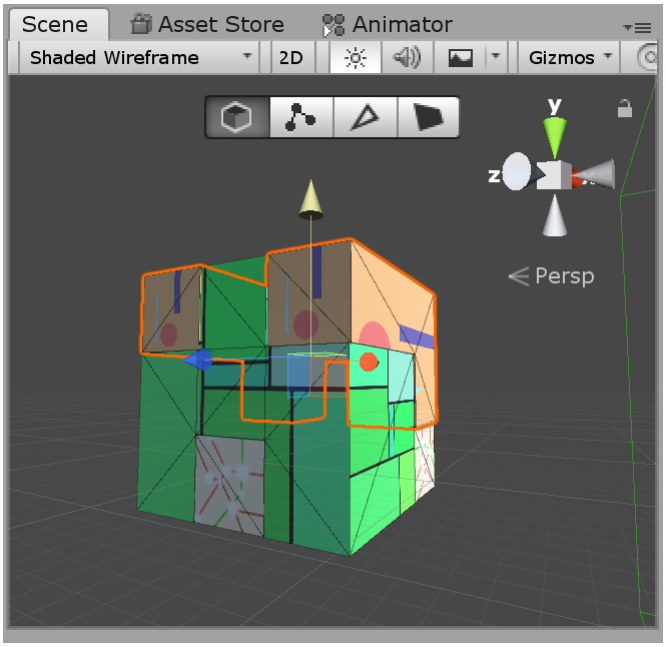
Map mapper was introduced to me by my tutor as one way of showing visuals on top of an object. However, as my idea is likely to base on a virtual environment and the software (Map mapper) is more tend to present projection on a physical object such as buildings or installations. Hence, Unity3D will be a better choice for me to use in creating projection over models and also interaction.

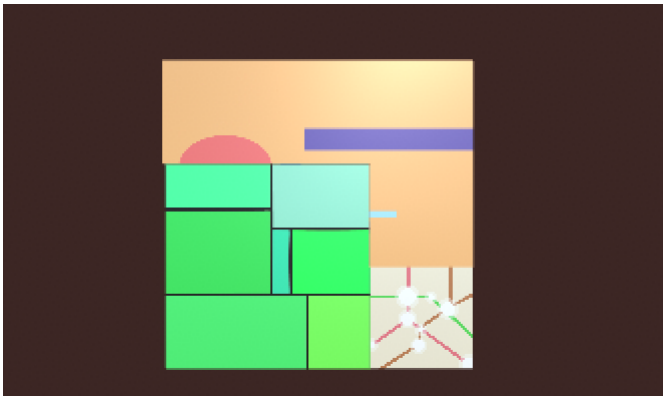
Before producing my interactive piece in Unity3D, firstly I built the conceptual design of the environment in Blender and did experiments about lightings and position of the model. The glowing effect you can see above is what I have made for the texture in the first position, and I am going to keep this effect as a transition later on in Unity3D. To support my theoretical sections, I have studied the theory Marshall McLuhan has made about the message encodes within the medium. The transformation of medium (i.e. from a book to a drama on TV) provide me with the thoughts of presenting 'media transformation' within my production, the models of the cube will be the form of transmitting media and more visuals will be mapped on top as the message to spread. Using Unity3D could save my time in making projection over objects, as I only need to do it with the material, and insert visuals within the material.

B U I L D I N G



Rebuild in Unity3D



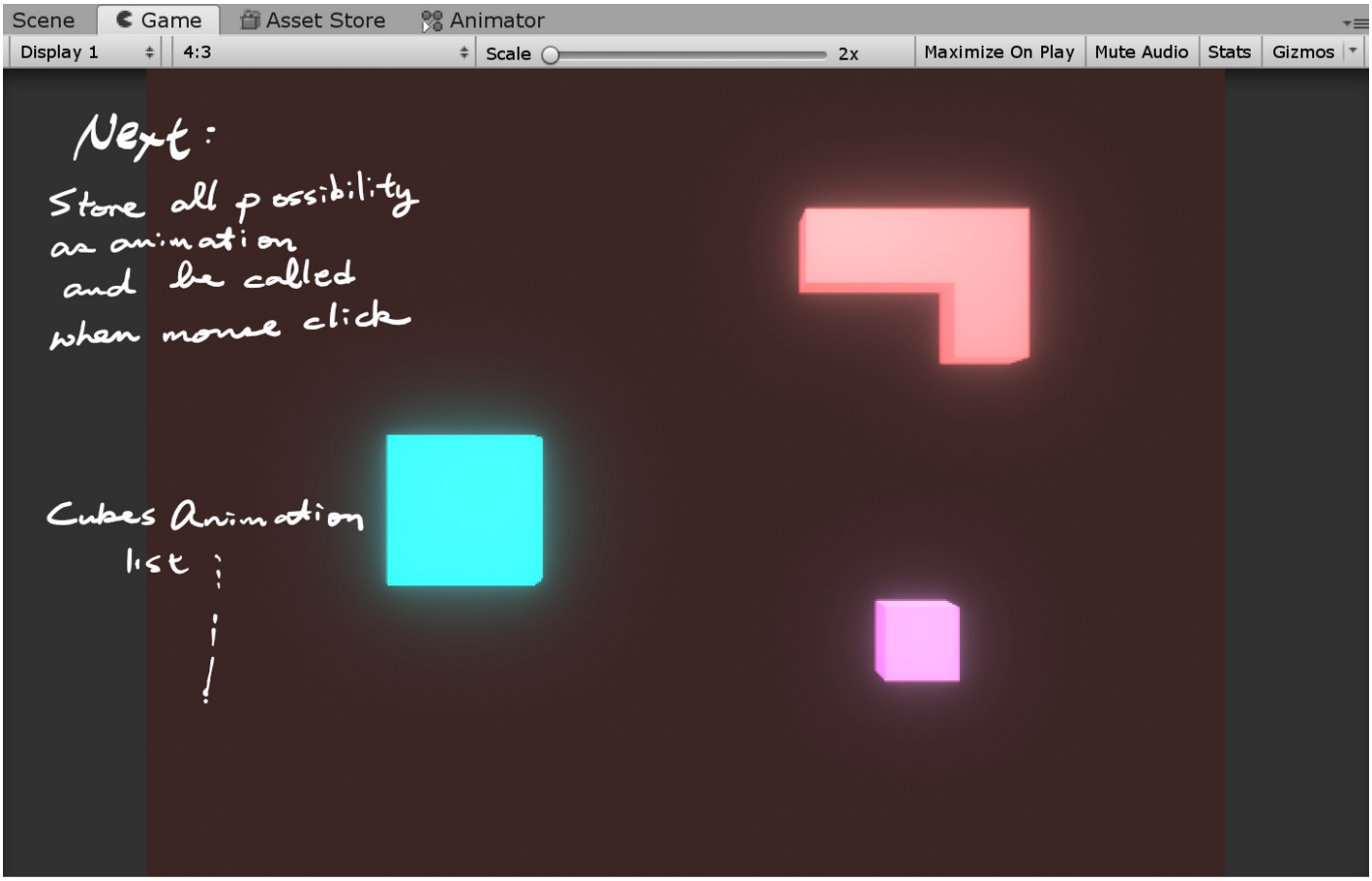


To make my 3D models interactive, they are imported into Unity3D, and all functions will be created here and fill with video materials. By making lists of 2D animations, the texture itself will change randomly while the structure of the models changed.

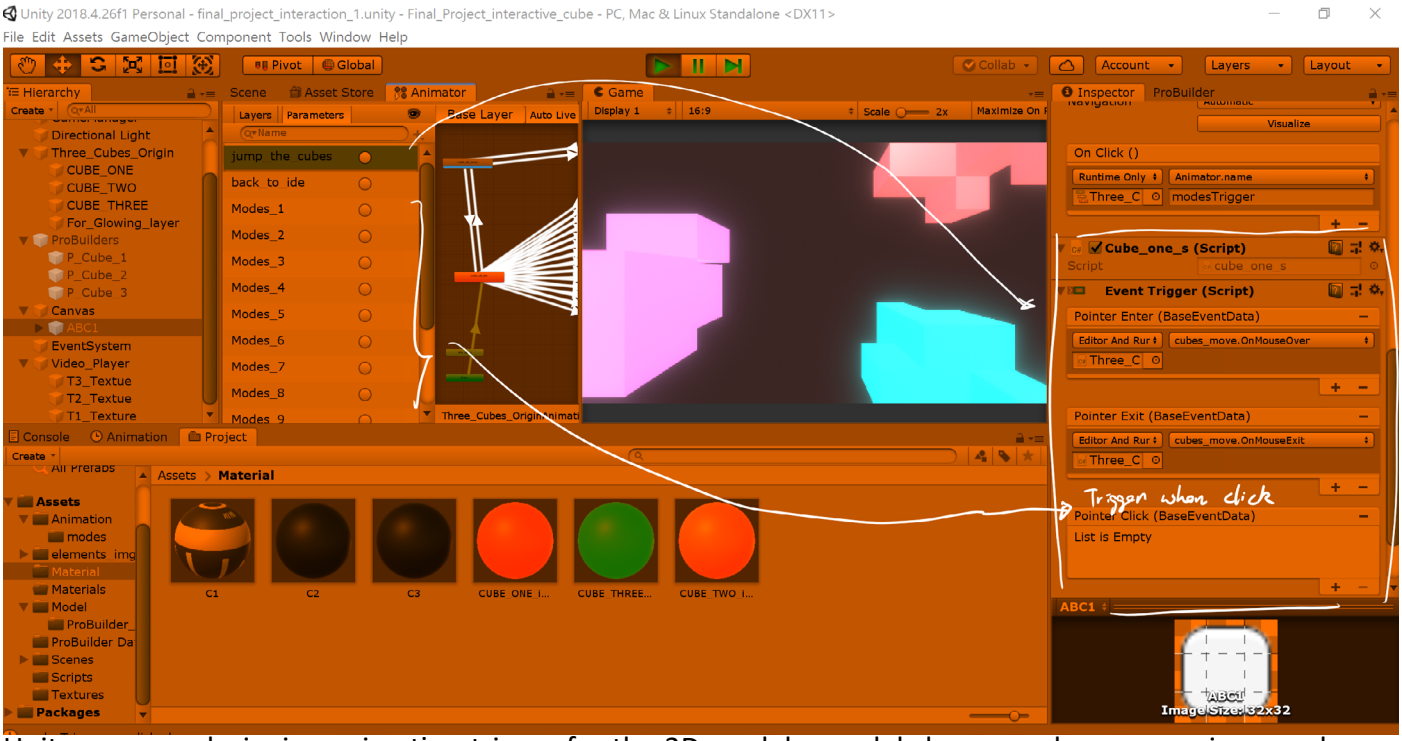
In order to achieve the models' transformation effect, I decided to use the Animation function in Unity3D which you can quickly create a different structure of the models and save them to the list; an in-between transformation will be generated when the animation is trigger between one another.

The concept is used make changes to the cube model when players interact with the piece using a mouse, only one button click is needed for function, which is simple and all the built transformation will act as an installation in virtual space.

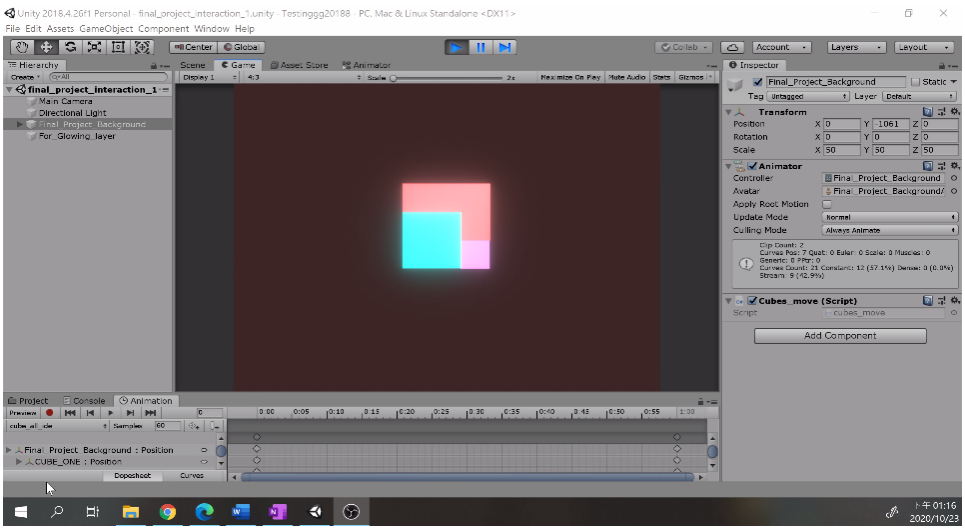
P R O C E S S

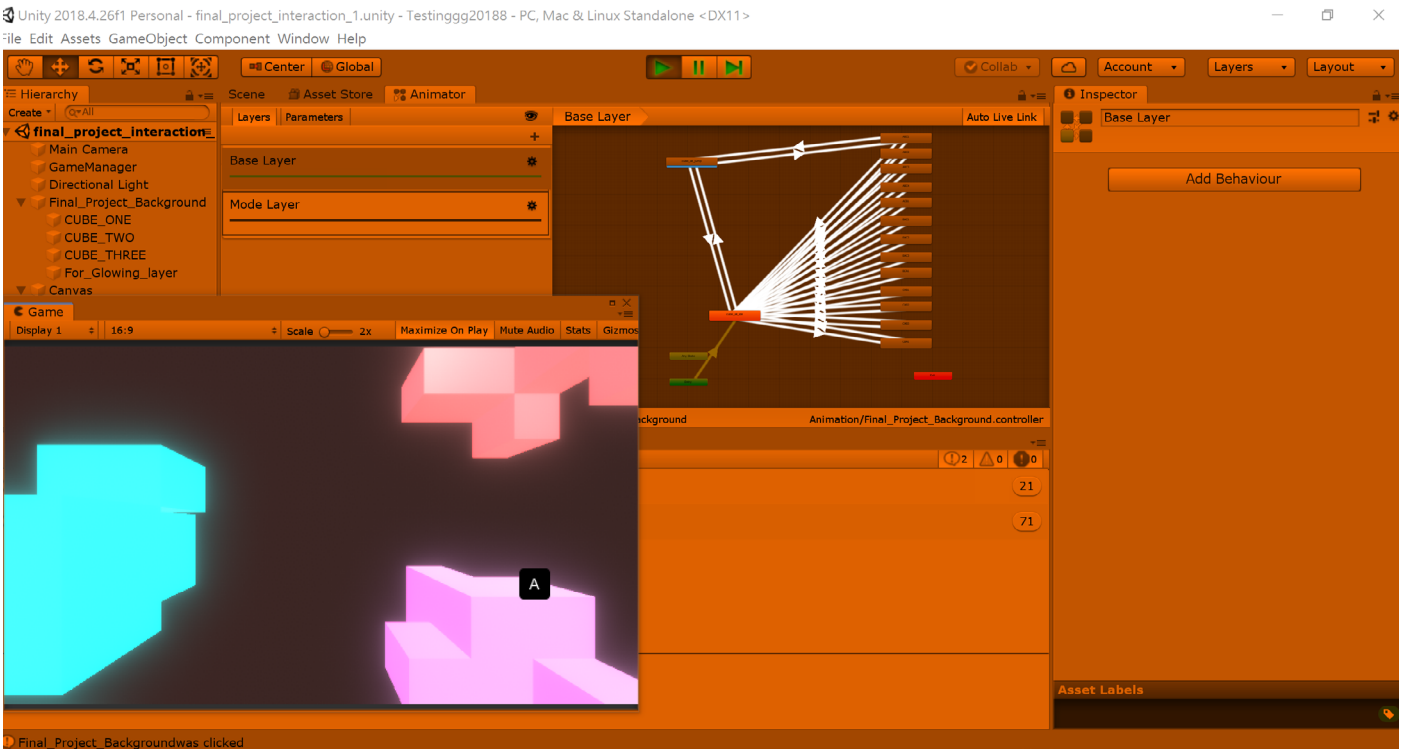


Initial concept for interaction, a default mode, a bounce mode for transformation and the final structure mode

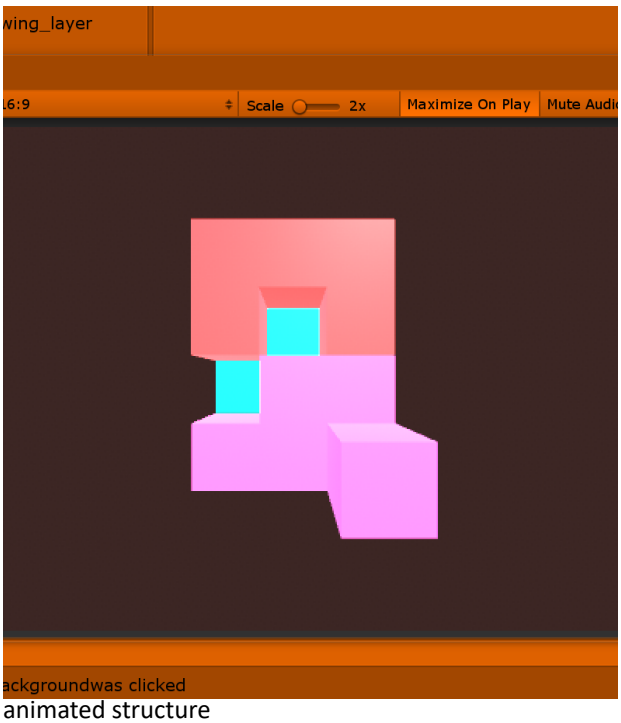


Unity process, designing animation trigger for the 3D models, models bounce when mouse is moved over, models combination change when mouse is clicked.



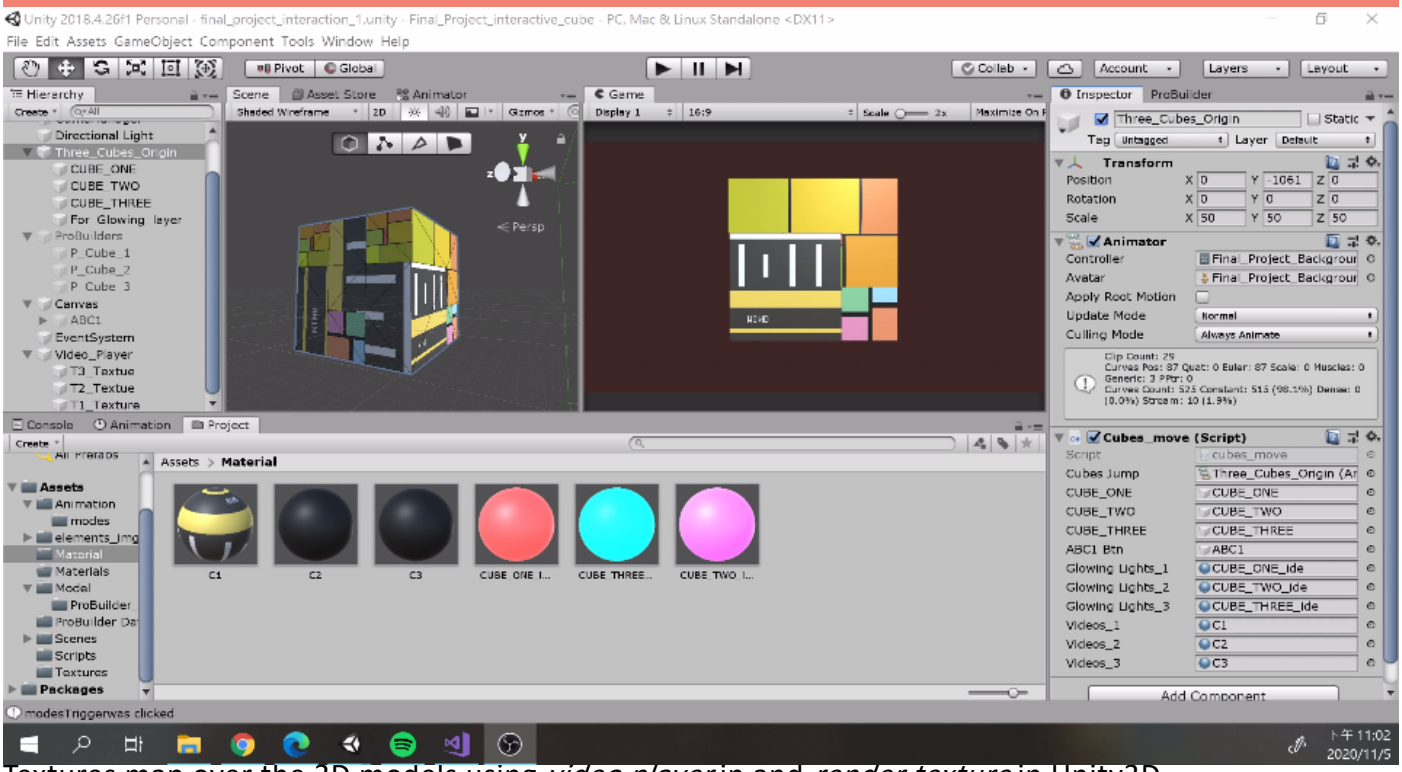


After a list of animations is created, it comes to the point where I need to make a trigger point when the mouse is clicked, and form the transformation from a cube structure to all other abstract shapes. However, the random generation of the animations didn't work quite well; the Mono Behaviour in the Unity script does not support random string mode for the animations. Hence I made the randomization in a more complex way which was to create a script in *StateMachineBehaviour* directly in Animation state. Lots of errors occur with that method, and the problem was solved by using *Integer* and *boolean* in the *Animation Parameters*, the issue is then solved and the code for the randomization is therefore able to be put within the overall control script.

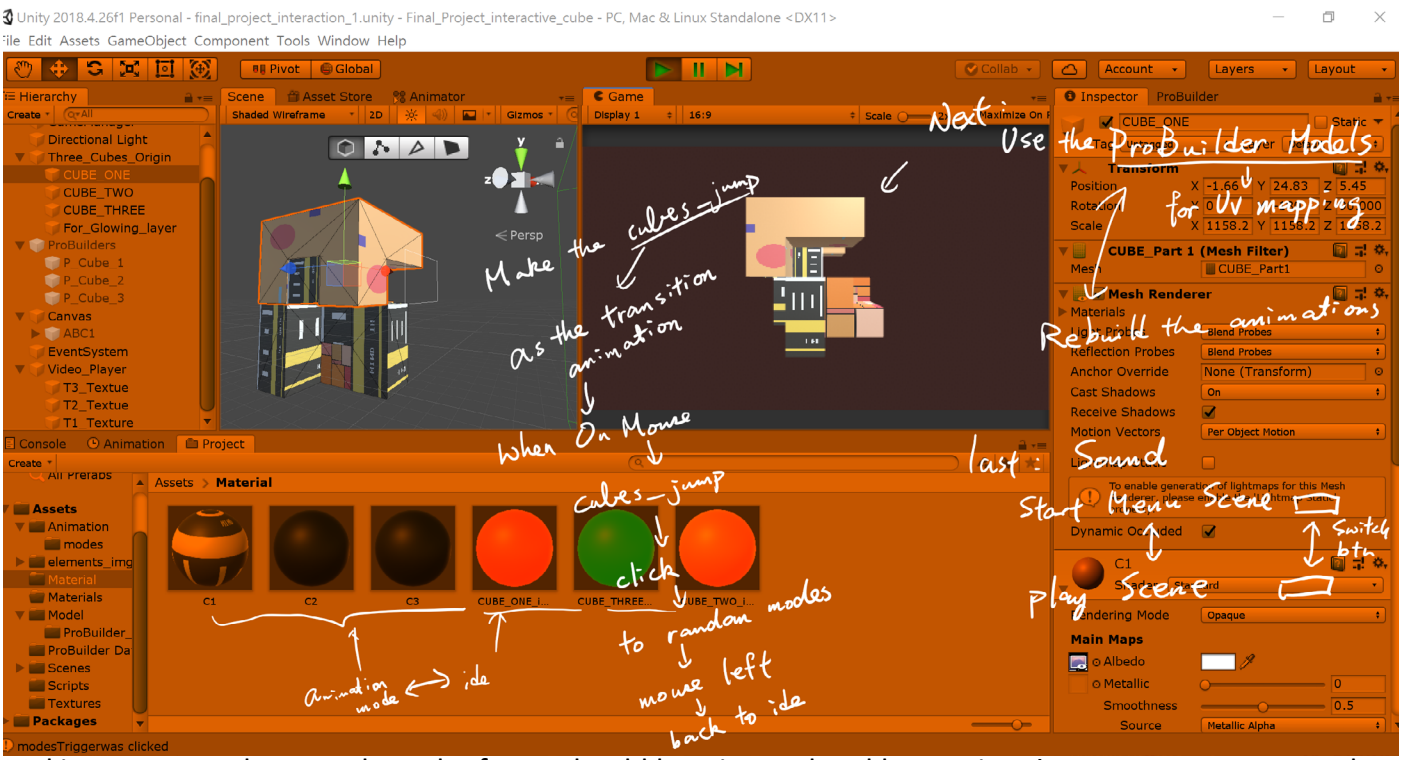


animated structure

P R O C E S S



Textures map over the 3D models using *video player* in and *render texture* in Unity3D



Making notes on changes - how the forms should be triggered and how animation textures are mapped on top the models. Problems occur about material, where UV mapping is not allowed in imported models.

P R O C E S S

```
using UnityEngine.Video;

public class RandomModesAni : StateMachineBehaviour
{

    string[] modesTriggers = { "Modes_1", "Modes_2", "Modes_3", "Modes_4", "Modes_5", "Modes_6", "Modes_7",


    // OnStateEnter is called when a transition starts and the state machine starts to evaluate this state
    //override public void OnStateEnter(Animator animator, AnimatorStateInfo stateInfo, int layerIndex)
    //{
    //
    //}

    // OnStateUpdate is called on each Update frame between OnStateEnter and OnStateExit callbacks
    override public void OnStateUpdate(Animator animator, AnimatorStateInfo stateInfo, int layerIndex)
    {
        if (Input.GetMouseButtonDown(2))//right mouse click
        {
            Random_Modes(animator);

        }


    }

    void Random_Modes(Animator animator)
    {
        System.Random random = new System.Random();
        int cubesStructure = random.Next(modesTriggers.Length);
        string modesTrigger = modesTriggers[cubesStructure];
        animator.SetTrigger(modesTrigger);
    }
```

Model-animations-randomization script in *StateMachineBehaviour*, only used in early development, changed afterwards.

```
CUBE_one.GetComponent<MeshRenderer>().material = Glowing_1;
CUBE_two.GetComponent<MeshRenderer>().material = Glowing_2;
CUBE_three.GetComponent<MeshRenderer>().material = Glowing_

d videoMaterial()

CUBE_one.GetComponent<MeshRenderer>().material = Video_1;
CUBE_two.GetComponent<MeshRenderer>().material = Video_2;
CUBE_three.GetComponent<MeshRenderer>().material = Video_3;


d finalMaterial()

CUBE_one.GetComponent<MeshRenderer>().material = final_1;
CUBE_two.GetComponent<MeshRenderer>().material = final_2;
CUBE_three.GetComponent<MeshRenderer>().material = final_3;
```

Changing material when different states triggered.

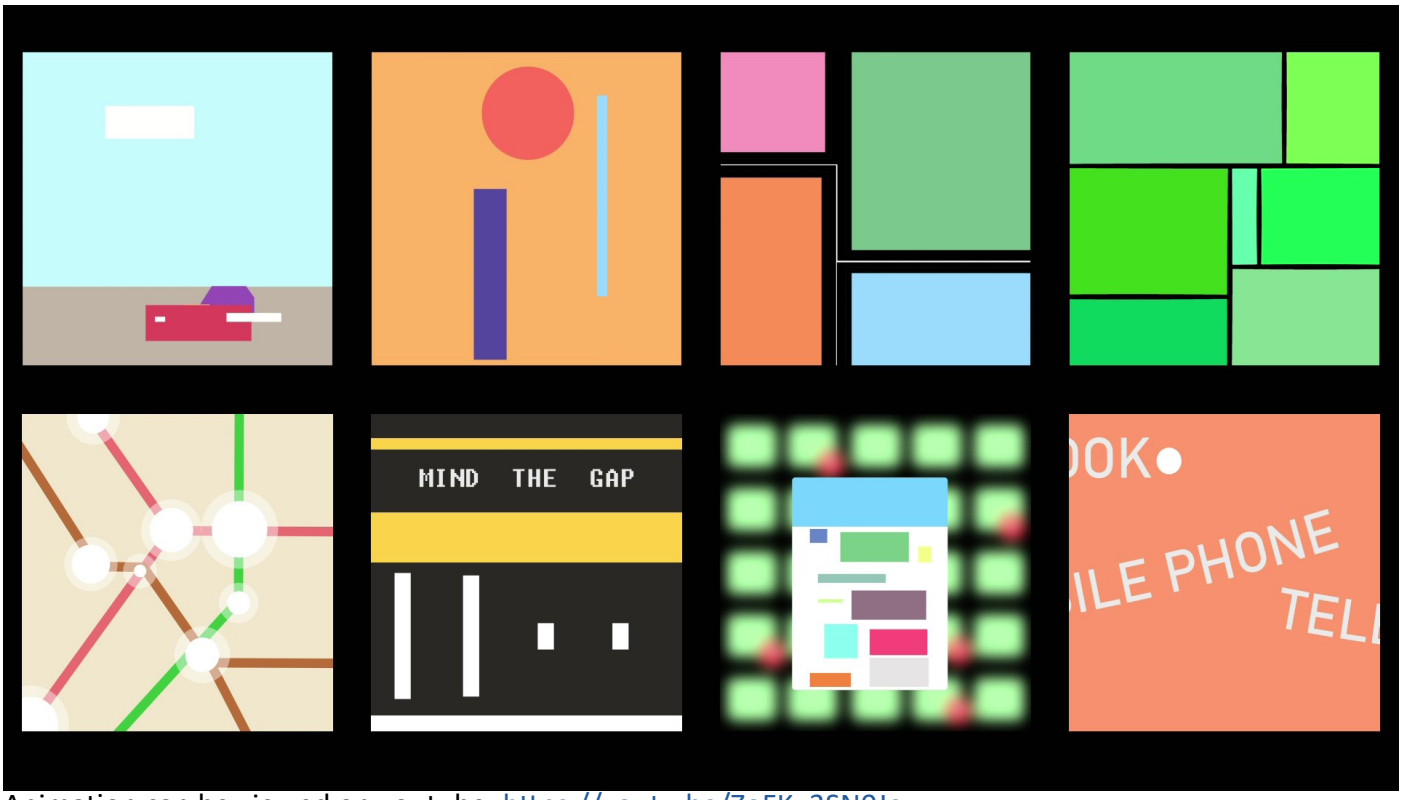
```
public void OnMouseOver() //OnMouseOver()
{

    anim.SetBool("onMouseTrigger", true);
    anim.SetBool("onClickTrigger", false);

   // FindObjectOfType<AudioManager>().Play("startMusic");
    Debug.Log("true");
    glowingMaterial();

}
public void OnMouseUp() //OnMouseUp()
{
    randomAnimation();
    anim.SetBool("onMouseTrigger", false);
    Debug.Log("Mouse Up");
}

public void OnMouseExit()//OnMouseExit()
{
    if (this.anim.GetCurrentAnimatorStateInfo(0).IsTag("change"))
    {
        anim.SetBool("onClickTrigger", true);
        anim.SetBool("onMouseTrigger", false);
```

Functions with different mouse actions, where models bounce, transform and back to origin.

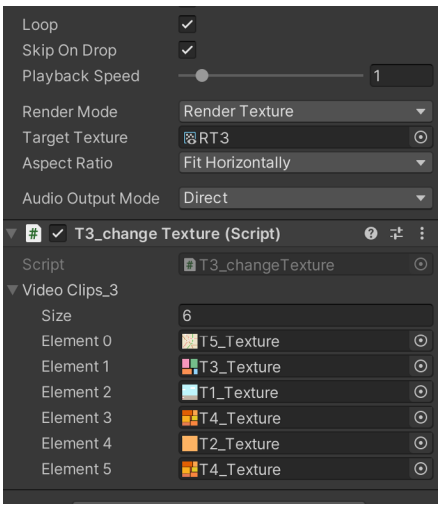
```
IEnumerator FiveSeconds()
{

    if (this.anim.GetCurrentAnimatorStateInfo(0).IsTag("final"))
    {
        finalMaterial();
        yield return new WaitForSeconds(3);
        fade.SetTrigger("Start");
        yield return new WaitForSeconds(1);
        SceneManager.LoadScene("Starting_scene");
```

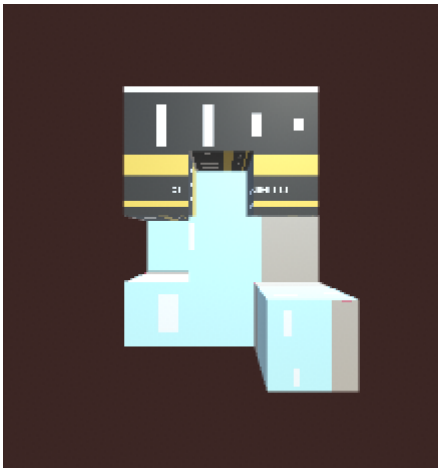
A time wait function, when the animation tag “final” is generated by players, the game ends and back to the beginning, using IEnumerator allows me to hold the animation longer and gives a fading effect before switching back to the starting scene.

T E X T U R E S



Animation can be viewed on youtube: https://youtu.be/ZoFK_3SN0Jo



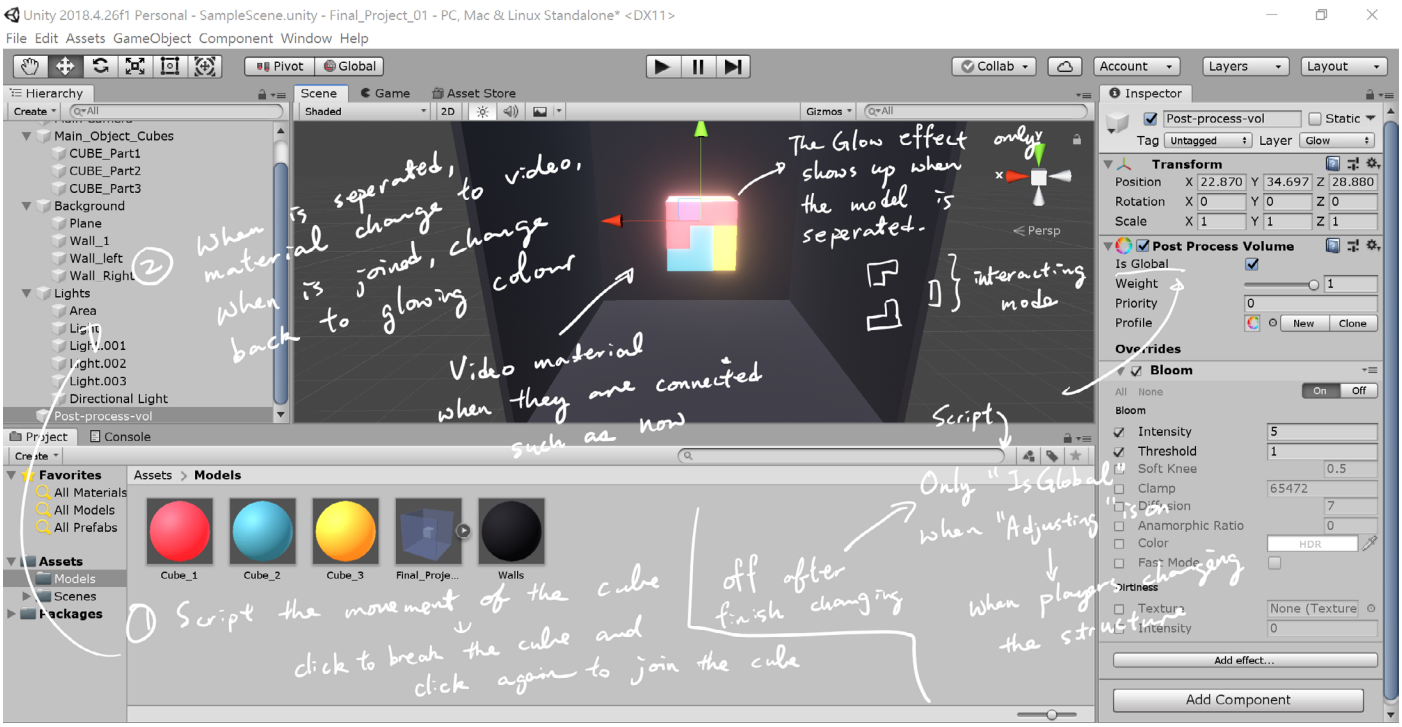


The concept of my project is to express the transformation of media; the audience won't be able to see a complete look of the content, as the content that is revised by others. Contents are reinterpreted by the people who edit, or by the platform. Hence, when players interact with the 3D models and change the structure, the texture (act as the message) map on top change as well. The animation clips are therefore cut and sliced into fragments along with the transformation of forms.

An array of video clips is created for the video player as you can see on the left and the animations I made using different software are then placed into it. Softwares such as After Effect and Clip Studio Paint are used to create the animation textures; they are produced in Minimalist style, which connects to my early brain-storming about simple shapes and structure.

Randomization is also applied in changing video clips while the shape is changing; it is to emphasize the idea of media transformation and highlight the research I made in my thesis. We have the control right to choose what to receive, but the chosen piece of information is already something designed and decided by others before presenting to us.

E V U L A T I O N



My piece express my concept of media transformation, where the cube is broken into 3 parts, and reforms in a more abstract way, representing information you used to know does not really present in the way you are familiar with. Forms of content can change, and the content itself varies too. Model of the cube is restructuring, as well as the material of the cube. Animation clips I made are generated randomly while players interact with the mouse and change the form. It is my first time using Unity3D as the platform to build an interactive piece, where lots of functions could be improved later on, the concept of this piece should remain, but the way players interact with should be perfected. Sounds are created using Medly (iPad app) which different kind of instruments can be chosen in making music piece. With feedback from the players, the switch of sounds can be smoother, and the trigger method can also be more user friendly. In future perfection, I should develop a way people can actually control each part of the model to form their combination; more engagement should be added to the game to build enjoyment, this piece could be more like a game instead of interacting with the least function within a digital installation.

It is a pity that my piece is not able to present directly on a webpage by building the project in WebGL format according to the video player bug in Unity. In the form of WebGL, the behaviour of my project could match to my thesis research in a better way. Thus to expand the 'mass media' concept from Marshall McLuhan where a large group of audience can access to my message, I, therefore, built the game in Windows platform and uploaded onto itch.io (https://muzitua.itch.io/cube) where my art-game can be spread and download via link.