



DigiSense

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Designer

ENT 4499 Culmination



Where It All Began

From the time I started thinking of an idea for a culmination project, I knew that I wanted to create an interactive experience, the important question became how can I create something that can potentially be cool and entertaining but also simple at the same time?

- First Iteration = Physical glove prototype with sensors attached
- Three.js Model
- Processing Integration
- Learned about Leapmotion + Unity integration



Inspirations

My Main Goal and Inspiration for this project was to create something that could bridge the gap between my interests in gaming and interactive experiences, at the same time be simple and fun to mess around with.

Most projects I have worked on / brainstormed for classes have been very sci fi and unrealistic

DigiSense is a bridge to that as well, my love for futuristic-like projects but can also show the potential for future uses in this kind of technology, the idea of the glove and sensors controlling a 3D model was an attempt at a star wars like design, almost force wielding

- Leapmotion Playground served as a reference point for this project, I wanted to create something similar



Budget / Expenses / Project Assets

- LeapMotion Controller (Sensor) = \$ 90
- Leapmotion SDK
- Leapmotion Interaction Manager
- Unity

Total = \$90

February

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
26	27	28	29	30	31	1
2	3 Aquiring Materials/ Software Familiarization	4 Aquiring Materials/ Software Familiarization	5 Aquiring Materials/ Software Familiarization	6 Aquiring Materials/ Software Familiarization	7 Aquiring Materials/ Software Familiarization	8 Aquiring Materials/ Software Familiarization
9 Aquiring Materials/ Software Familiarization	10 Digital Construction Of 3D Model	11 Digital Construction Of 3D Model	12 Digital Construction Of 3D Model	13 Digital Construction Of 3D Model	14 Digital Construction Of 3D Model	15 Digital Construction Of 3D Model
16 Digital Construction Of 3D Model	17 Digital Construction Of 3D Model	18 Digital Construction Of 3D Model	19 Digital Construction Of 3D Model	20 Digital Construction Of 3D Model	21 Digital Construction Of 3D Model	22 Digital Construction Of 3D Model
23 Digital Construction Of 3D Model	24 Programming/Integratio Of Motion Interaction with 3D model into Unity	25 Programming/Integratio Of Motion Interaction with 3D model into Unity	26 Programming/Integratio Of Motion Interaction with 3D model into Unity	27 Programming/Integratio Of Motion Interaction with 3D model into Unity	28 Programming/Integratio Of Motion Interaction with 3D model into Unity	29 Programming/Integratio Of Motion Interaction with 3D model into Unity

March

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30 Programming/Integratio Of Motion Interaction with 3D model into Unity	1 Programming/Integratio Of Motion Interaction with 3D model into Unity	2 Programming/Integratio Of Motion Interaction with 3D model into Unity	3 Programming/Integratio Of Motion Interaction with 3D model into Unity	4 Programming/Integratio Of Motion Interaction with 3D model into Unity	5 Programming/Integratio Of Motion Interaction with 3D model into Unity	6 Programming/Integratio Of Motion Interaction with 3D model into Unity
7 Programming/Integratio Of Motion Interaction with 3D model into Unity	8 Programming/Integratio Of Motion Interaction with 3D model into Unity	9 Programming/Integratio Of Motion Interaction with 3D model into Unity	10 Programming/Integratio Of Motion Interaction with 3D model into Unity	11 Programming/Integratio Of Motion Interaction with 3D model into Unity	12 Programming/Integratio Of Motion Interaction with 3D model into Unity	13 Programming/Integratio Of Motion Interaction with 3D model into Unity
14 Programming/Integratio Of Motion Interaction with 3D model into Unity	15 Programming/Integratio Of Motion Interaction with 3D model into Unity	16 Programming/Integratio Of Motion Interaction with 3D model into Unity	17 Programming/Integratio Of Motion Interaction with 3D model into Unity	18 Programming/Integratio Of Motion Interaction with 3D model into Unity	19 Programming/Integratio Of Motion Interaction with 3D model into Unity Alpha Test	20 Programming/Integratio Of Motion Interaction with 3D model into Unity
21 Programming/Integratio Of Motion Interaction with 3D model into Unity	22 3D Model Animations Based On User Motions	23 3D Model Animations Based On User Motions	24 3D Model Animations Based On User Motions	25 3D Model Animations Based On User Motions	26 3D Model Animations Based On User Motions	27 3D Model Animations Based On User Motions
28 3D Model Animations Based On User Motions	29 3D Model Animations Based On User Motions	30 3D Model Animations Based On User Motions	31 3D Model Animations Based On User Motions	1 3D Model Animations Based On User Motions	2 3D Model Animations Based On User Motions	3 3D Model Animations Based On User Motions

April

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28 3D Model Animations Based On User Motions	29 3D Model Animations Based On User Motions	30 3D Model Animations Based On User Motions	31 3D Model Animations Based On User Motions	1 3D Model Animations Based On User Motions	2 3D Model Animations Based On User Motions	3 3D Model Animations Based On User Motions
4 Testing/Debugging	5 Testing/Debugging	6 Testing/Debugging	7 Testing/Debugging	8 Testing/Debugging	9 Testing/Debugging Beta Test With Other Users	10 Testing/Debugging
11 Testing/Debugging	12 Testing/Debugging	13 Testing/Debugging	14 Testing/Debugging	15 Testing/Debugging	16 Testing/Debugging	17 Testing/Debugging
18 Testing/Debugging	19 Testing/Debugging	20 Testing/Debugging	21 Testing/Debugging	22 Testing/Debugging	23 Testing/Debugging	24 Testing/Debugging
25 Testing/Debugging	26 Testing/Debugging	27 Testing/Debugging	28 Testing/Debugging	29 Testing/Debugging	30 Testing/Debugging	1



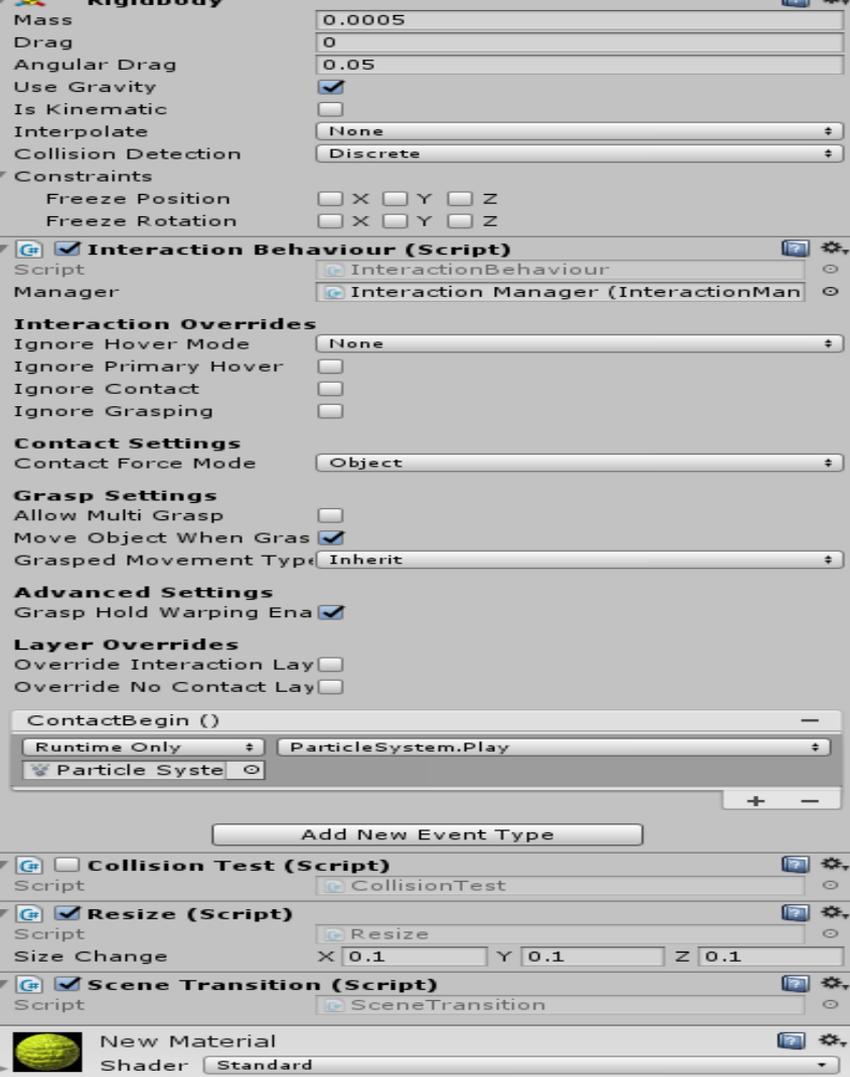
07:00

touch_ and right_ was detected: disabling controller object. Please check the device string if this was an error.

touch_ and right_ was detected: disabling controller object. Please check the device string if this was an error.

touch_ and left_ was detected: disabling controller object. Please check the device string if this was an error.

touch_ and left_ was detected: disabling controller object. Please check the device string if this was an error.



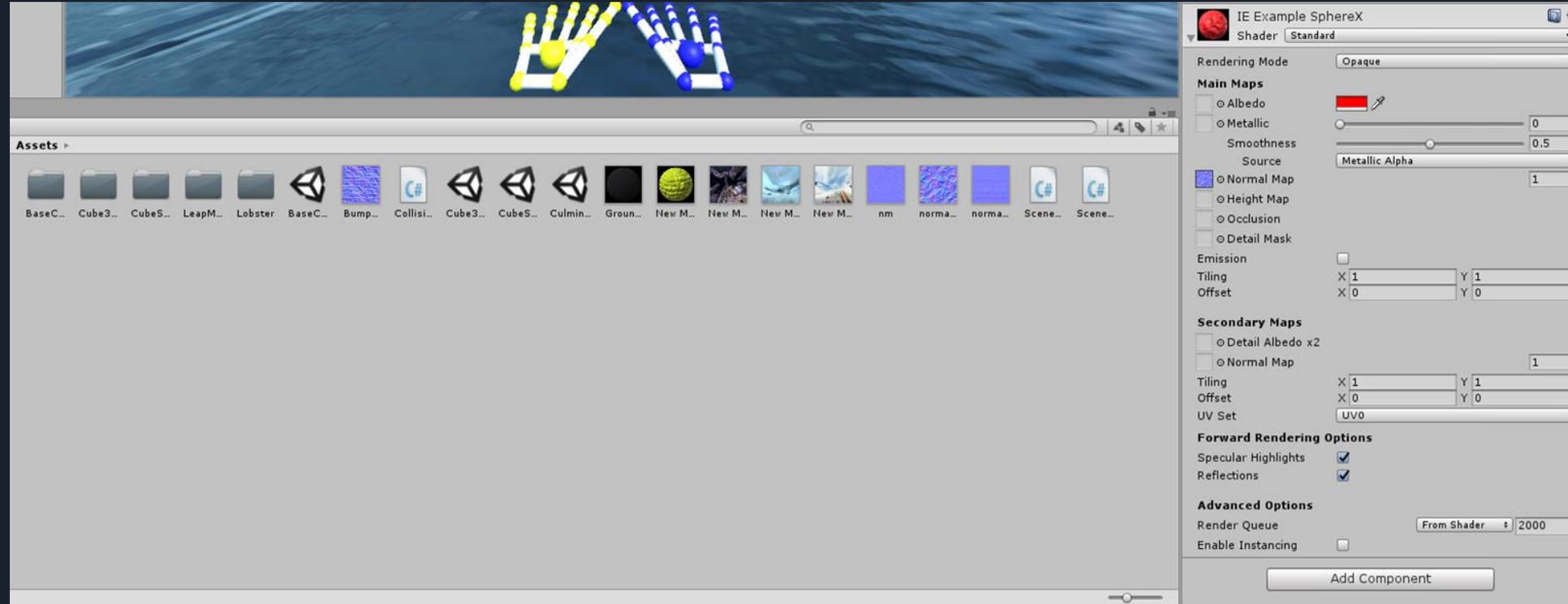
Technical

Interaction Cube Inspector

- Interaction Behavior event type used to control particle system, activates on first contact

Normal Mapping Textures

(To give more realism to textures)





Issues and Complications

- Incompatible versions of Leapmotion assets and unity
- Scripts and Coding (resizing models on touch)
- Sensor Calibrations
- Screen Bounds for interactions
- Hardware Limitations (Laptop Used)
- Lack of Port for projector
- Project build - School Computers



Development

- Started With basic scene with resize script
- Visual Designing went well, not hard to figure out / prior experience

- Learn interactions within unity
- More familiarity with unity
- (normal mapping, camera lock, interaction management)



touch_ and right_ was detected. disabling controller object. Please check the device string if this was an error.
controller_ and right_ was detected. disabling controller object. Please check the device string if this was an error.
controller_ and left_ was detected. disabling controller object. Please check the device string if this was an error.
touch_ and left_ was detected. disabling controller object. Please check the device string if this was an error.
touch_ and controller was detected. disabling controller object. Please check the device string if this was an error.

Simple Scene Transition Script

```
1 using UnityEngine;
2 using System.Collections;
3
4 public class SceneTransition2 : MonoBehaviour
5 {
6
7     void Update()
8     {
9         if (Input.GetKeyDown(KeyCode.E))
10        {
11            Application.LoadLevel("Cube3Container");
12        }
13    }
14 }
```



button , and right' was detected: disabling controller input. Please check the device string if this was an error.

controller , and right' was detected: disabling controller input. Please check the device string if this was an error.

controller , and left' was detected: disabling controller input. Please check the device string if this was an error.

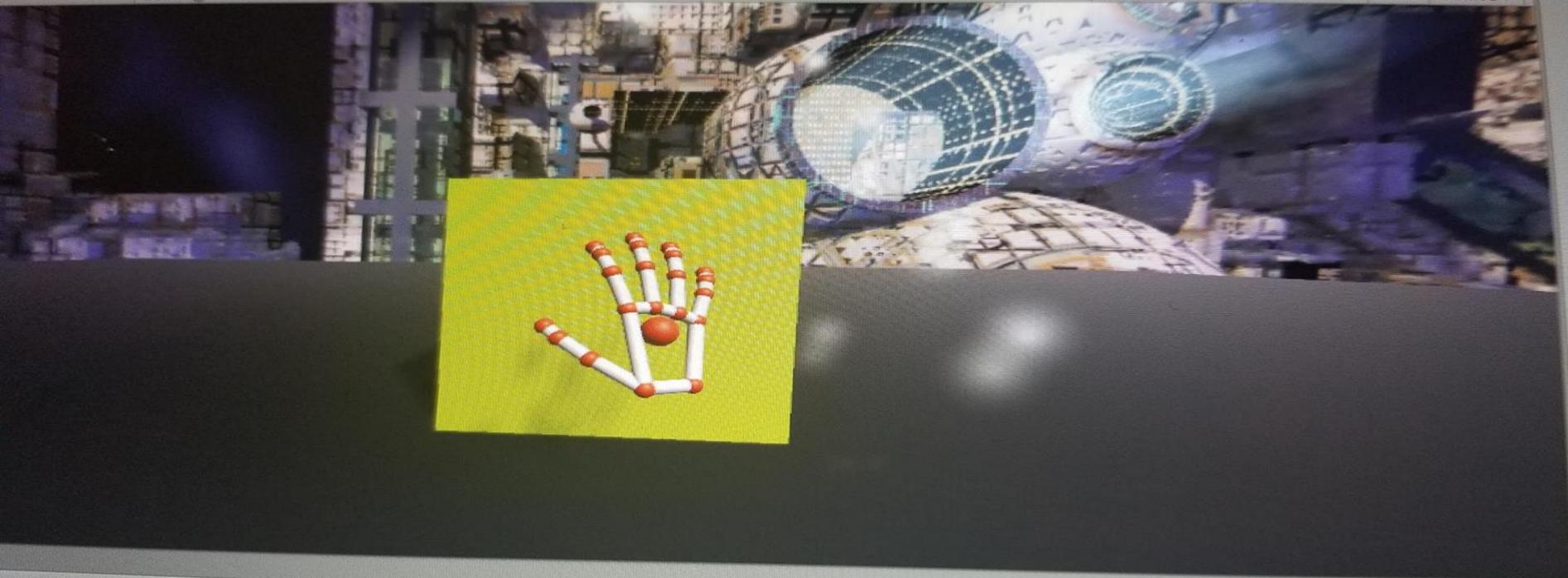
button , and left' was detected: disabling controller input. Please check the device string if this was an error.



Asset Store

Scale 1x

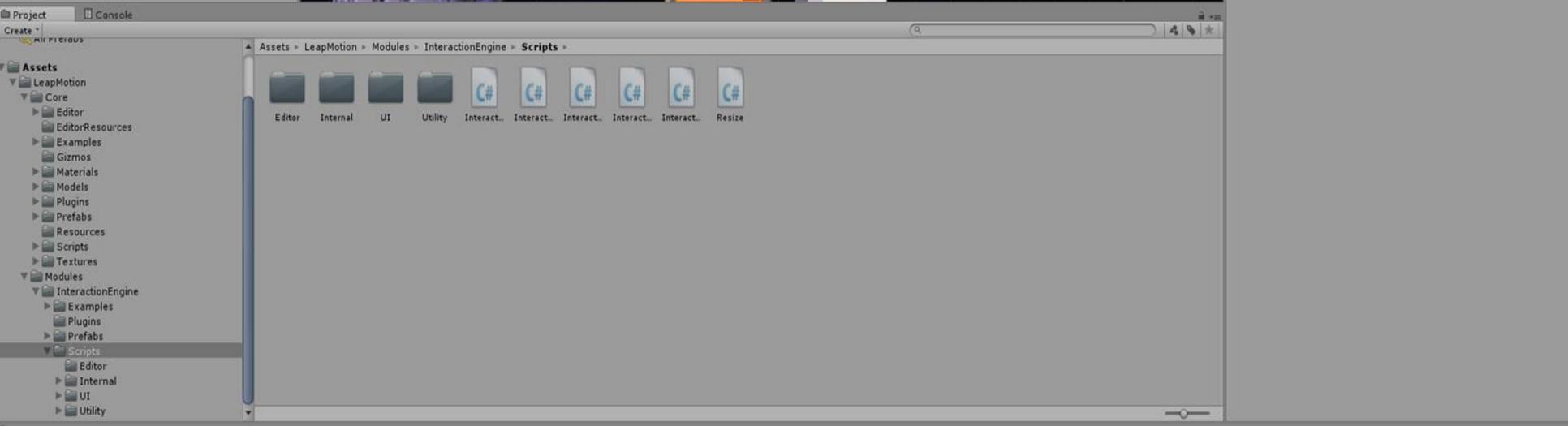
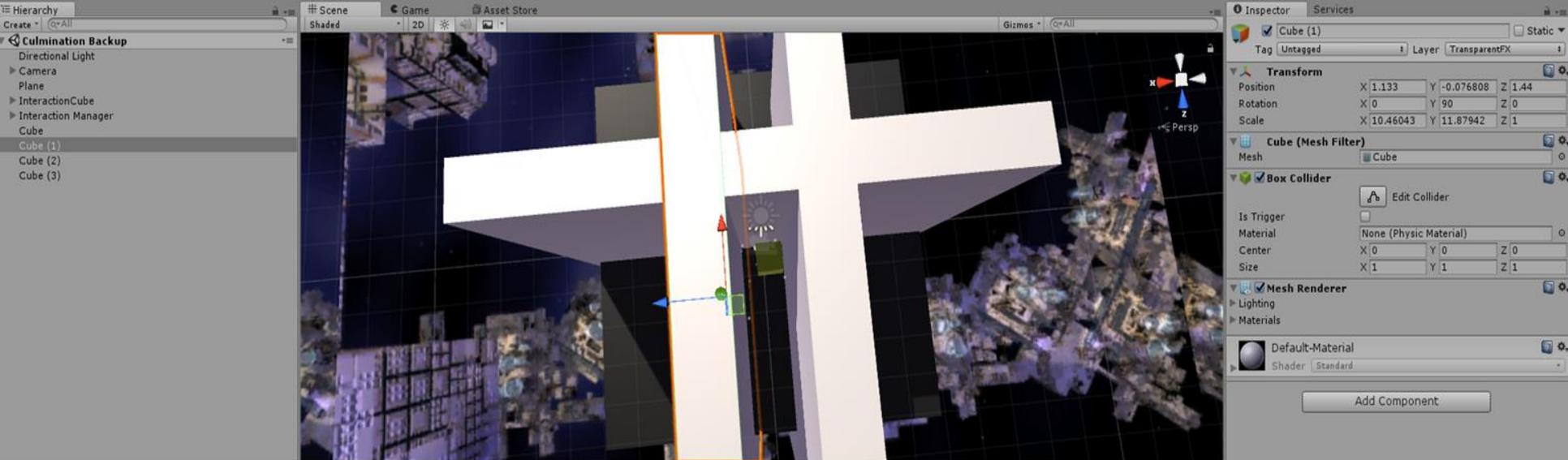
Maximize On Play Mute Audio Stats Gizmos



Engine > Scripts >

- Script 1 (C#)
- Interact... (C#)







The Final Product

In the end what we have is a user experience that allows other people to see the creative power and potential of Leapmotion technology, it can expose other students and professors to possibly want to work with this in the future for some classes. A big surprise was discovering that City Tech actually has some of these around, because I had never seen or heard of this before.

- What Would I Change / Do Differently?

Add more effects / add some audio effects

More interactions

Better Visuals



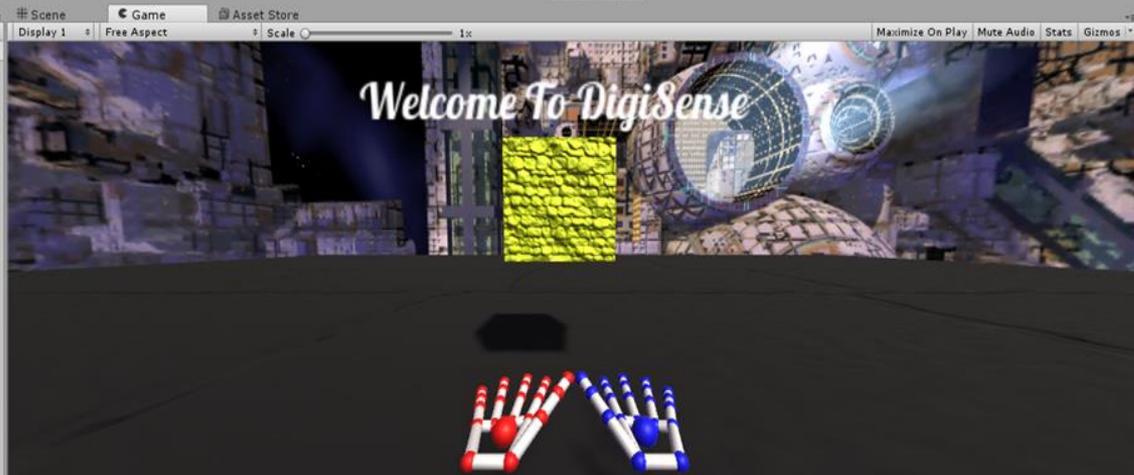
How this project made me better / helped me learn along the way

- DigiSense helped me in so many ways, to grow not only as a programmer and developer but also as a person and professional
- Coding
- Confidence
- Debugger
- Unity Knowledge
- Creative Problem Solving
- Visual Design
- **Patience! (And So Much More)**

Hierarchy

Create

- BaseCubeResize
 - Directional Light
 - Camera
 - Floor
 - InteractionCube
 - Interaction Manager
 - Invis Wall (1)
 - Invis Wall (2)
 - Invis Wall (3)
 - Invis Wall (4)
 - Welcome Text



Inspector

Scene Global maps Object maps

Source: Skybox

Intensity Multiplier: 1

Ambient Mode: Realtime

Environment Reflections

Source: Skybox

Resolution: 128

Compression: Auto

Intensity Multiplier: 1

Bounces: 1

Realtime Lighting

Realtime Global Illuminatic:

Mixed Lighting

Baked Global Illumination:

Lighting Mode: Subtractive

Mixed lights provide baked direct and indirect lighting for static objects. Dynamic objects receive realtime direct lighting and cast shadows on static objects using the main directional light in the scene.

Realtime Shadow Color: [Color Picker]

Project

Console

Favorites

- All Materials
- All Models
- All Prefabs

Assets

- BaseCubeResize
- Cube3Container
- CubeStack
- LeapMotion
 - Core
 - Editor
 - EditorResources
 - Examples
 - Gizmos
 - Materials
 - Models
 - Plugins
 - Prefabs
 - Resources
 - Scripts
 - Algorithms
 - Animation
 - Attachments
 - Attributes
 - DataStructures
 - DetectionUtilities
 - Hands
 - Query

Assets

BaseC... Cube3... Cube5... LeapM... Lobster BaseC... Bump... Collis... Cube3... Cube5... Culmin... Groun... New M... New M... New M... New M... nm norma... norma... Scene... Scene...

Lightmapping Settings

Lightmapper: Enlighten

Indirect Resolution: 2 texels per unit

Lightmap Resolution: 40 texels per unit

Lightmap Padding: 2 texels

Lightmap Size: 1024

Compress Lightmaps:

Ambient Occlusion:

Final Gather:

Directional Mode: Directional

Directional lightmaps cannot be decoded on SM2.0 hardware nor when using GLES2.0. They will fallback to Non-Directional lightmaps.

Indirect Intensity: 1

Albedo Boost: 1

Lightmap Parameters: Default-Medium

Other Settings

Fog:

Halo Texture: None (Texture 2D)

Halo Strength: 0.5

Flare Fade Speed: 3

Flare Strength: 1

Spot Cookie: Soft

Debug Settings

Auto Generate

0 non-directional lightmaps 0 B No Lightmaps

