**Unity overview:**

-Unity project Folder

-In the “Assets” folder Scene “Gesture\_Detection\_testV01” is the scene that tests all the functions.

-Objects in the scene

-Main Camera

-Directional Light

-Female\_Torso\_Texture\_2: contains the prefab “Female\_Torso”. This object use male textures. By default when the program starts up the Shader of this object’s “Transparency” is set to 0, which means this object is invisible.

-Kinect: This object contains objects that set up Unity to connect Kinect hardware

-Female\_Torso\_Texture\_1: contains exact same thing as “Female\_Torso\_Texture\_2” except it uses female texture, and when the program starts up its Shader’s “Transparency” is set to 1.

-Detect: contains scripts that controls the program using data from Kinect

-EventSystem: Unity generated object

In order to achieve the functionality of model morphing between male torso and female torso, I created a model with blendshape in Maya so that the geometry can switch between male and female versions. However, Unity doesn’t allow one object to have two Shader, and each Shader can only have one texture map. I created two objects with identical models but different Shaders with different textures, and switching the transparency of the two Shaders while switching the blendshape values of the two sets of models achieve the visual effect that the male torso is transforming into female torso.

Default state (Female State):

-Transparency value of “Female\_Torso\_Texture\_2” is set to “0”. Male texture invisible.

-Blendshape value of “Female\_Torso\_Texture\_2” is set to “0”. 0 value is the female state.

-Transparency value of “Female\_Torso\_Texture\_1” is set to “1”. Female texture visible.

-Blendshape value of “Female\_Torso\_Texture\_1” is set to “0”. 0 value is the female state.

Female morphing into Male:

-Transparency value of “Female\_Torso\_Texture\_2” goes to “1” from “0”. Invisible to visible.

-Blendshape value of “Female\_Torso\_Texture\_2” goes to “100” from “0”. 100 is the male state.

-Transparency value of “Female\_Torso\_Texture\_1” goes to “0” from “1”. Visible to invisible.

-Blendshape value of “Female\_Torso\_Texture\_1” goes to “100” from “0”. 100 is the male state.

Male State:

-Transparency value of “Female\_Torso\_Texture\_2” is “1”. Male texture visible.

-Blendshape value of “Female\_Torso\_Texture\_2” is “100”. 100 is the male state.

-Transparency value of “Female\_Torso\_Texture\_1” is “0”. Female texture invisible.

-Blendshape value of “Female\_Torso\_Texture\_1” is “100”. 100 is the male state.

Male morphing into Female:

-Transparency value of “Female\_Torso\_Texture\_2” goes to “0” from “1”. Visible to invisible.

-Blendshape value of “Female\_Torso\_Texture\_2” goes to “0” from “100”. 0 is the female state.

-Transparency value of “Female\_Torso\_Texture\_1” goes to “1” from “0”. Invisible to visible.

-Blendshape value of “Female\_Torso\_Texture\_1” goes to “0” from “100”. 0 is the female state.

**C# Scripts overview:**

PhaseChange.cs:

-Variables are accessed by KinectManage.cs

-Determine the Phase of the program

-For example: “Waving hand” (a gesture recognized by Kinect) can trigger different responses when the program is in different Phases

Transformation.cs

-Gather data from PhaseChange.cs and stream data to DoubleSideShaderMorph.cs and DoubleSideShaderMorph1.cs

-Determine whether the Kinect is recognizing male gesture or female gesture, and trigger different events based on different phases the program is at

DoubleSideShaderMorph & DoubleSideShaderMorph1

-The two scripts are assigned to the models in the scene to alter the models’ blendshape value and transparency value.

-DoubleSideShaderMorph is assigned to object Female\_Torso\_Texture\_1’s “FemaleLower” and “FemaleUpper”

-DoubleSideShaderMorph1 is slightly changed script from DoubleSideShaderMorph which is assigned to object Female\_Torso\_Texture\_2’s “FemaleLower” and “FemaleUpper”

- Female\_Torso\_Texture\_1’s shader is assigned with female version texture

- Female\_Torso\_Texture\_2’s shader is assigned with male version texture

DetectPresense.cs

-The method to detect the presence of people is to look for feedback from Kinect radar camera. If it register a skeleton in front of the camera, then presence is true.

-This script is applied to gameobject “Kinect” in Unity

ZoneReaction.cs

-The function of this script is to play different animation while Kinect detecting different gestures

**Other download contents:**

-Unity project folder

-Assets

-Double Sided Shaders

These Shader files were downloaded from Unity assets store because Unity’s default Shaders does not support rendering double side of a mesh, meaning that the inside of the mesh is not shown.

“Double Sided Shaders” created by Shaders Ciconia Studio

<https://www.assetstore.unity3d.com/en/#!/content/23087>

-Assets

-KinectView

-Scipts

-BodiSourceManager.cs

This is a script comes from Kinect SDK package, it is not modified and it is applied to gamobject “BodySourceManager” in Unity