Mixed Reality Feature Toolkit

1. Start a new 3D project in Unity
2. For the first time into the new Unity project, you will see the menu below. Enter the values below starting with Universal Windows Platform. See below for the other setting. X out of the menu.
3. To switch the platform after starting the new project, use File > Build Settings to open the menu and then enter the values below. X out.

Graphical user interface, text

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Navigate to the following to download the MRFT

<https://www.microsoft.com/en-us/download/details.aspx?id=102778>

MUCH LATER (NEED MORE INFO HERE)

1. When opening the Unity project with MRTK configured, the following window opens in parallel with the Unity IDE.

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1. Stretch out the above window to see the other selections as shown below.

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1. Build Settings>Player Settings>XRPlugInManagement. You see the following menu. Select “OpenXR” and “Microsoft HoloLens Feature Group”. Clicking the Yellow Triangle gets the list of Issues. Click Fix-All. There is one that remains – “At least one interactive profile must be added”.

Graphical user interface, text, application

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1. Drill down into the “OpenXR” menu on the lower left. You see the following menu. Select Single Pass Instance and Depth 16 Bit. The Hand Tracking and Motion Controller Model was already selected.

**Graphical user interface, text

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1. Press X to drop out of the above window.
2. Back to MRTK Configurator, press Apply Settings.

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1. Press Next on MRTK Configurator. Again make sure the window is large enough to see all the configurations.

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1. Click Apply. Unity will restart
2. Importing TextMeshPro. Click “Window” on top menu, TextMeshPro, Import TMP Essential Resources. Review the items to import and click “Import”

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1. Add MRTK to Scene using “Mixed Reality” on toolbar, Toolkit>Add to Scene and Configure

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This has added a list of items to scene

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1. Save Scene
2. Enable Spatial Awareness, select Mixed Reality Toolkit

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1. Select Spatial Awareness on Lower Right, Click the Spatial Awareness. Note that my Unity already had this checked and I couldn’t unchecked. Use the “Copy & Customize” to Clone the profile to make my own changes.

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1. I need to Clone the default settings a few times, it doesn’t appear to make much sense but this is how it was described by Sean Ong. After a few times, the settings were editable as shown below.

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Auto Start is left. 3.5 update interval, is how often the HoloLens will scan the environment. Improve performance by scanning less, 10 secs or 30 seconds.

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Observation extents is 3 meters by 3 meters by 3 meters. This can be changed to larger or smaller. Also “Coarse” level of detail helps performance by leaving it set to coarse. Lastly, the Display option can be changed from visible to occlusion. There are other great effects using shaders. All these setting should be played with.

Graphical user interface

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Special Note: build a collection of these profiles so I don’t need to keep editing them every time.

IMPORT CUSTOM PACKAGE

1. Assets>Import Package>Custom Package. I downloaded the package “MixedRealityCookingExperince-Week2” and placed in the Week2\_CustomPackage folder in the HololensXRCourse. Clicking on the package immediately opened the import window so I didn’t need to select Asset>…
2. The package shows up in the Assets list.

Graphical user interface, application

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1. Drag the Prefab>Main Canvas to the hierarchy. Show the “Game” screen to see the simple UI.

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1. Add an empty game object, rename to UI Manager and add component Scene UI Manager. The Scene UI Manager is a custom script that Sean Ong developed to manage the various UI panel. Edit this script in Visual Studio to see the various comments. Back to UIMananger, drag items from under the MainCanvas over to the UIManager variables – six of them with the same name in both places (note: expand the arrows to drill down into the Hierarchy). For example, Main Page from Hierarchy over to Main Page on the left under Scene UI Manager. Continue with the others.
2. Add hand Interaction, on Hierarchy, on Main Page, Add Components then add the following three components. These will show up as Object Manipulator, NearInteractionGrabble and BoundsControl. Note, when Object Manipulator is added, the Constraint Manager also appears before it.
3. With BoundsControl, slide MainPage over to the BoundsOverride (under BoundsControl)
4. Hierarchy>drill down MainPage to find StartButton and Add Component “Interactable”, expand Interactable and press the + under List is Empty and drag over UI manager to the Runtime Only. Change the Function to SceneUIManager.LoadMainPage (Note: Sean’s video shows LoadMainMenu but I do not see that selection). Below shows the comparison between the two selections.

|  |  |
| --- | --- |
| Sean Video | My Selection |
|  |  |

1. Continue with Start Button and add another component>NearInteractableTouchable. Click on FixBounds to correct the yellow triangle. Also Fix Center.
2. Expand Receivers and select Add Event. Under “EventReceiverType” pulldown and select InteractableOnTouchReceiver. On the Event properties, add an event using the “+”. Now, from the hierarchy, pull over the UI Manager into the Event Properties and using the right-hand pulldown, select SceneUIManager.LoadMainPage.

TEST SCENE IN UNITY EDITOR

1. To make the background black as it would be transparent in the HoloLens, find the Main Camera in the Hierarchy, select ClearFlags as Solid Color and choose a black color. UPDATE: This did not work, I needed to Edit the MixedRealityToolBox and select Camera, Clone the profile, then I can edit the Display settings from Skybox to Solid Color, Black.
2. Run the game and press the shift key to show a Hand. Move the mouse to move around the hand. Use ASDW, arrow keys, mouse wheel, Q E. MRTK documentation has a complete list of commands.

Also, W2.L07 and L08 are swapped.

CONFIGURE SPEECH COMMANDS

1. Hierarchy>MixedRealityToolkits> Input and Close the profile. I changed the profile name to Mike1\_Mixed…. As shown below. And press Clone.

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1. Go down to Speech and clone that with the same name as above but I think that the name could be anything.
2. Add a new speed command, Setup Mode. And another Recipe Mode.
3. Hierarchy>SetupMode. Add a component, SpeechInputHandler. Uncheck IsFocus Required so we do not have to gaze at it. Next, click on the “+” to add Element 0, expand this item, and scroll down the Speech Command to find Setup Mode as shown below.

Graphical user interface, text, application

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1. Add a “+” and pull across UIManager (from hierarchy) and pulldown > SceneUIManager>StartSetupMode()

Graphical user interface, text, application

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1. Repeat the above process to add another Speech Command for Recipe Mode so when I say Recipe Mode, it will start the recipe mode function. Begin with Hierarchy> Recipe Mode. Add Component>SpeechInputHandler. Uncheck InFocus, + Foe element 0, Speech Command>Recipe mode. + Response, Pull over UIManager, Select SceneUIManager> pull down Recipe Mode

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CONFIGURE EYE TRACKING

1. Hierarchy>MixedRealtiyToolkit, Go to Input>Pointers (expand arrow), and clone Profile Name. I used here Mike1\_Mixed…
2. Check “IsEyeTracking” so it is enabled. Collaspe this down
3. Go to Input Data Providers>Input Simulation Service> Clone this. Go down to Eye Gaze Simulation and set to Camera Forward Axis.
4. Now to get the eye tracking to fully work, there is another setting that needs to be configured. Go to Build Settings>Player Settings>OpenXR then click the “+” to add Eye Gaze Interaction Profile. The X-out to close the Build windows.
5. Hierarchy>Main Canvas>Mode Page>Setup Mode, then on the right, add a component “EyeTrackingTarget” that makes this page an eye target. Examine all the different options. For example, the check box for “Eye Cursor Snap to Target Center” is useful if there are many buttons and you can snap around the different selections.
6. Go to While Looking at Target, “+”, Drag over UIManager, and add the following:

Graphical user interface, application

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1. Do the same for On Look Away to show the following, so that when you look aways the menu will disappear.

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1. Do the same as above for Recipe Mode using add component>EyeTrackingTarget, While Looking… EnableEyeTrackingRecipeMode and then Disable Eye Tracking for “On Look Away”

TEST ON HOLOLENS 2

1. Go to Build Settings and Build – select a target directory. I created a new folder “Build” in the same folder as Assets.
2. A Windows File Explorer will open and drill down to Build and select the “.sln” file to launch Visual Studio.
3. In VS, select Release, ARM64, Debug>Start without Debugging. Make sure the HoloLens is on and I’m logged in. If this is the first time running the file, go to the Project>Properties>Debugging>Machine name and select the HoloLens as shown below:

Graphical user interface, text, application

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1. If all is well, the file will be downloaded to the HoloLens