CMP3754M Virtual and Augmented Reality

Workshop 11 : UI and Object Control

Objectives:

1. Add UI components
2. Adapt touch controls to create and highlight objects
3. Use UI components to manipulate objects

Duration: 1 hour
Platform: *Unity 6 (version = 6000.0.59f1 LTS)*

By completing this workshop you will build functionality that you can use to complete your second assessment for this module

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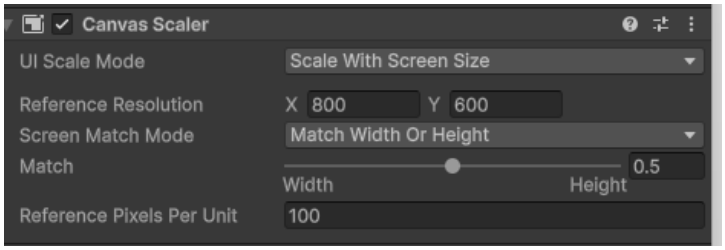
1. Introduction

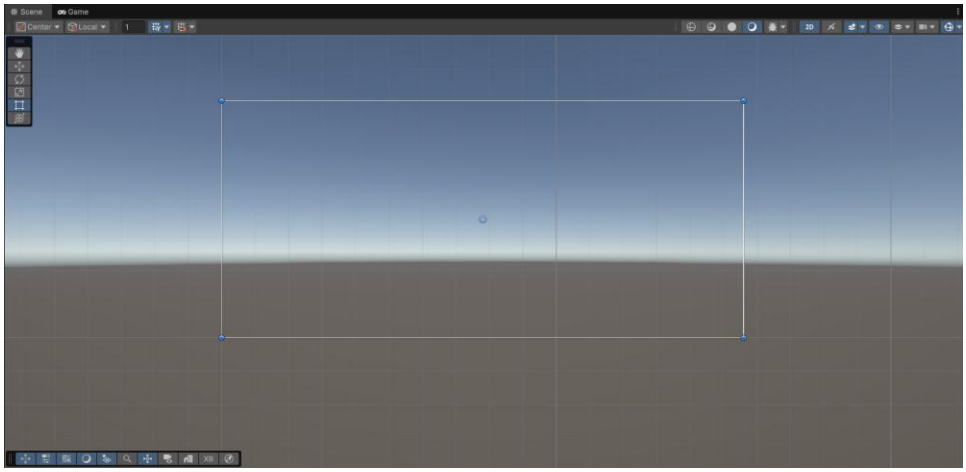
In this workshop you will extend the cube creation/deletion using some UI controls (buttons). This will involve creating and designing the UI elements, and also adapting our existing script for creating cubes on a plane.

2. Create the UI Elements

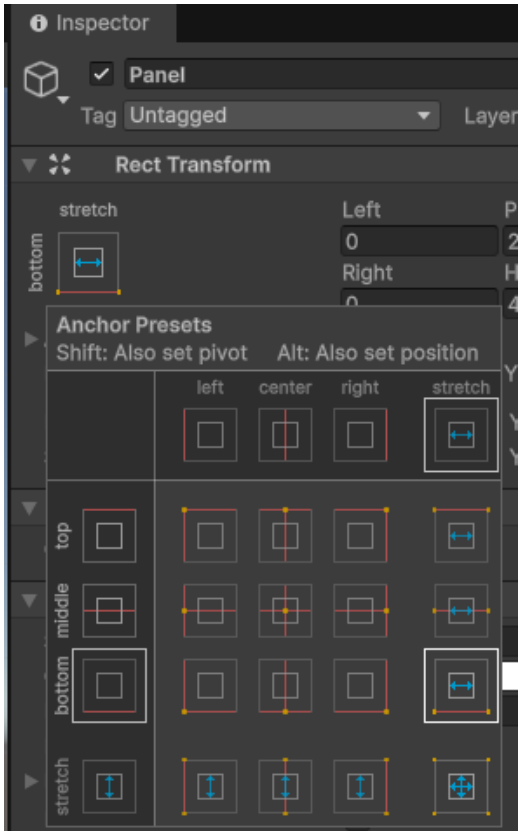
In the Hierarchy, right click and select **UI > Canvas** to create a Canvas object. This is the base object for your UI. In the inspector, change the **UI Scale Mode** to **Scale With Screen Size**, and **Match** to 0.5.



Switch into 2D editing mode by clicking the small 2D button at the top of the Scene view window. If you zoom out (quite a long way) using the mouse wheel, you should see the blank canvas as a rectangular outline in the Scene view:



Right-click on the Canvas object in the Hierarchy, and select **UI > Panel**. With the panel selected, click on the Anchor Preset in the top left of the Rect Transform component in the inspector, and select **Bottom/Stretch**:

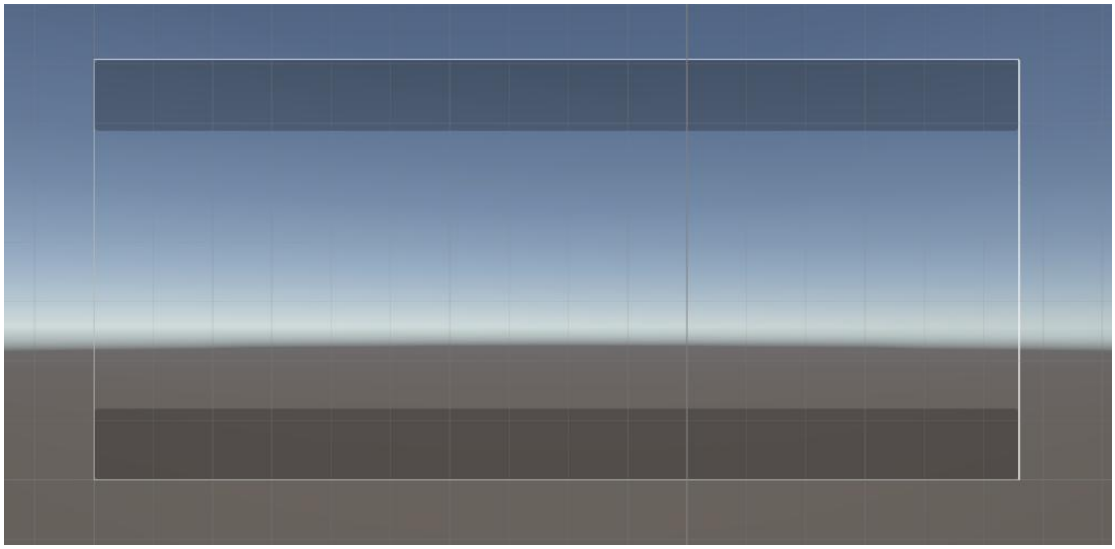


Then, staying in the Rect Transform component, set the Y Position to 40, and the height to 80.

In the Image component, set the colour to be a dark grey or black, with about 50% transparency.

Finally, add a Horizontal Layout Group component to the panel. **Change the Child Alignment** field in the Horizontal Layout Group component to **Middle Centre**.

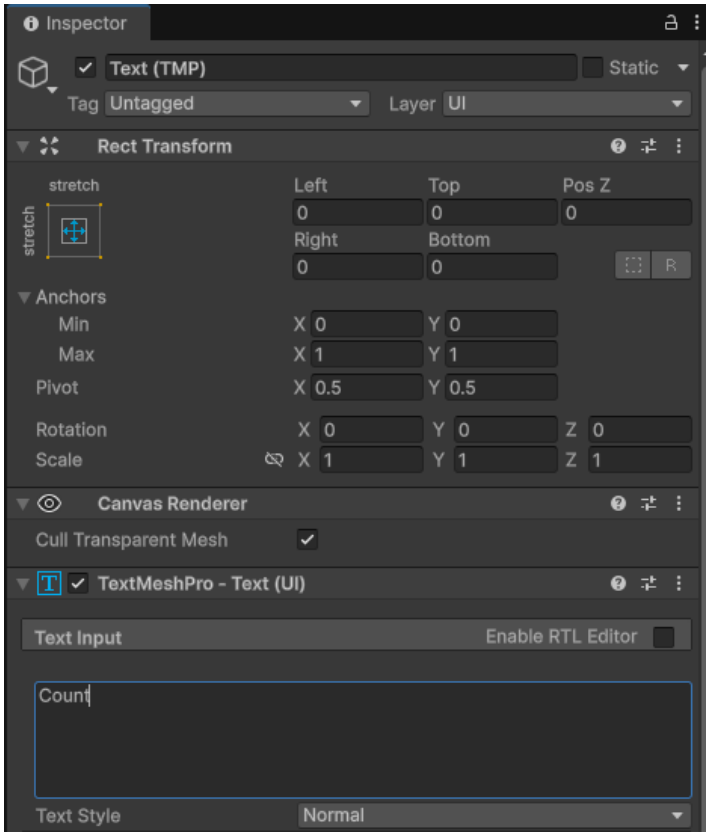
Duplicate the panel, and set the Anchor Preset of the duplicate to Top/Stretch, and the position to -40. The Canvas should now look like this in the scene view:



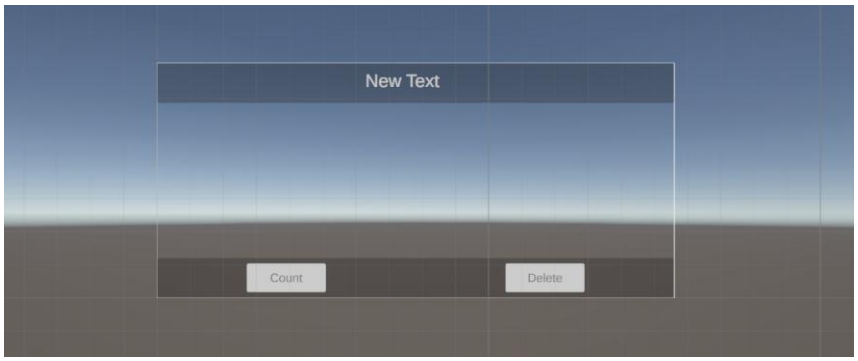
You can test this on your phone if you like. Note that the panels block the user from clicking on the detected planes, or created objects.

Next, we will add buttons to the bottom panel. Right-click on the panel in the Hierarchy, and select **UI > Button – TextMesh Pro**. At this point a dialogue should appear and ask if you want to import TextMesh Pro. Select **Import TMP Essentials**. You don't need to import the Extras and Samples. Close the dialogue.

You should now see a button on the panel. Change its height to 60. Click on the Text TMP object which is a child of the Button, and change the displayed text to "Count" in the TextMeshPro – Text(UI) component. Highlight the Button object again, and duplicate it to create a second button as a child of the panel. Change the text for this button to "Delete".



Right click on the top panel in the Hierarchy, and add a child object of type “Text - TextMeshPro”. Set the alignment to be centre justified. Your UI should now look like this:



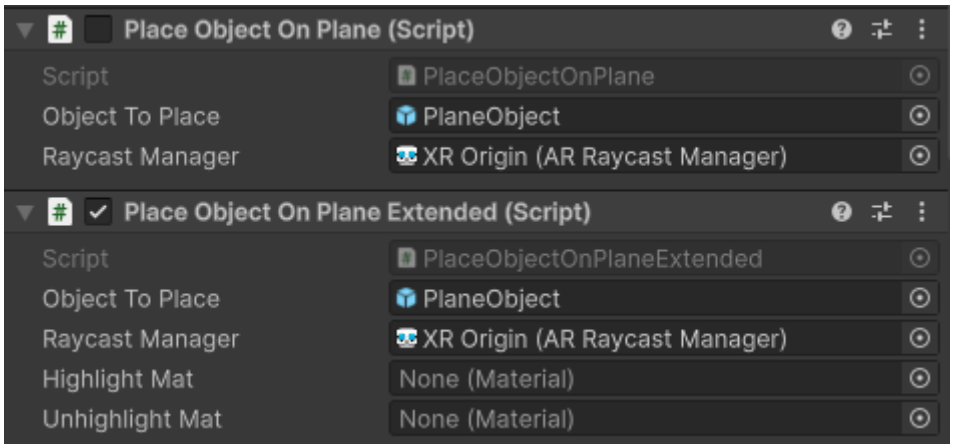
The buttons don’t yet do anything, but they should visibly respond to touch interactions. Test the layout on your phone, if you like.

3. Add Object Control Functions

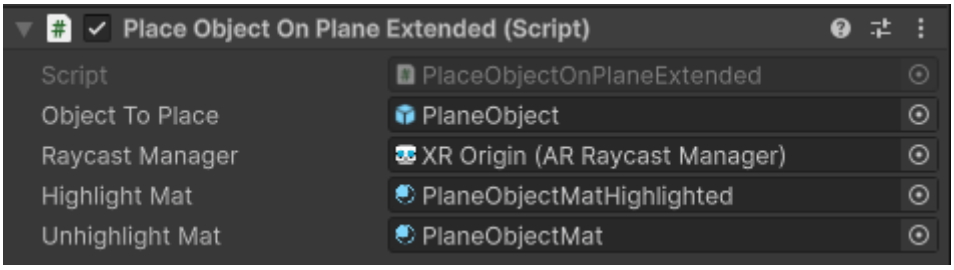
We will now modify our PlaceObjectOnPlane.cs script so that instead of deleting an existing object when you touch it, the object now gets highlighted. The current highlighted object can either be deleted using a separate function call, or queried for a value.

I have provided a new version of this Script called **PlaceObjectOnPlaneExtended.cs** download this script and place it in the **Assets>CMP3754>Planes** folder.

Select the XR Origin object in the Hierarchy, and disable the existing PlaceObjectOnPlane script. Then add the new PlaceObjectOnPlaneExtended script. Setup the **Object To Place** and **Raycast Manager** fields as for the original version of the script:



From the **Assets>CMP3754>Planes** folder, drag the PlaneObjectMat material into the **Unhighlight Mat** field. Duplicate the PlaneObjectMat material, and change the colour to something different (suggest: light blue). Rename it as PlaneObjectMatHighlighted. Drag the new material on to the Highlight Mat field in the PlaceObjectOnPlaneExtended script on XR Origin:



Test on the phone. You should find that touching an existing cube object highlights it, rather than deleting it. You can highlight any single object, but only have a maximum of one highlighted at a time. If you touch the highlighted object, it is unhighlighted.

Inspect the code, and make sure you understand how it works!

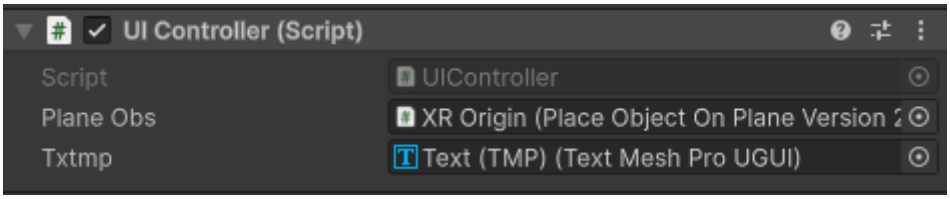
4. Connecting the Buttons

All that remains is to connect the buttons with the new functions in the PlaceObjectOnPlaneExtended script, and update the text on the top panel.

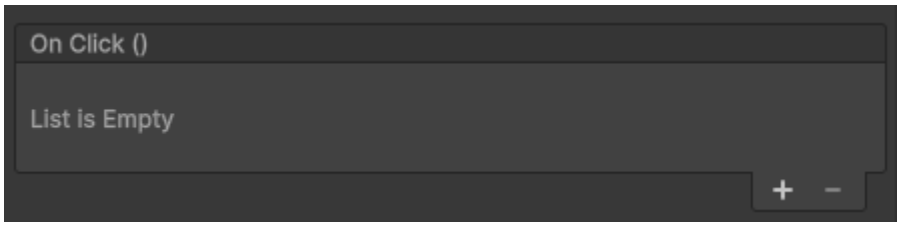
Create a new directory **Assets>CMP3754>UI**. Download the provided script **UIController.cs**, and put it in the new folder.

Familiarise yourself with the script.

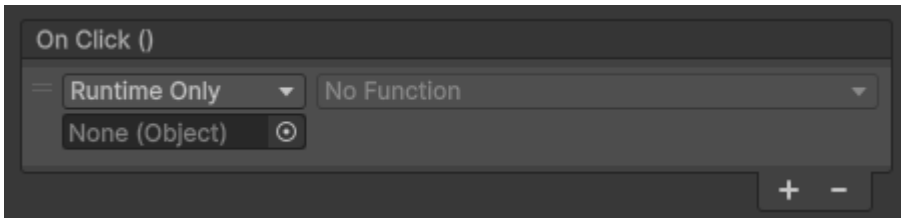
Add the UIController to the Canvas object. Drag the XR Origin object onto the Plane Obs field (to connect this script with the PlaceObjectOnPlaneExtended script), and drag the Text object which is a child of the top panel into the Txtmp field.



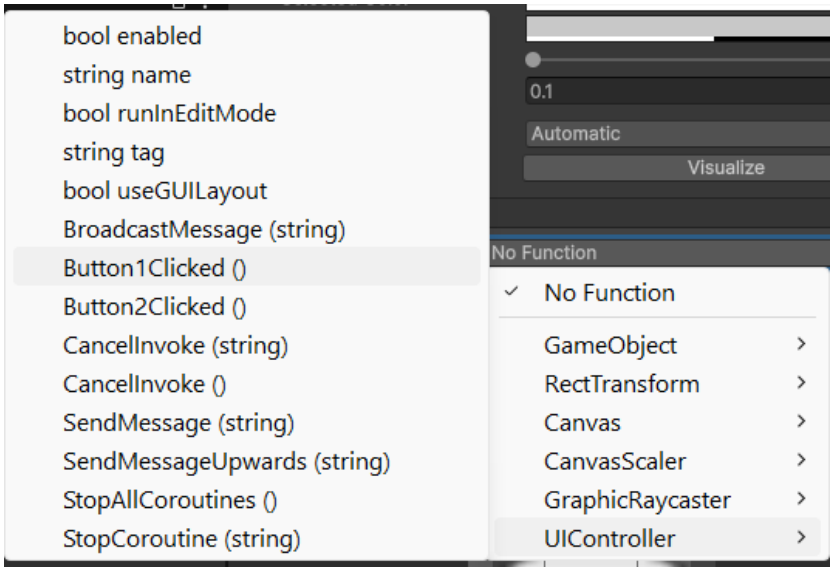
Finally, we can add the function calls to the UI button press events. Highlight the Count button in the Hierarchy, and find the OnClick() panel in the inspector:



Click the + button to add a function call:



Drag the Canvas object onto the None (Object) field. Then click in the fiedl that says “No Function”, and select the **UI Controller > Button1 Clicked** function:



Use the same procedure to add the **UI Controller > Button2 Clicked** function to the Delete button's OnClick function list.

That should be it: test what you have on your phone. You should find that the Delete button can be used to delete the currently highlighted object. Clicking the Count button should retrieve a number from the PlaceObjectOnPlaneExtended script and write it into the text on the top panel.

5. Conclusion

You now know how to detect markers, and planes. How to spawn objects on planes using touch inputs, and how to manipulate objects using UI controls. You can use/adapt your completed workshop tasks, and the provided scripts, to complete your assignment.