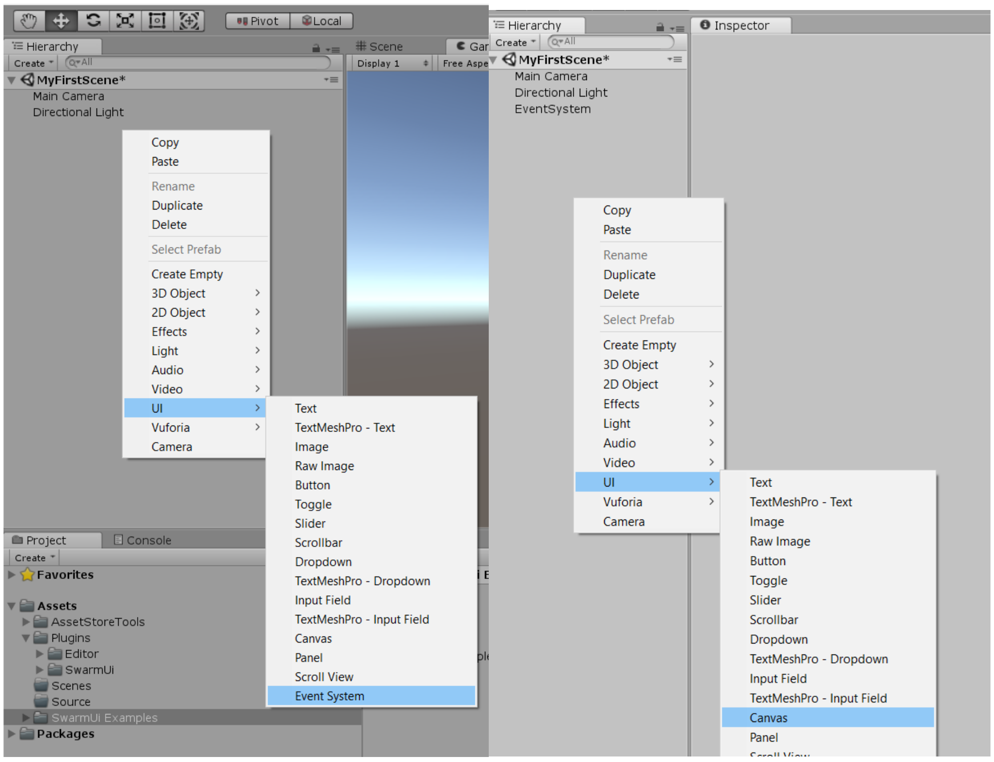
Swarm UI How-to

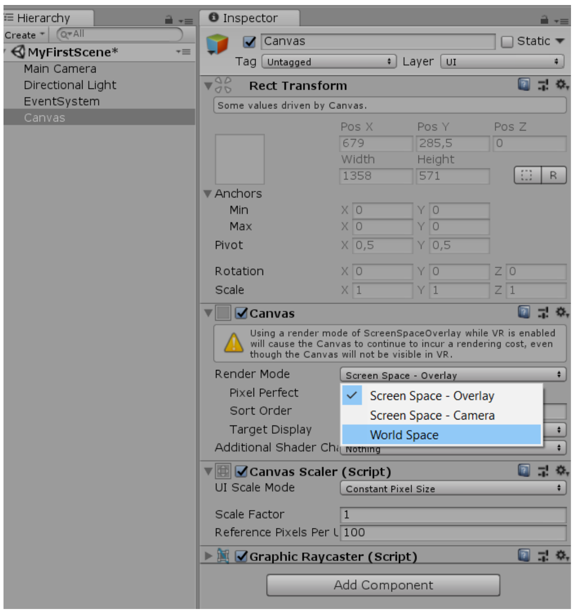
Contents

Setting up first scene

Start by adding an Event System and add a Canvas which is the root element of the SwarmUI



Set the camera of the canvas to world space



Canvas
Tag Untagged Layer UI

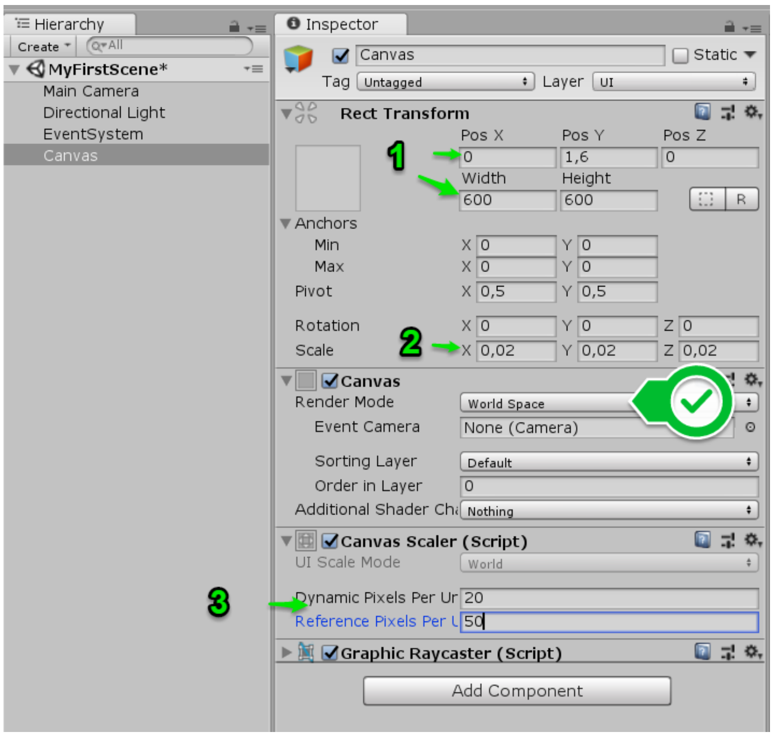
Rect Transform
Some values driven by Canvas.
Pos X 679 Pos Y 285,5 Pos Z 0
Width 1358 Height 571
Anchors
Min X 0 Y 0
Max X 0 Y 0
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Canvas
Using a render mode of ScreenSpaceOverlay while VR is enabled will cause the Canvas to continue to incur a rendering cost, even though the Canvas will not be visible in VR.
Render Mode Screen Space - Overlay
Pixel Perfect
Sort Order
Target Display
Additional Shader Cha Nothing
Screen Space - Overlay
Screen Space - Camera
World Space

Canvas Scaler (Script)
UI Scale Mode Constant Pixel Size
Scale Factor 1
Reference Pixels Per U 100

Graphic Raycaster (Script)

Set the canvas size, position and scaling. Additionally set the canvas scaler to fit the text for the buttons which will be added later on.


Hierarchy
Create
MyFirstScene*
Main Camera
Directional Light
EventSystem
Canvas

Inspector
Canvas
Static
Tag Untagged
Layer UI

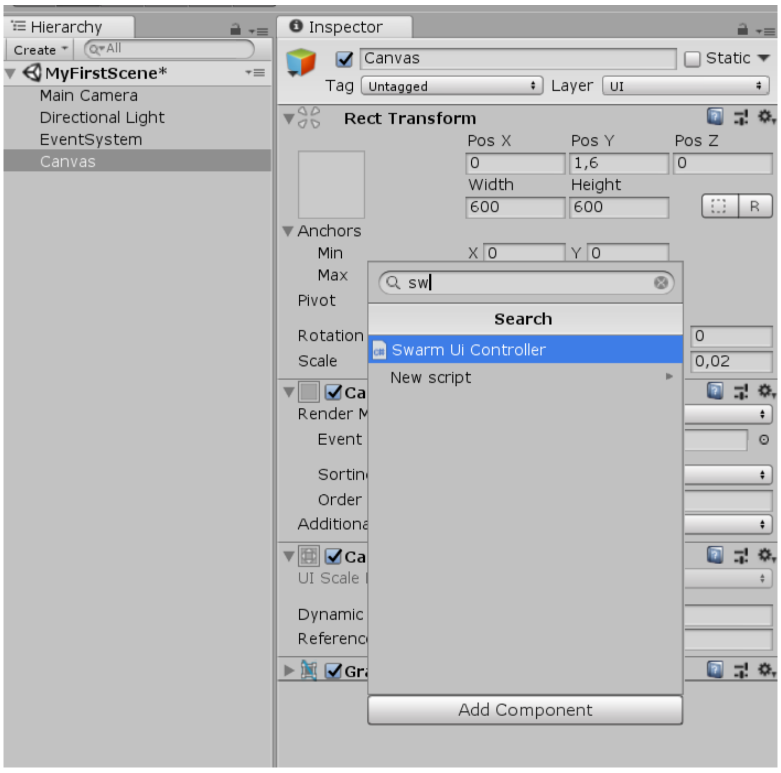
Rect Transform
Pos X 0
Pos Y 1,6
Pos Z 0
Width 600
Height 600
Anchors
Min X 0 Y 0
Max X 0 Y 0
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 0,02 Y 0,02 Z 0,02

Canvas
Render Mode World Space
Event Camera None (Camera)
Sorting Layer Default
Order in Layer 0
Additional Shader Chi Nothing

Canvas Scaler (Script)
UI Scale Mode World
Dynamic Pixels Per Ur 20
Reference Pixels Per U 50

Graphic Raycaster (Script)
Add Component

Now just add the **SwarmUi Controller** script to the canvas.

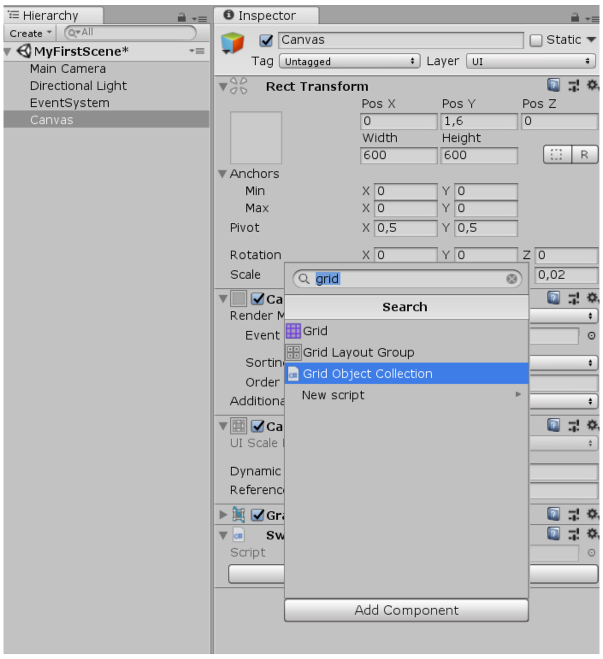

Hierarchy
Create
MyFirstScene*
Main Camera
Directional Light
EventSystem
Canvas

Inspector
Canvas
Static
Tag Untagged
Layer UI

Rect Transform
Pos X 0
Pos Y 1,6
Pos Z 0
Width 600
Height 600

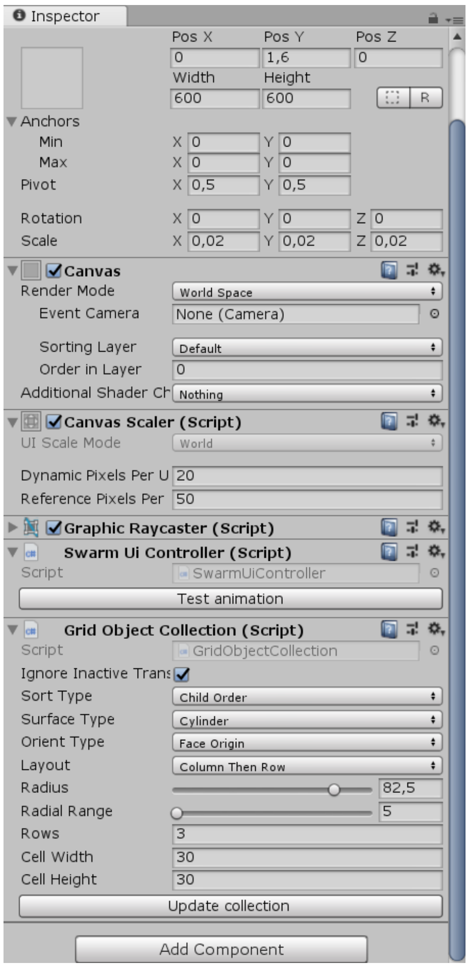
sw
Search
Swarm Ui Controller
New script
Add Component

Additionally add the **Grid Object Collection** Script



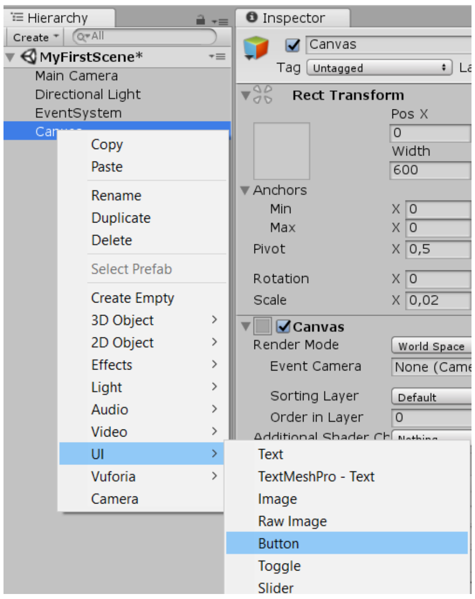
```
Hierarchy
MyFirstScene*
  Main Camera
  Directional Light
  EventSystem
  Canvas

Inspector
Canvas                         Static
Tag Untagged        Layer UI
Rect Transform
            Pos X    Pos Y    Pos Z
            0        1,6      0
            Width    Height
            600      600
Anchors
  Min       X 0      Y 0
  Max       X 0      Y 0
Pivot       X 0,5    Y 0,5
Rotation    X 0      Y 0      Z 0
Scale                         0,02

grid
Search
  Grid
  Grid Layout Group
  Grid Object Collection
  New script
Add Component
```

Now make sure the values match the following screenshot. The components will be described in detail later on.

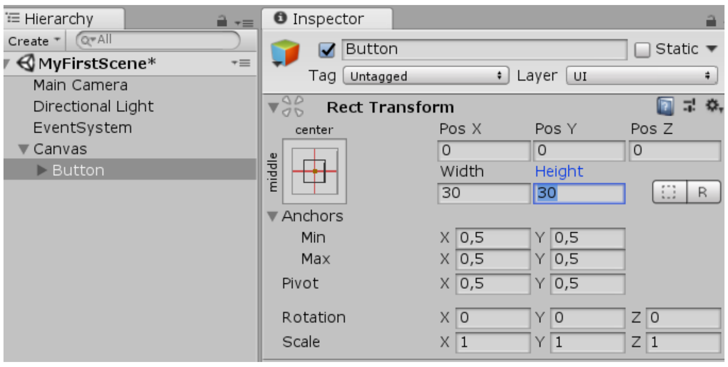


```
Inspector
            Pos X    Pos Y    Pos Z
            0        1,6      0
            Width    Height
            600      600
Anchors
  Min       X 0      Y 0
  Max       X 0      Y 0
Pivot       X 0,5    Y 0,5
Rotation    X 0      Y 0      Z 0
Scale       X 0,02   Y 0,02   Z 0,02

Canvas
Render Mode                World Space
  Event Camera             None (Camera)
  Sorting Layer            Default
  Order in Layer           0
Additional Shader Ch       Nothing

Canvas Scaler (Script)
UI Scale Mode              World
Dynamic Pixels Per U       20
Reference Pixels Per       50

Graphic Raycaster (Script)

Swarm Ui Controller (Script)
Script                     SwarmUiController
Test animation

Grid Object Collection (Script)
Script                     GridObjectCollection
Ignore Inactive Trans      ✓
Sort Type                  Child Order
Surface Type               Cylinder
Orient Type                Face Origin
Layout                     Column Then Row
Radius                     82,5
Radial Range               5
Rows                       3
Cell Width                 30
Cell Height                30
Update collection

Add Component
```

It’s time to add the first UI element in the SwarmUI. We start with a simple button. Right click the canvs in the hierarchy and select UI->Button. Select the button and change its size in the Inspector

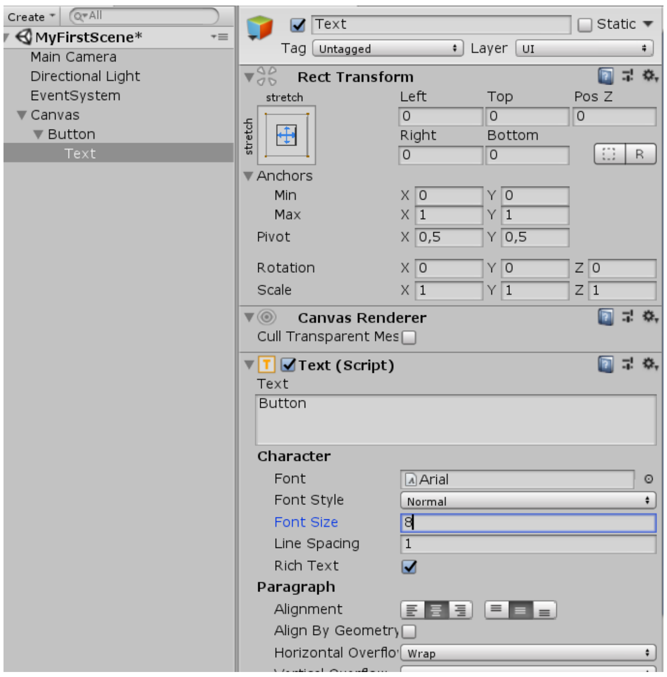


Canvas
Tag: Untagged
Rect Transform
Pos X: 0
Width: 600
Anchors
Min X: 0
Max X: 0
Pivot X: 0,5
Rotation X: 0
Scale X: 0,02
Canvas
Render Mode: World Space
Event Camera: None (Came
Sorting Layer: Default
Order in Layer: 0
Additional Shader Ch: Nothing



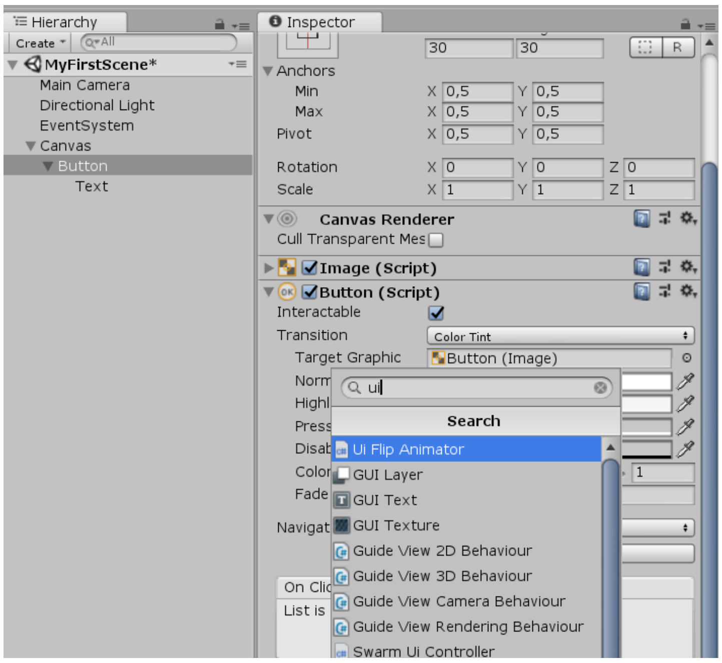
Button
Static
Tag: Untagged
Layer: UI
Rect Transform
center / middle
Pos X: 0
Pos Y: 0
Pos Z: 0
Width: 30
Height: 30
Anchors
Min X: 0,5 Y: 0,5
Max X: 0,5 Y: 0,5
Pivot X: 0,5 Y: 0,5
Rotation X: 0 Y: 0 Z: 0
Scale X: 1 Y: 1 Z: 1

Change the font size of the button. You can play around or find your best values by setting this font size and the values of the canvas scaler script on the canvas.



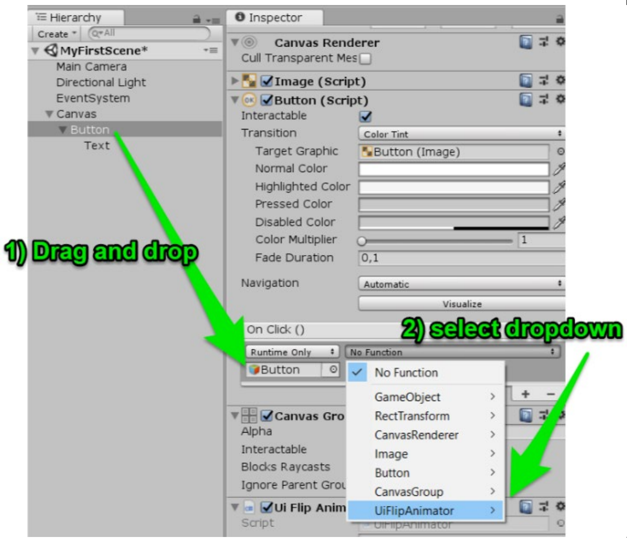
Text
Static
Tag: Untagged
Layer: UI
Rect Transform
stretch / stretch
Left: 0
Top: 0
Pos Z: 0
Right: 0
Bottom: 0
Anchors
Min X: 0 Y: 0
Max X: 1 Y: 1
Pivot X: 0,5 Y: 0,5
Rotation X: 0 Y: 0 Z: 0
Scale X: 1 Y: 1 Z: 1
Canvas Renderer
Cull Transparent Mes: ☐
Text (Script)
Text: Button
Character
Font: Arial
Font Style: Normal
Font Size: 8
Line Spacing: 1
Rich Text: ✓
Paragraph
Alignment
Align By Geometry: ☐
Horizontal Overflo: Wrap

Now add the **Ui Flip Animator** script to the button

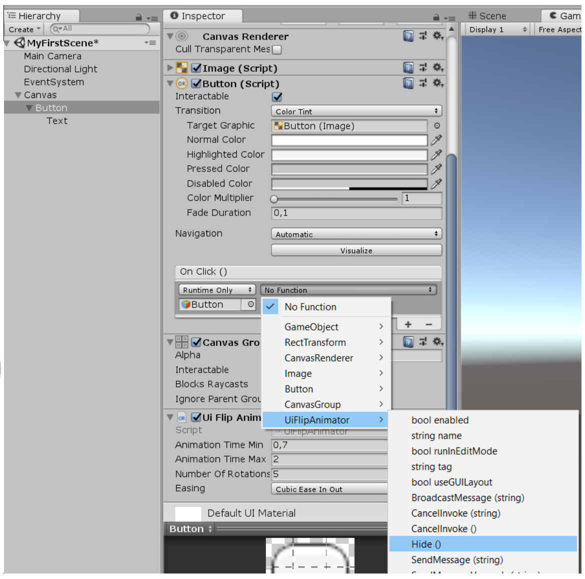

Hierarchy: MyFirstScene*, Main Camera, Directional Light, EventSystem, Canvas, Button, Text

Inspector:
Anchors
Min X 0,5 Y 0,5
Max X 0,5 Y 0,5
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1
Canvas Renderer
Cull Transparent Mes
Image (Script)
Button (Script)
Interactable ✓
Transition Color Tint
Target Graphic Button (Image)

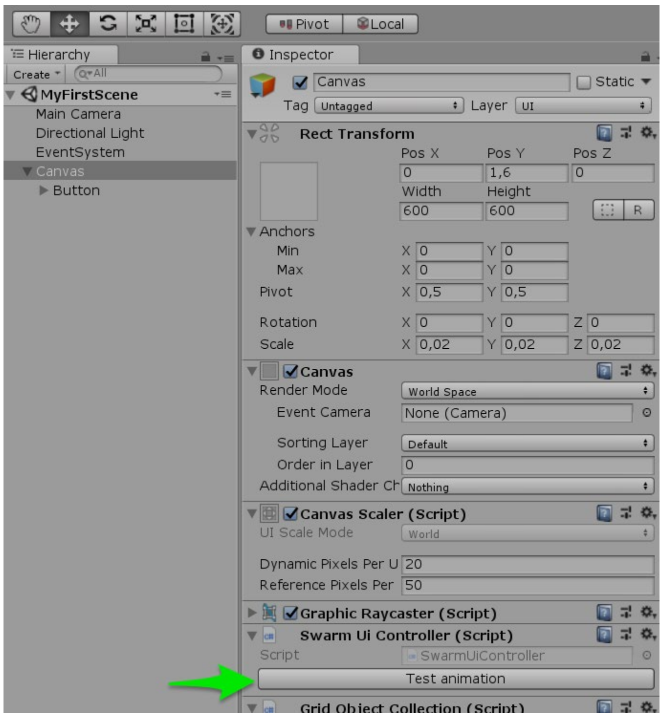
Link the click handler of the button with the **Ui Flip Animator** script and select the **Hide()** method.



On Click ()
Runtime Only | No Function
Button


Interactable ✓
Transition Color Tint
Target Graphic Button (Image)
Color Multiplier 1
Fade Duration 0,1
Navigation Automatic
Ui Flip Animator
Script UIFlipAnimator
Animation Time Min 0,7
Animation Time Max 2
Number Of Rotations 5
Easing Cubic Ease In Out

Now it's time for the first test run. Select the canvas (root element), **start the playmode** and hit the "**Test animation**" button. A button should swirl into the scene. To hide it, hit the "**Test animation**" button again or click it with any controller.



Pivot Local

Hierarchy
Create
MyFirstScene
Main Camera
Directional Light
EventSystem
Canvas
Button

Inspector
Canvas Static
Tag Untagged Layer UI

Rect Transform
Pos X 0 Pos Y 1,6 Pos Z 0
Width 600 Height 600
Anchors
Min X 0 Y 0
Max X 0 Y 0
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 0,02 Y 0,02 Z 0,02

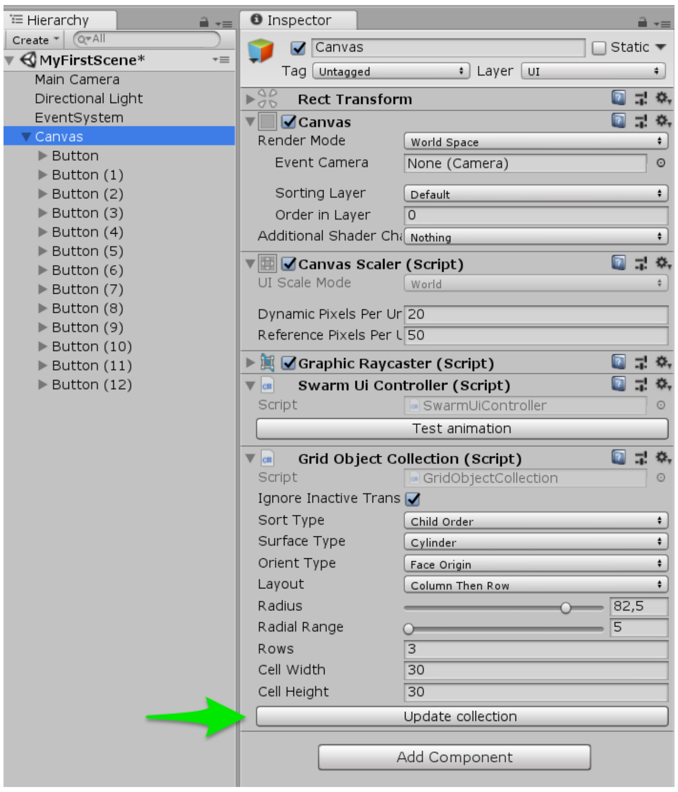
Canvas
Render Mode World Space
Event Camera None (Camera)
Sorting Layer Default
Order in Layer 0
Additional Shader Ch Nothing

Canvas Scaler (Script)
UI Scale Mode World
Dynamic Pixels Per U 20
Reference Pixels Per 50

Graphic Raycaster (Script)
Swarm Ui Controller (Script)
Script SwarmUIController
Test animation

Grid Object Collection (Script)

Now you can add a set of buttons (select the **button** and press ctrl+d to create lots of duplicates). Select the **canvas** again and press the "**Update collection**" button of the **Grid Object Collection** script. This should distribute the buttons on a curved grid.



Hierarchy
Create
MyFirstScene*
Main Camera
Directional Light
EventSystem
Canvas
Button
Button (1)
Button (2)
Button (3)
Button (4)
Button (5)
Button (6)
Button (7)
Button (8)
Button (9)
Button (10)
Button (11)
Button (12)

Inspector
Canvas Static
Tag Untagged Layer UI

Rect Transform

Canvas
Render Mode World Space
Event Camera None (Camera)
Sorting Layer Default
Order in Layer 0
Additional Shader Ch Nothing

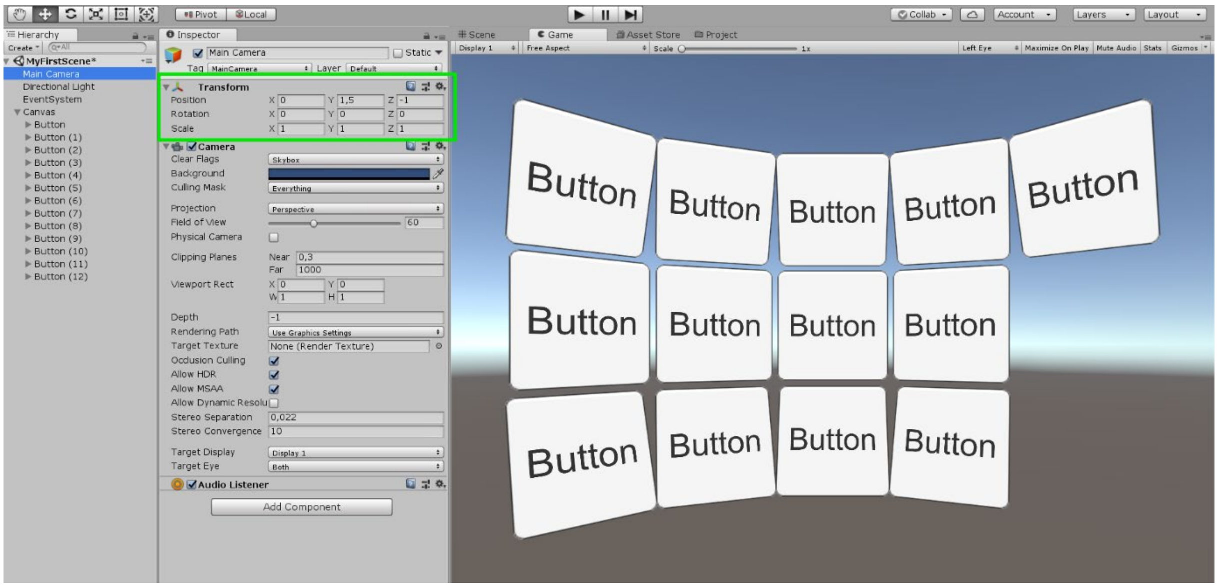
Canvas Scaler (Script)
UI Scale Mode World
Dynamic Pixels Per Ur 20
Reference Pixels Per U 50

Graphic Raycaster (Script)
Swarm Ui Controller (Script)
Script SwarmUIController
Test animation

Grid Object Collection (Script)
Script GridObjectCollection
Ignore Inactive Trans ✓
Sort Type Child Order
Surface Type Cylinder
Orient Type Face Origin
Layout Column Then Row
Radius 82,5
Radial Range 5
Rows 3
Cell Width 30
Cell Height 30
Update collection

Add Component

If the buttons are too far away or not visible, reset the camera parameters as shown in the following screenshot.



Main Camera — Tag: MainCamera — Layer: Default

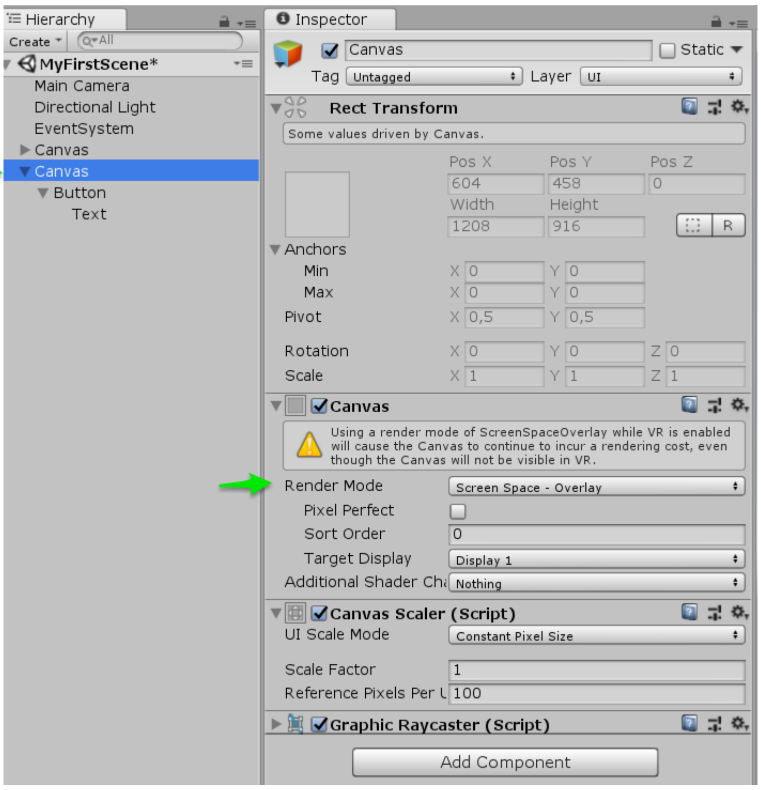
Transform
Position X 0 Y 1,5 Z -1
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Camera
Clear Flags: Skybox
Culling Mask: Everything
Projection: Perspective
Field of View: 60
Physical Camera: ☐
Clipping Planes: Near 0,3 Far 1000
Viewport Rect: X 0 Y 0 W 1 H 1
Depth: -1
Rendering Path: Use Graphics Settings
Target Texture: None (Render Texture)
Occlusion Culling: ✓
Allow HDR: ✓
Allow MSAA: ✓
Allow Dynamic Resolu: ☐
Stereo Separation: 0,022
Stereo Convergence: 10
Target Display: Display 1
Target Eye: Both

Audio Listener

You're done! Hit the play button and you can test the UI. To toggle the visibility just call "**ToggleVisibility**" of the **SwarmUiController** script.

Optional button for demo: Create a canvas in screenspace add a button and link the SwarmUiController script with the method ToggleVisibility to the buttons click event for testing and demonstration.



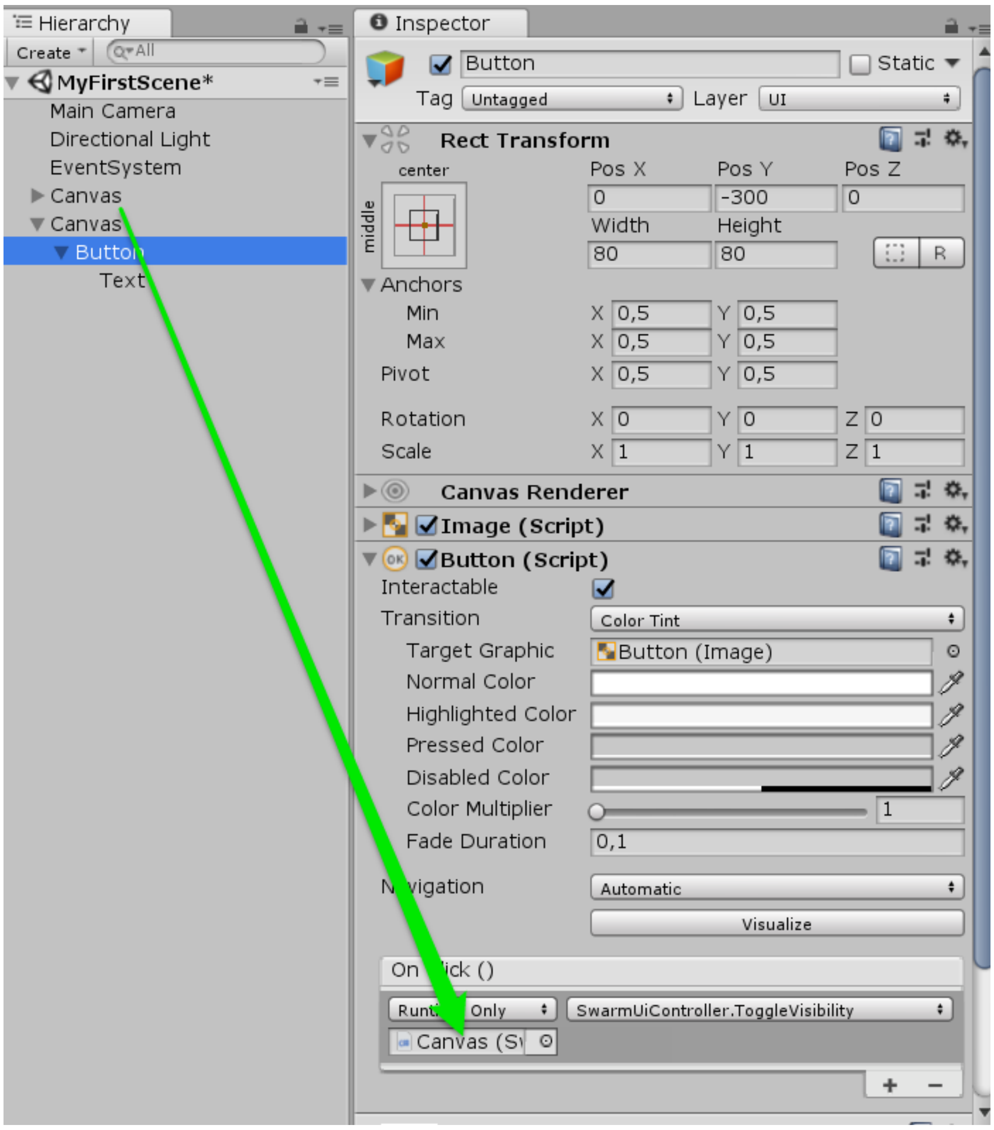
Canvas — Tag: Untagged — Layer: UI

Rect Transform
Some values driven by Canvas.
Pos X 604 Pos Y 458 Pos Z 0
Width 1208 Height 916
Anchors
Min X 0 Y 0
Max X 0 Y 0
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Canvas
Using a render mode of ScreenSpaceOverlay while VR is enabled will cause the Canvas to continue to incur a rendering cost, even though the Canvas will not be visible in VR.
Render Mode: Screen Space - Overlay
Pixel Perfect: ☐
Sort Order: 0
Target Display: Display 1
Additional Shader Chi: Nothing

Canvas Scaler (Script)
UI Scale Mode: Constant Pixel Size
Scale Factor: 1
Reference Pixels Per U: 100

Graphic Raycaster (Script)



MyFirstScene*
Main Camera
Directional Light
EventSystem
Canvas
Canvas
Button
Text

Button
Static
Tag Untagged
Layer UI

Rect Transform
center
middle
Pos X 0
Pos Y -300
Pos Z 0
Width 80
Height 80
Anchors
Min X 0,5 Y 0,5
Max X 0,5 Y 0,5
Pivot X 0,5 Y 0,5
Rotation X 0 Y 0 Z 0
Scale X 1 Y 1 Z 1

Canvas Renderer
Image (Script)
Button (Script)
Interactable ✓
Transition Color Tint
Target Graphic Button (Image)
Normal Color
Highlighted Color
Pressed Color
Disabled Color
Color Multiplier 1
Fade Duration 0,1
N vigation Automatic
Visualize

On lick ()
Runt Only
SwarmUiController.ToggleVisibility
Canvas (S

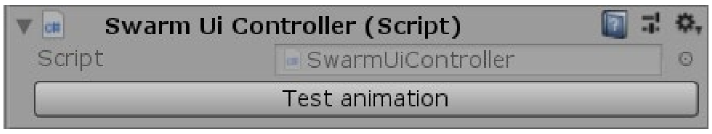
Description of components

Swarm Ui Controller

This script has to be on the the root of the Swarm Ui. It handles the visibility switch and provides the API to show and hide the whole SwarmUi.

See in the SwarmUiController.cs:

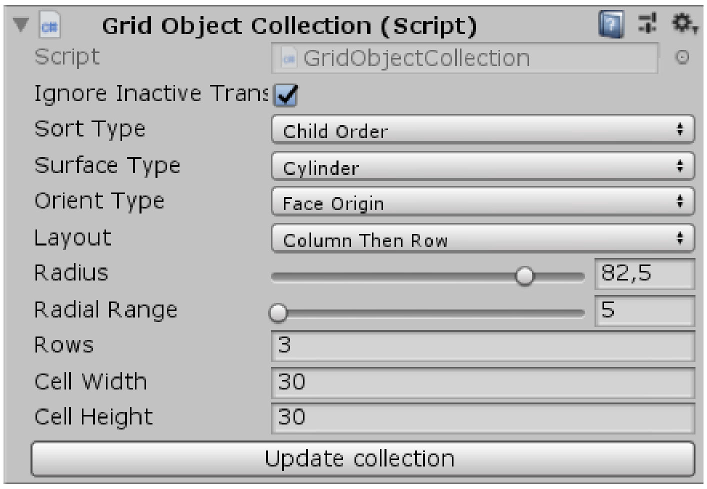
Show()
Hide()
ToggleVisiblity()



Swarm Ui Controller (Script)
Script SwarmUiController
Test animation

Grid Object Collection

This is a very handy tool from the Mixed Reality Toolkit (https://github.com/Microsoft/MixedRealityToolkit-Unity/tree/mrtk_release) to distribute entities of a collection in a curved matter. For the SwarmUi the **CellWidth** and **CellHeight** is of importance as these values should fit the Buttons size to avoid overlaps in the collection. You can play around for different results.



Grid Object Collection (Script)

Script	GridObjectCollection
Ignore Inactive Trans	✓
Sort Type	Child Order
Surface Type	Cylinder
Orient Type	Face Origin
Layout	Column Then Row
Radius	82,5
Radial Range	5
Rows	3
Cell Width	30
Cell Height	30

Ui Flip Animator

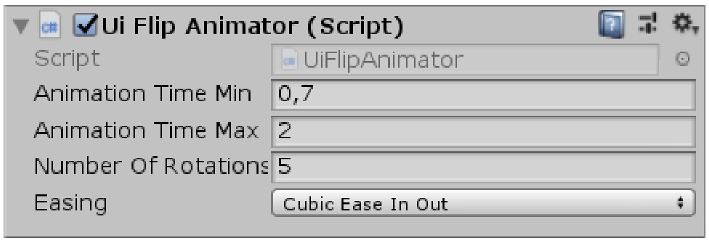
This script has to be placed on every child of the SwarmUiController root canvas. This animator requires the Canvas Group component for animated fade-in/outs. The animator is called by the SwarmUiController hence its API is not necessary to be called.

The fields:

Animation Time Min and Max: These 2 values define a time range in seconds where every time a random value will be generated in between for the fadein/out animation of each element. You can e.g. group elements by longer fade animations through setting bigger values for this range.

Number of Rotations: how often the ui element will rotate (360°) during the fade animation

Easing: A collection of easings to modify the animation speed.



✓ Ui Flip Animator (Script)

Script	UiFlipAnimator
Animation Time Min	0,7
Animation Time Max	2
Number Of Rotations	5
Easing	Cubic Ease In Out