# CONTOUR

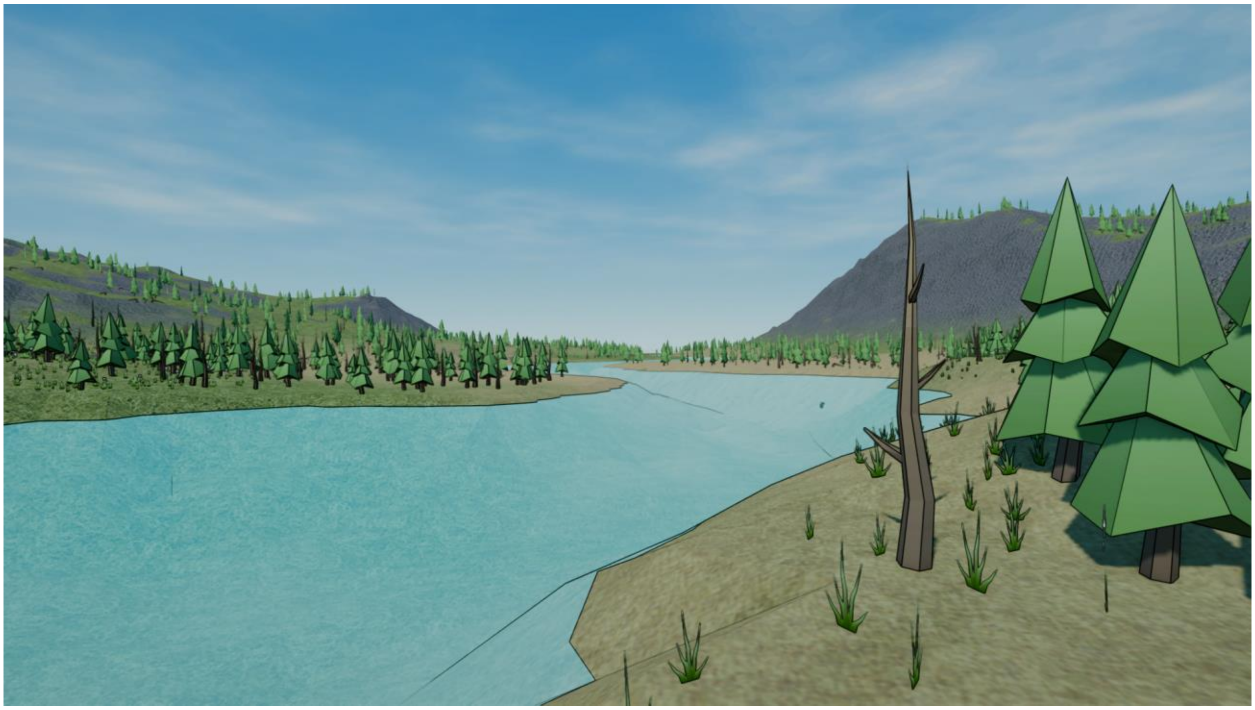
## Edge detection & outline post effect for Unity 6 URP

Version: 1.1

## USER GUIDE

This guide will show you how to set up and use the effect, the meaning of each setting and other related topics.

Tutorial videos are also available on our Youtube channel.



Website: https://pinwheelstud.io

# PROJECT REQUIREMENTS

For the asset to work at its best, please ensure your project meets the following requirements:

- Unity 6.0 and up.
- Universal Render Pipeline (Builtin RP and HDRP are NOT supported)

# STEP 1: IMPORTING THE ASSET

After purchasing Contour from the Asset Store, open the Unity editor, then go to Window/My Assets to open the Package Manager.

Search for Contour and click Import, then proceed to import everything into your project.

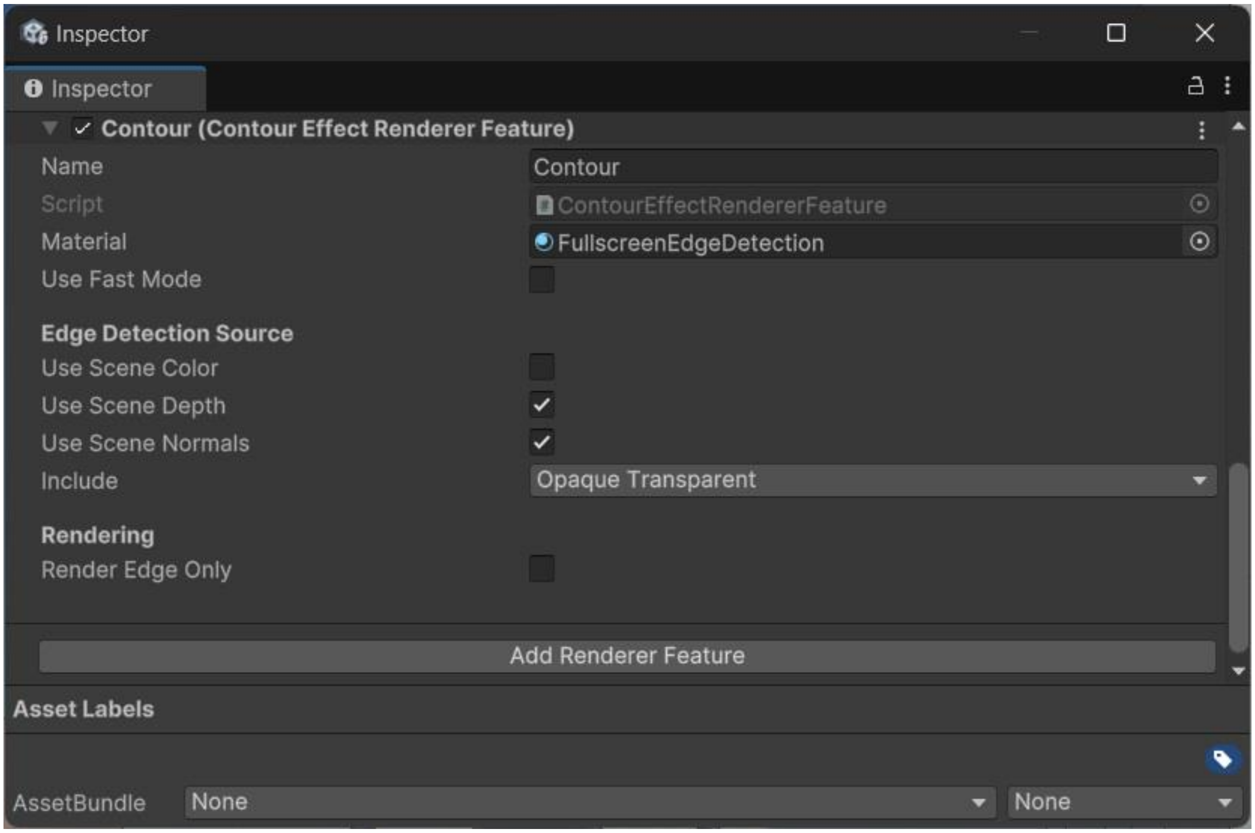
If you purchased Contour from our other storefronts, you'll likely get a .unitypackage file, drag and drop it into the Project window to import.

Finally, give it a few seconds to compile.

# STEP 2: ADDING RENDERER FEATURE

In the Project window, select your current URP Renderer Data Asset.

In the Inspector, click on Add Renderer Feature, then add a new **Contour Effect Renderer Feature**.



☑ Contour (Contour Effect Renderer Feature)

Name: Contour
Script: ContourEffectRendererFeature
Material: FullscreenEdgeDetection
Use Fast Mode □

Edge Detection Source
Use Scene Color □
Use Scene Depth ☑
Use Scene Normals ☑
Include: Opaque Transparent

Rendering
Render Edge Only □

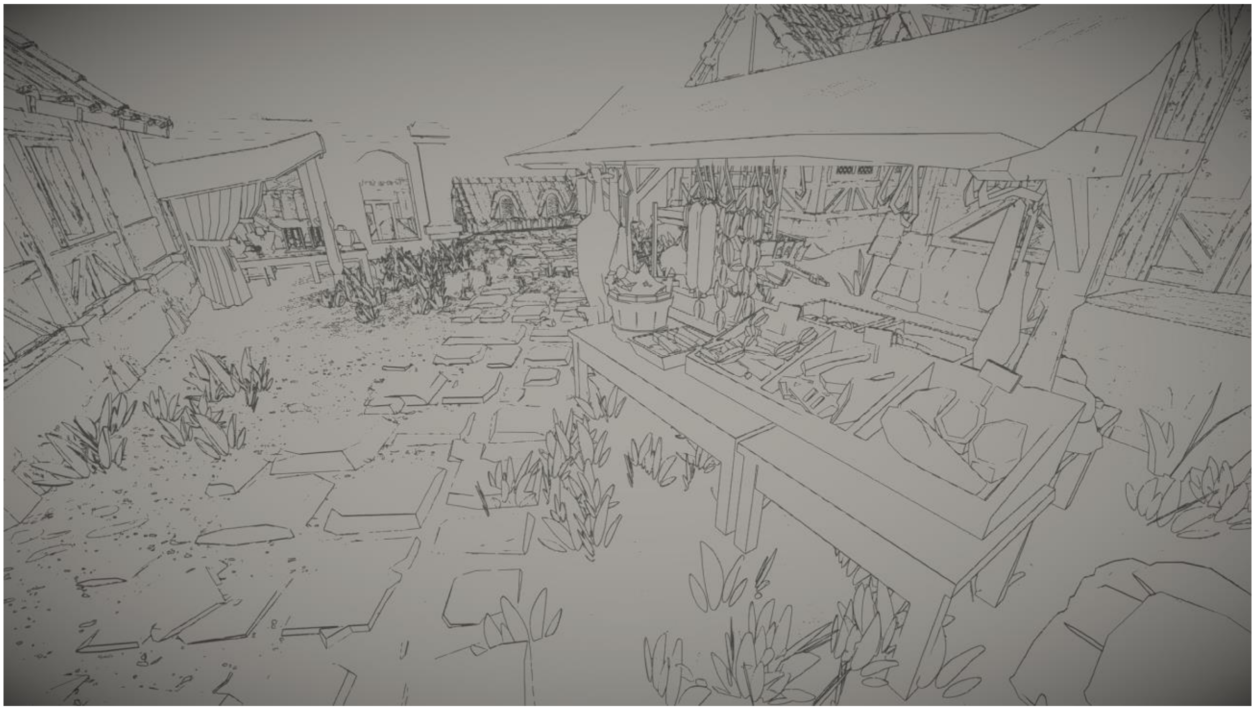
AssetBundle: None None

Repeat this step to add the renderer feature to all of your URP Renderer Data Assets in your project.

In the renderer feature, you will find the following settings:

- Material: a fullscreen material for the effect. This should be assigned automatically. The source material located under PinwheelStudio/ Contour/ Runtime/ Resources/ Contour/ FullscreenEdgeDetection.mat
- Use Fast Mode: Enable a faster algorithm. This option is mobile friendly but can miss a few edges.
- Use Scene Color: Detect edges from frame color, useful for transparent object and in-object textures (transparent objects don't write to depth & normal buffer).

- Use Scene Depth: Detect edges from scene depth. For some reason, this option works best with objects at close range (far away objects have inaccurate depth values that produce noise & artifacts).
- Use Scene Normals: Detect edges from scene normal. It draws an edge when surface orientation changes significantly.
- Include: What scene content to be included in the edge detection input. Default is Opaque & Transparent objects.
- Render Edge Only: This discards all scene color and replaces it with edge only content. Use this when you want to “debug” the edge detection settings or want to render the scene in “pencil sketch” style.



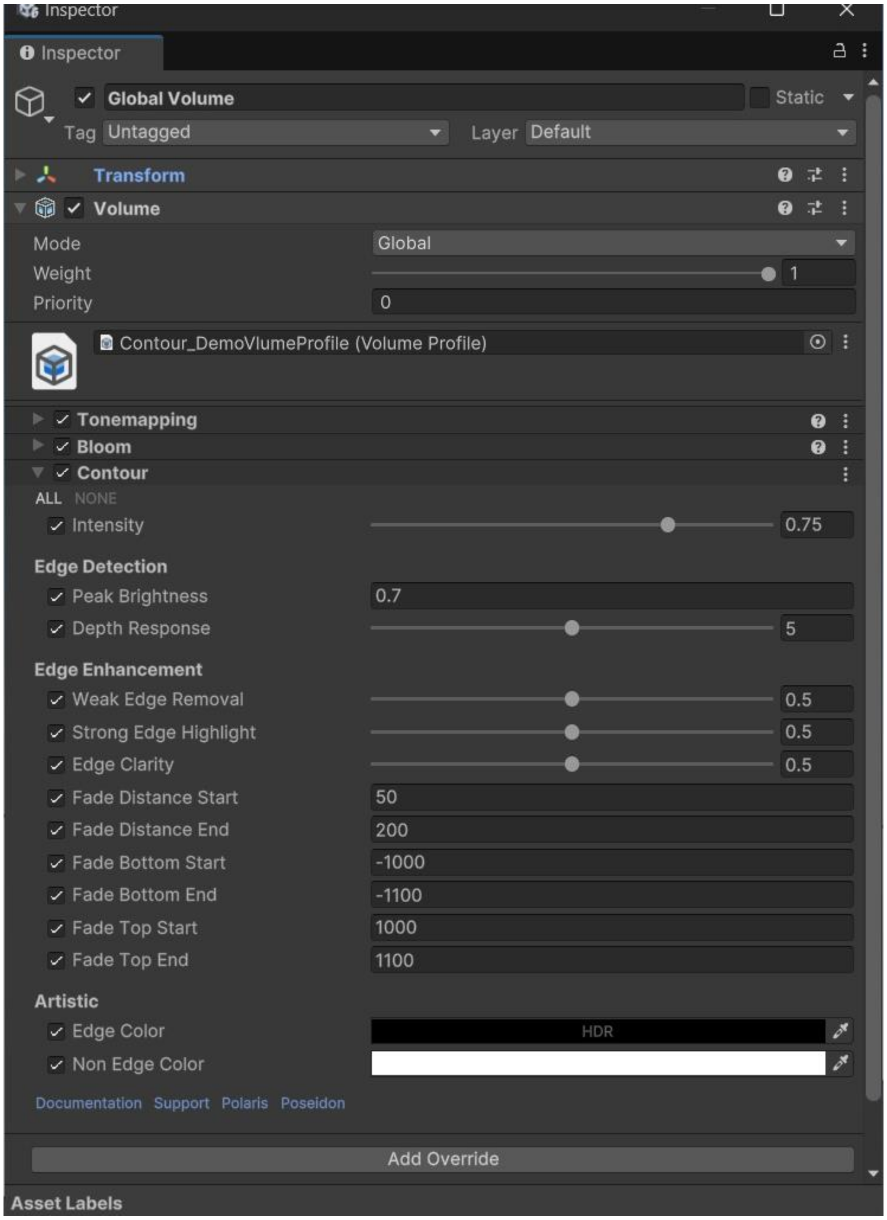
**Note:** You can only change these settings in the editor, not runtime. Consider creating many URP Renderer Data assets with different contour settings to switch between them at runtime.

**Note 2:** In case you have multiple URP Renderer Data assets, each Contour Effect Renderer Feature should have its own material (it uses shader keywords). Duplicate the source material and assign to the renderer feature accordingly.

# STEP 3: ADDING VOLUME OVERRIDE

This section assumes you have been familiar with Unity's Volume framework. Please refer to their documentation for more detail.

Select one of your volume in the scene, then add a new **Post Processing Custom/ Contour** override:



☑ Global Volume

Tag Untagged

Layer Default

Mode Global

Weight 1

Priority 0

Contour_DemoVlumeProfile (Volume Profile)

☑ Tonemapping

☑ Bloom

☑ Contour

☑ Intensity 0.75

Edge Detection

☑ Peak Brightness 0.7

☑ Depth Response 5

Edge Enhancement

☑ Weak Edge Removal 0.5

☑ Strong Edge Highlight 0.5

☑ Edge Clarity 0.5

☑ Fade Distance Start 50

☑ Fade Distance End 200

☑ Fade Bottom Start -1000

☑ Fade Bottom End -1100

☑ Fade Top Start 1000

☑ Fade Top End 1100

Artistic

☑ Edge Color HDR

☑ Non Edge Color

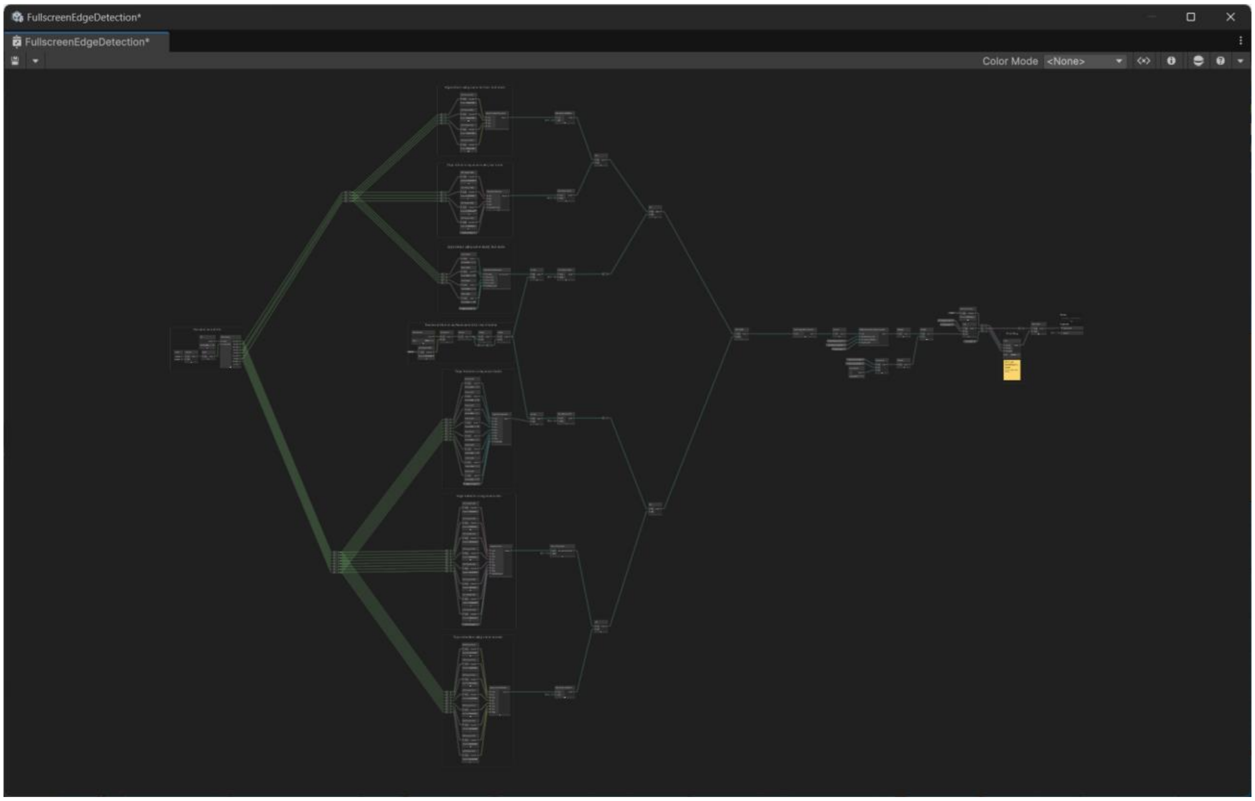
Inside the override, you will find the following settings:

- Intensity: Overall intensity/opacity of the effect. Set this to 0 will completely disable it from the render pipeline.
- Edge Detection:
    - Peak Brightness: Clamp the brightness value of input image. When you have a very bright specular reflection, there can be artifacts. Lowering this value can help. In contrast, higher values will help detect more edges in surfaces with similar texture color.
    - Depth Response: Higher values make it more sensitive to depth change, thus draws more edge. Too high can cause noise & artifacts.
- Edge Enhancement:
    - Weak Edge Removal: Remove noise/shadow-like artifacts from the image.
    - Strong Edge Highlight: Makes edges brighter/stronger.
    - Edge Clarity: Low values preserve the gradual fade out of edges, high values make them hard & sharp.
    - Fade Distance Start/End: The distance to fade out the edges, make them look less busy at a distance.
    - Fade Bottom/Top Start/End: Fade out the edge based on pixel world space position (y-coordinate), useful when you want to remove edges under the water surface, etc.
- Artistic:
    - Edge Color: Color of the edge, in HDR mode. Increase the intensity to make edge glow (with Bloom post processing)
    - Non Edge Color: Color of the background.

# BONUS: CHANGING BLEND MODE

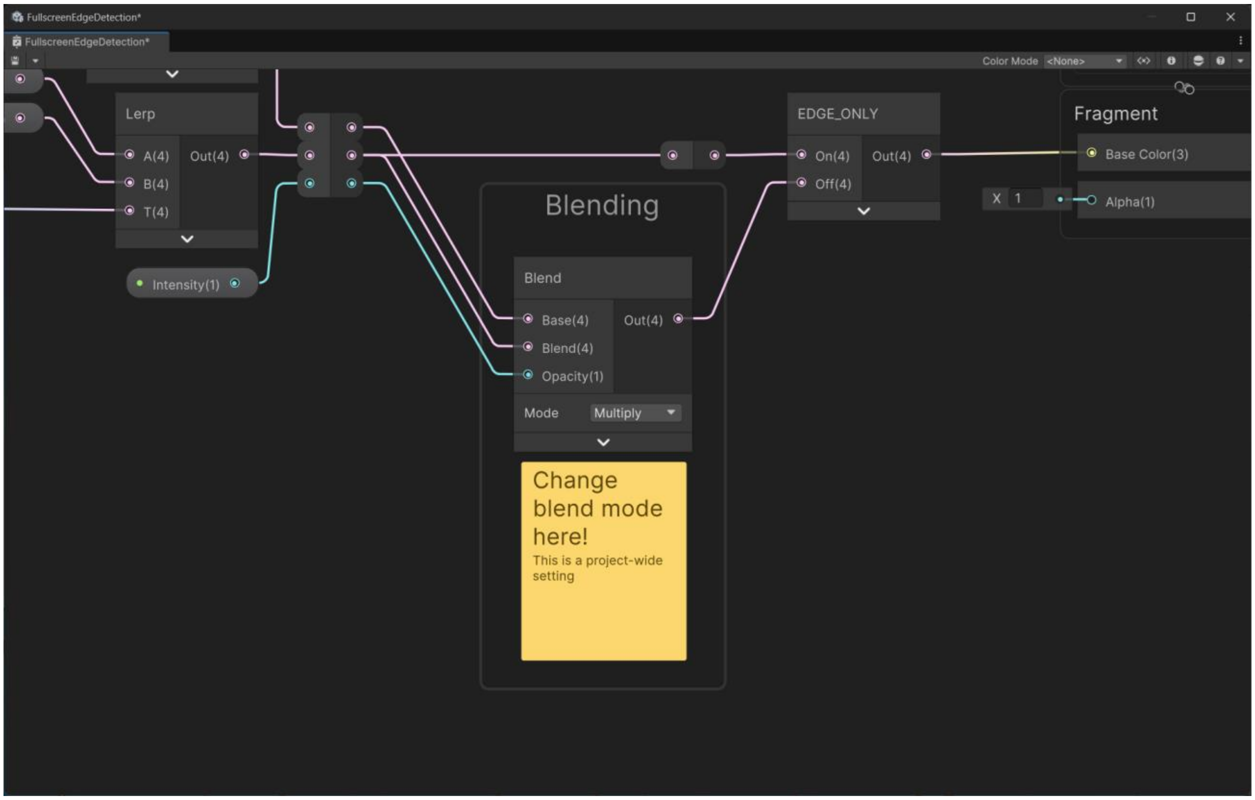
The shader was made with Shader Graph so you can easily modify it.

Open the graph, located at PinwheelStudio/ Contour/ Runtime/ Shaders/ FullscreenEdgeDetection.shadergraph



Color Mode <None>

Then look for a section named “Blending” with a sticky note:



Color Mode <None>

Mode Multiply

Change blend mode here!

This is a project-wide setting

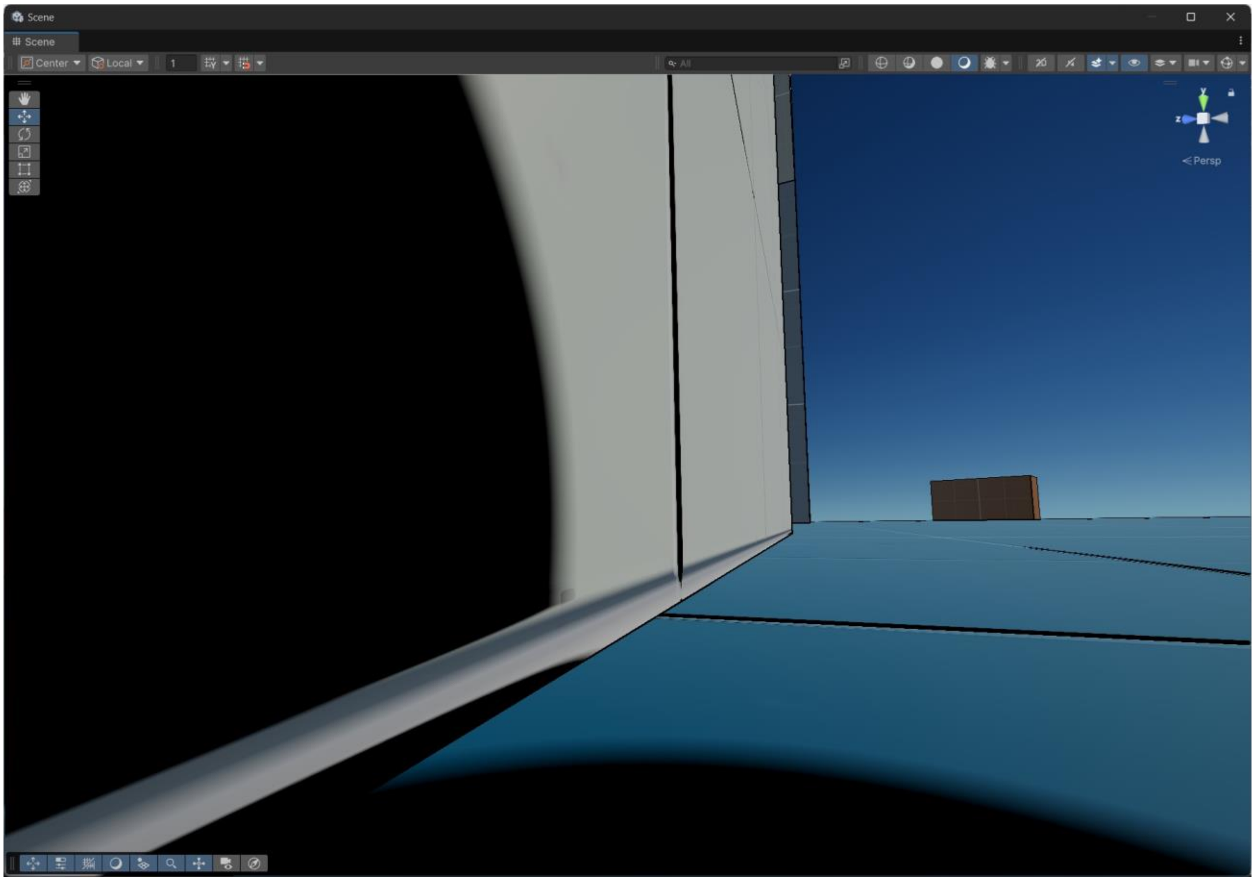
Change the Mode of the Blend node, save the graph and back to the scene.

You should understand how each blend mode works, which is out of scope for this document. This action should be done in conjunction with setting the Edge Color, Non Edge Color settings in your volume.

**Note:** This action is project wide, which will affect all scenes, all volumes, all renderer features.

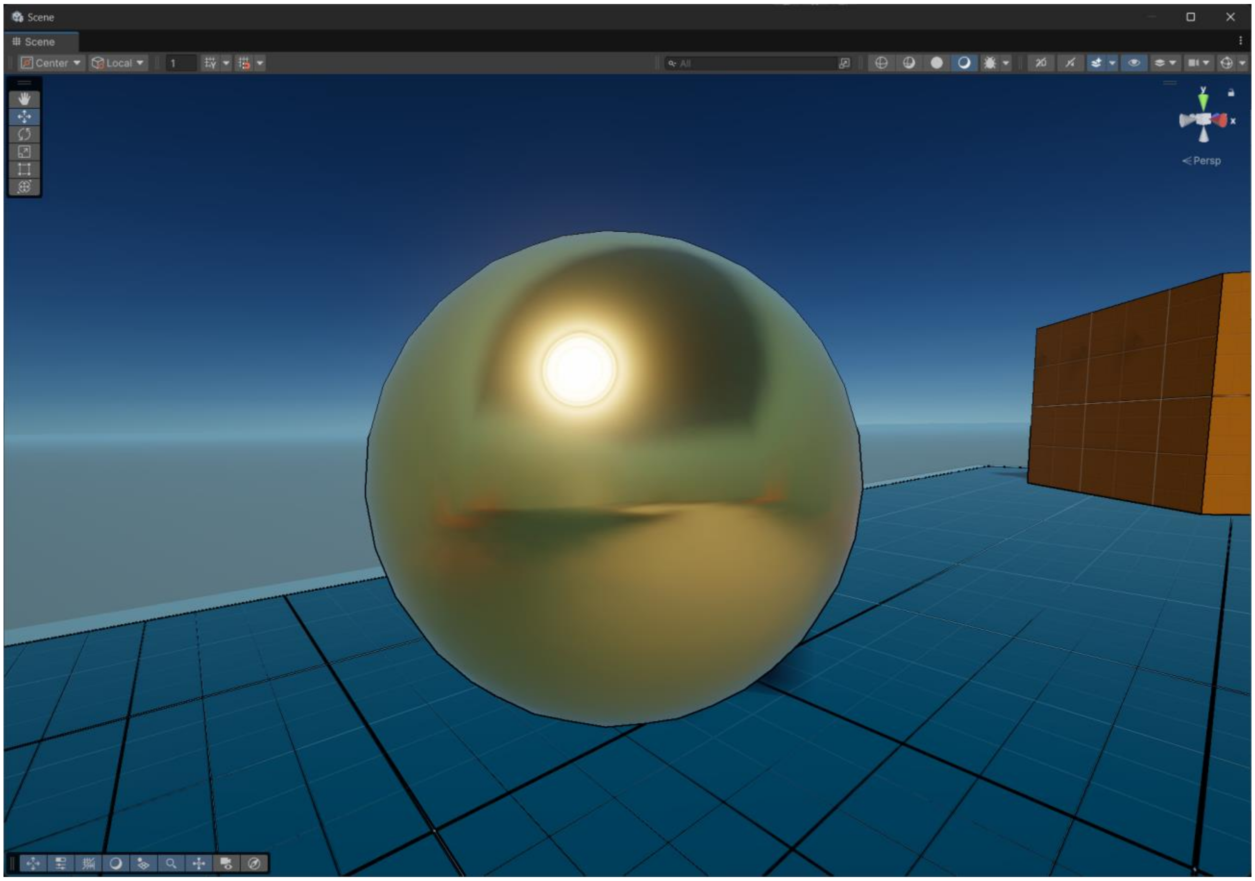
# TROUBLESHOOTING

## Black shadow when getting close to a surface



Solution: Reduce the Depth Response value in your volume and consider if the game camera can ever get this close to that surface in game.

# Artifact with bright specular reflection



This only happens when Use Scene Color is on.

Solution: Reduce Peak Brightness in your volume.