

Unity Add-on

Installation and Use

About

With this package, users can:

- Enter text prompts to generate **3D Gaussian Splats** assets
- Display **3D Gaussian Splats** assets inside Unity
- Perform basic transformations on **3D Gaussian Splats**

Installation

Software requirements

Unity 2022.3+

Instructions

1. Click "Add to My Assets"

2. Go to "My Assets" and click "Open in Unity"

3. Download the Package

- In Unity, create a new project or open an existing one
- If the Package Manager doesn't open automatically, go to **Window → Package Manager**
- Select 404—GEN from the list of your assets

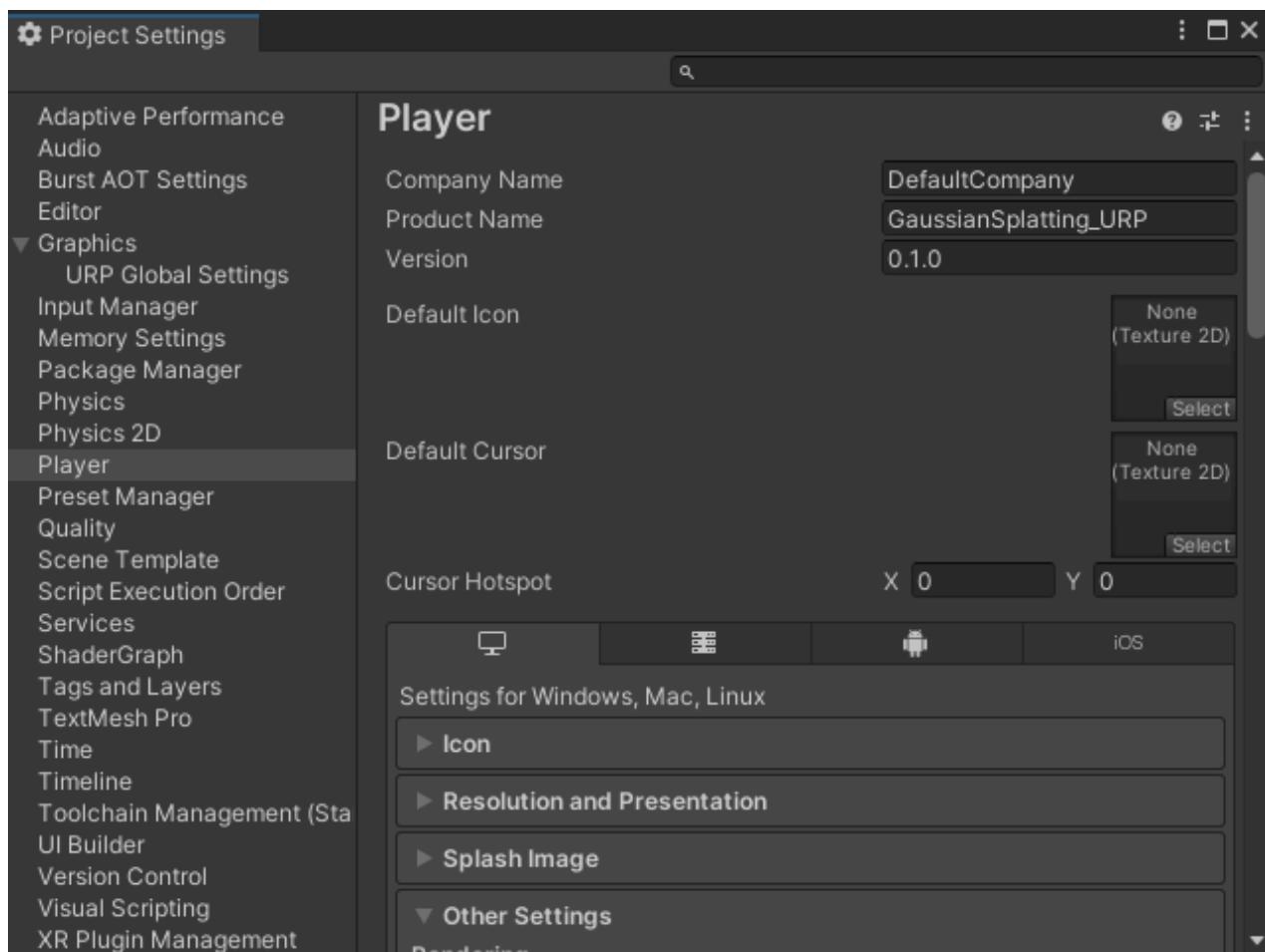
- Click "Download"

4. Import the Package

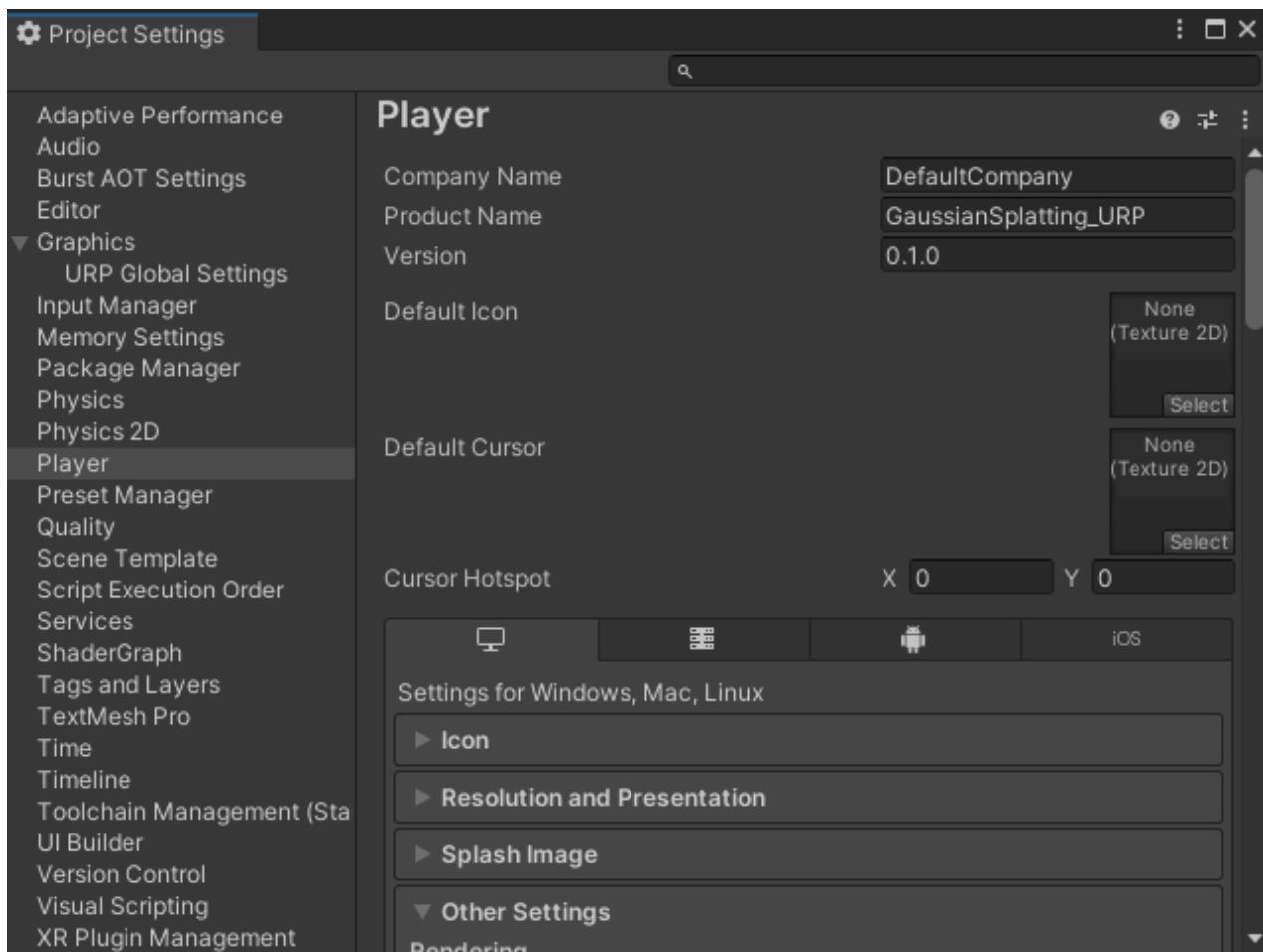
- After the package has been downloaded, click "Import"
- When the import window appears, keep all the files selected and click "Import"

5. Edit Project Settings

- **Go to Edit > Project Settings... and select the Player section from the left sidebar**
- Make sure that the correct rendering backend is selected
 - D3D12 on Windows
 - Metal on Mac
 - Vulkan on Linux



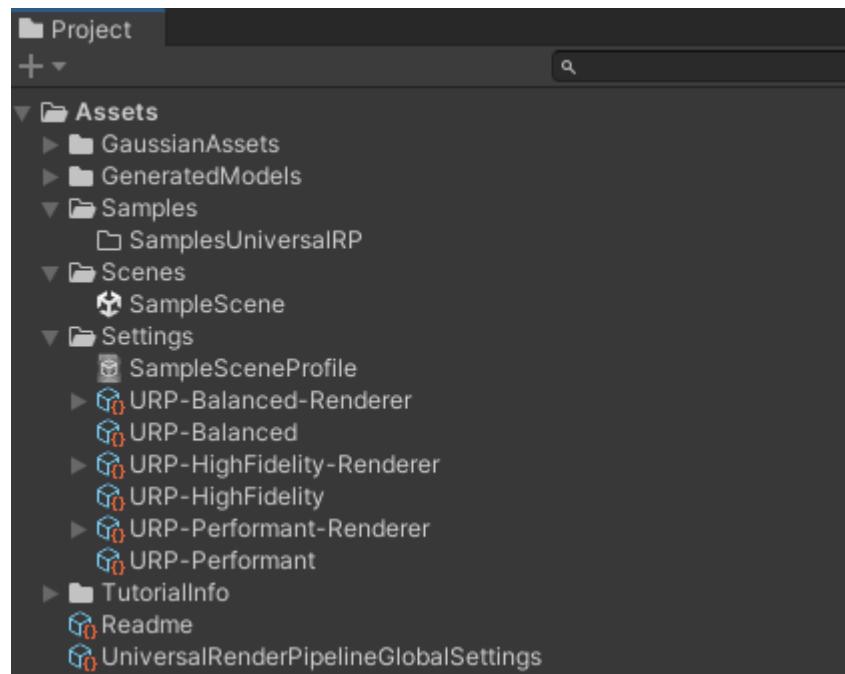
- Check the **Allow 'unsafe' code** box



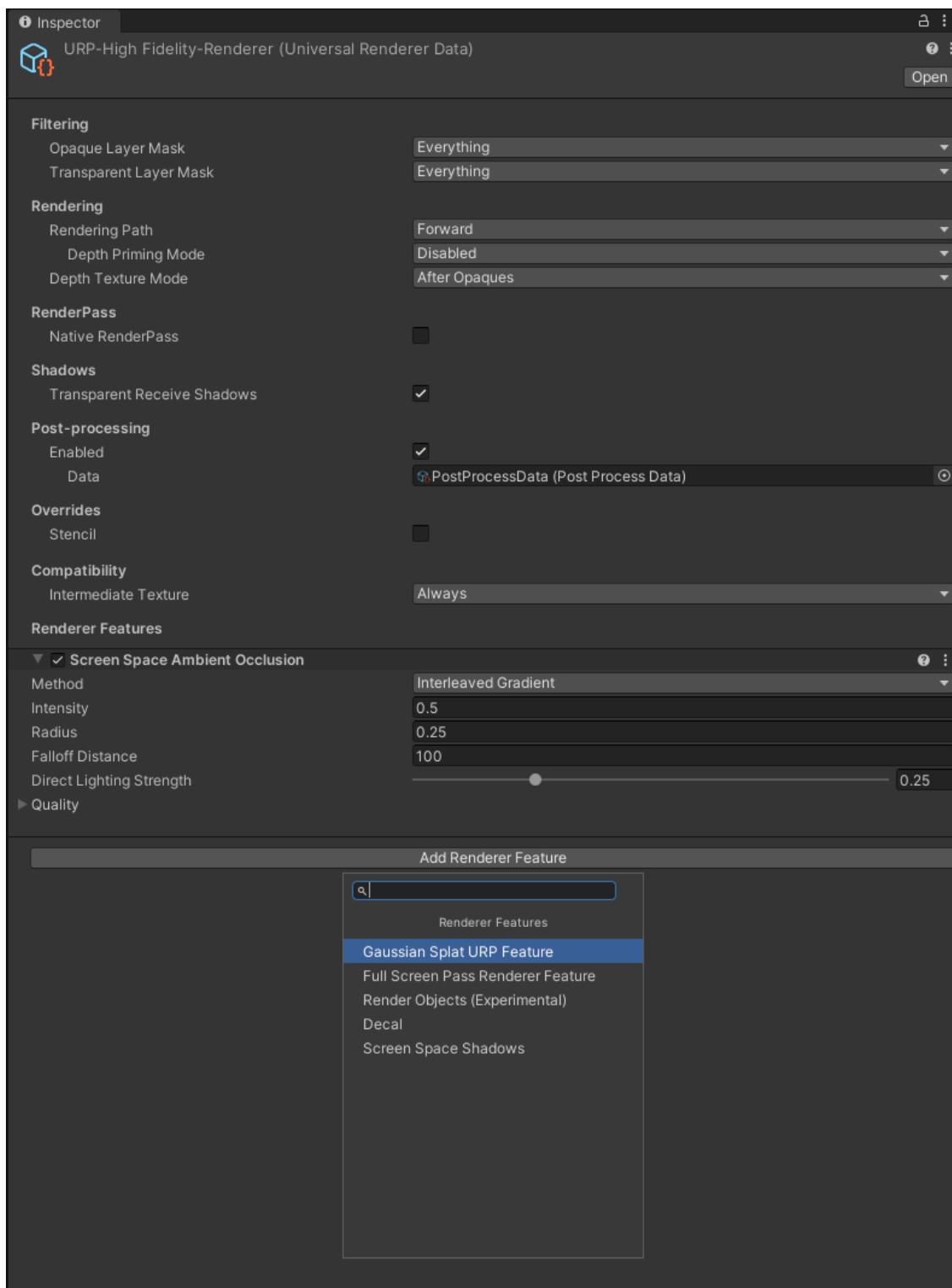
Universal Rendering Pipeline (URP)

As rendering Gaussian Splats differs from rendering 3D models represented with meshes and textures, a **Renderer Feature** must be added to the **URP Renderer Asset** for each of the three default quality levels, Balanced, HighFidelity, and Performant.

1. From the **Project** folder, go to **Assets** → **Settings**.
2. Select the asset labeled **URP-Balanced-Renderer**



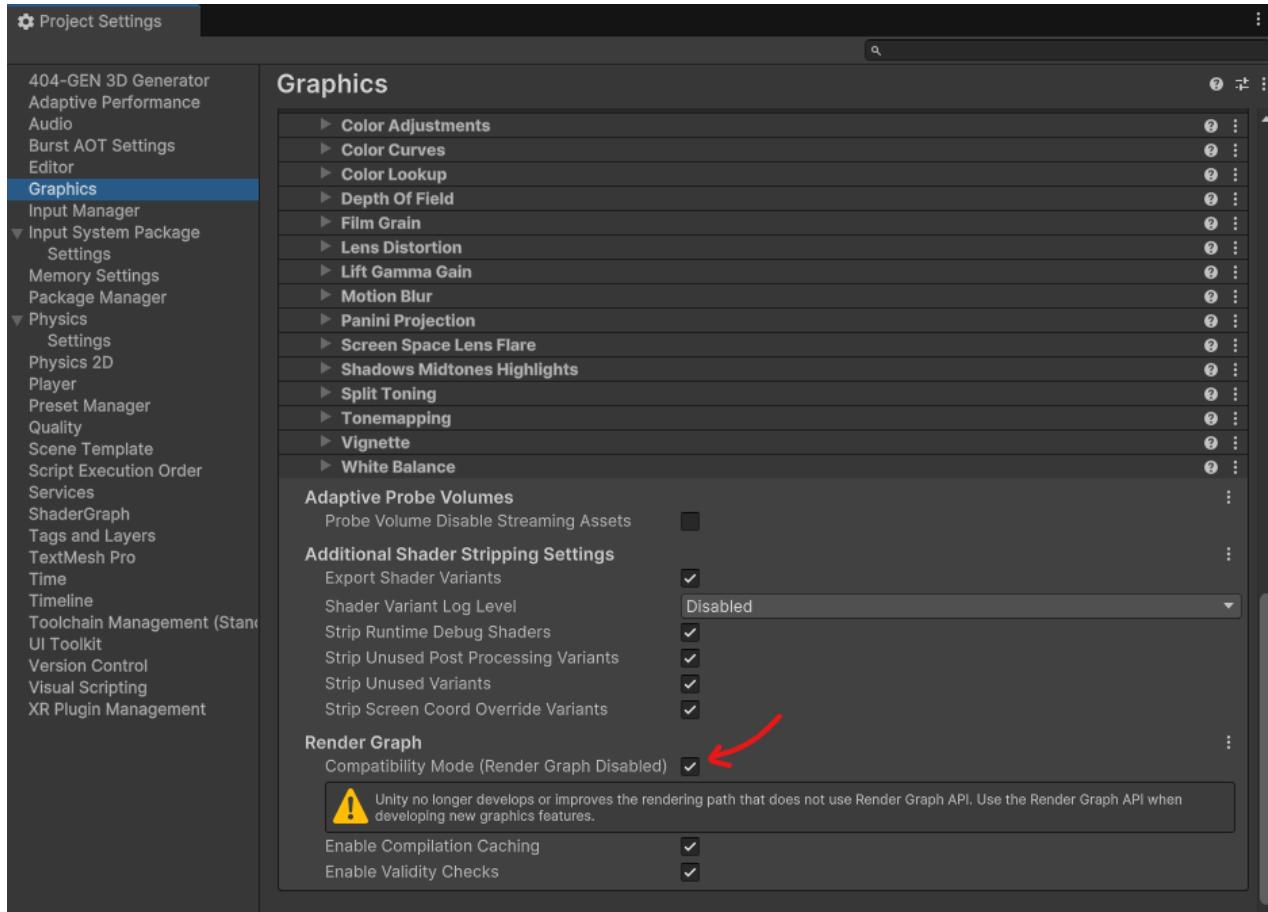
3. In the **Inspector**, under Renderer Features, click Add Renderer Feature
4. Select Gaussian Splat URP Feature



5. Repeat this process for the assets labeled `URP-HighFidelity-Renderer` and `URP-Performant-Renderer`

- (i)** These are the rendering pipeline setup files that are used in Unity's default examples.

- (i)** Unity 6 projects require enabling [Compatibility Mode \(Render Graph Disabled\)](#) in URP graphics settings to use custom implementation of Scriptable Render Pass without using the render graph API.

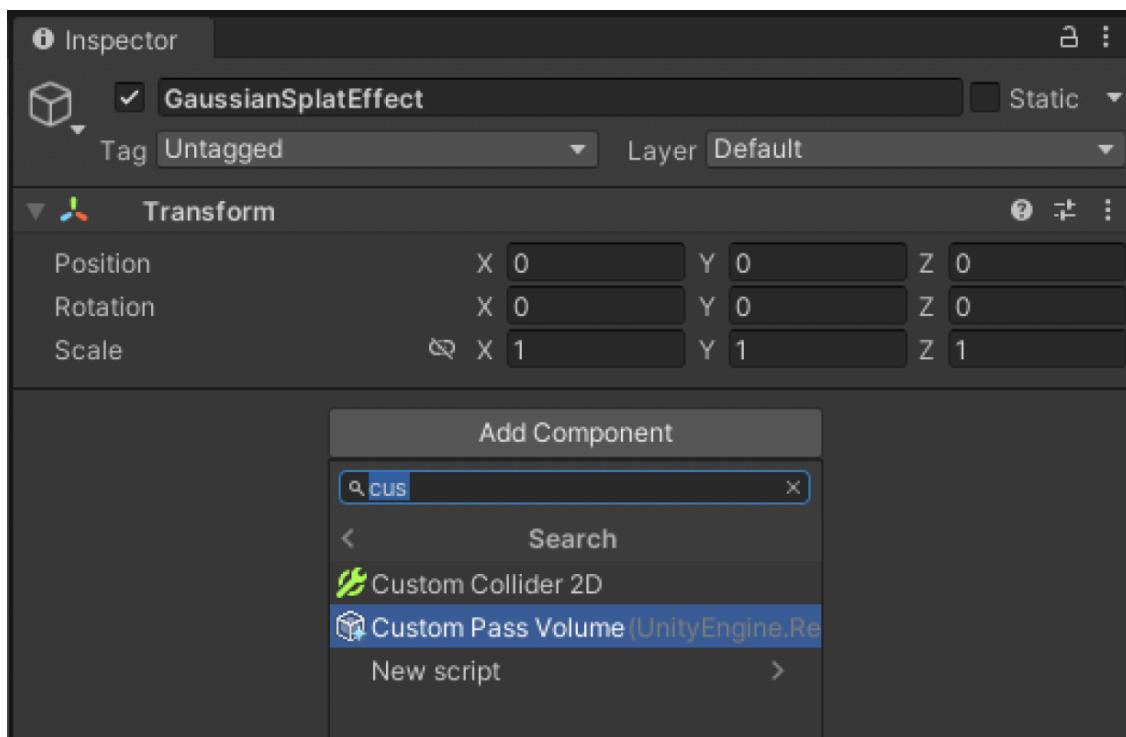


The setting is in Project Settings > Graphics > Pipeline Specific Settings > URP > Render Graph.

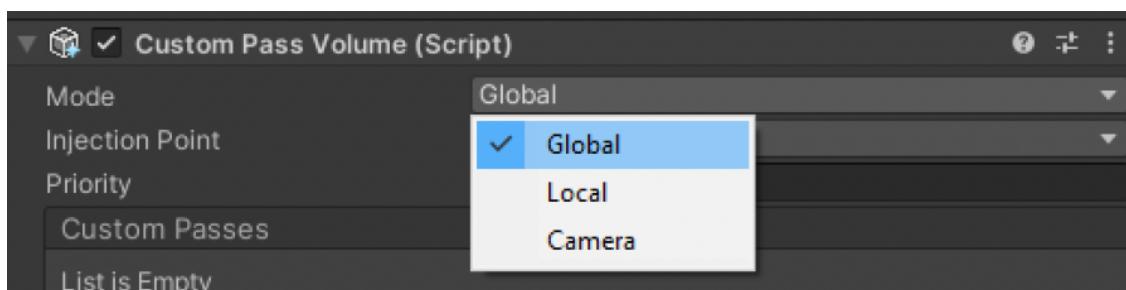
High Definition Rendering Pipeline (HDRP)

With HDRP, a Custom Pass Volume can be injected into the render loop, either globally or within a certain area.

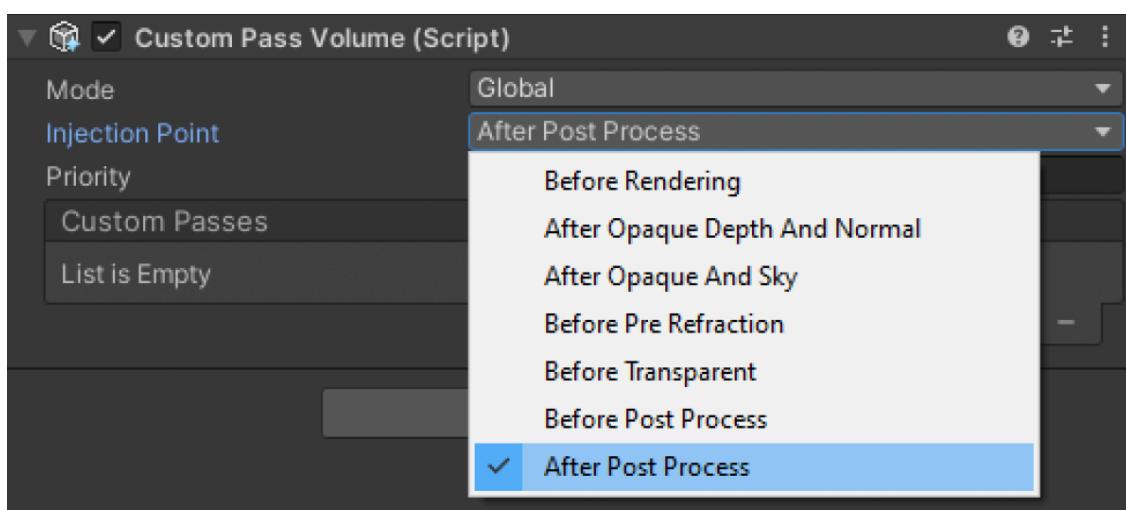
1. Go to **Game Object** → **Create Empty** to add a new Game Object to the scene and name it `GaussianSplatEffect`
2. In the **Inspector**, use the **Add Component** button to add a **Custom Pass Volume** either by searching for its name or by following the path: `Scripts -> UnityEngine.Rendering.HighDefinition -> Custom Pass Volume`



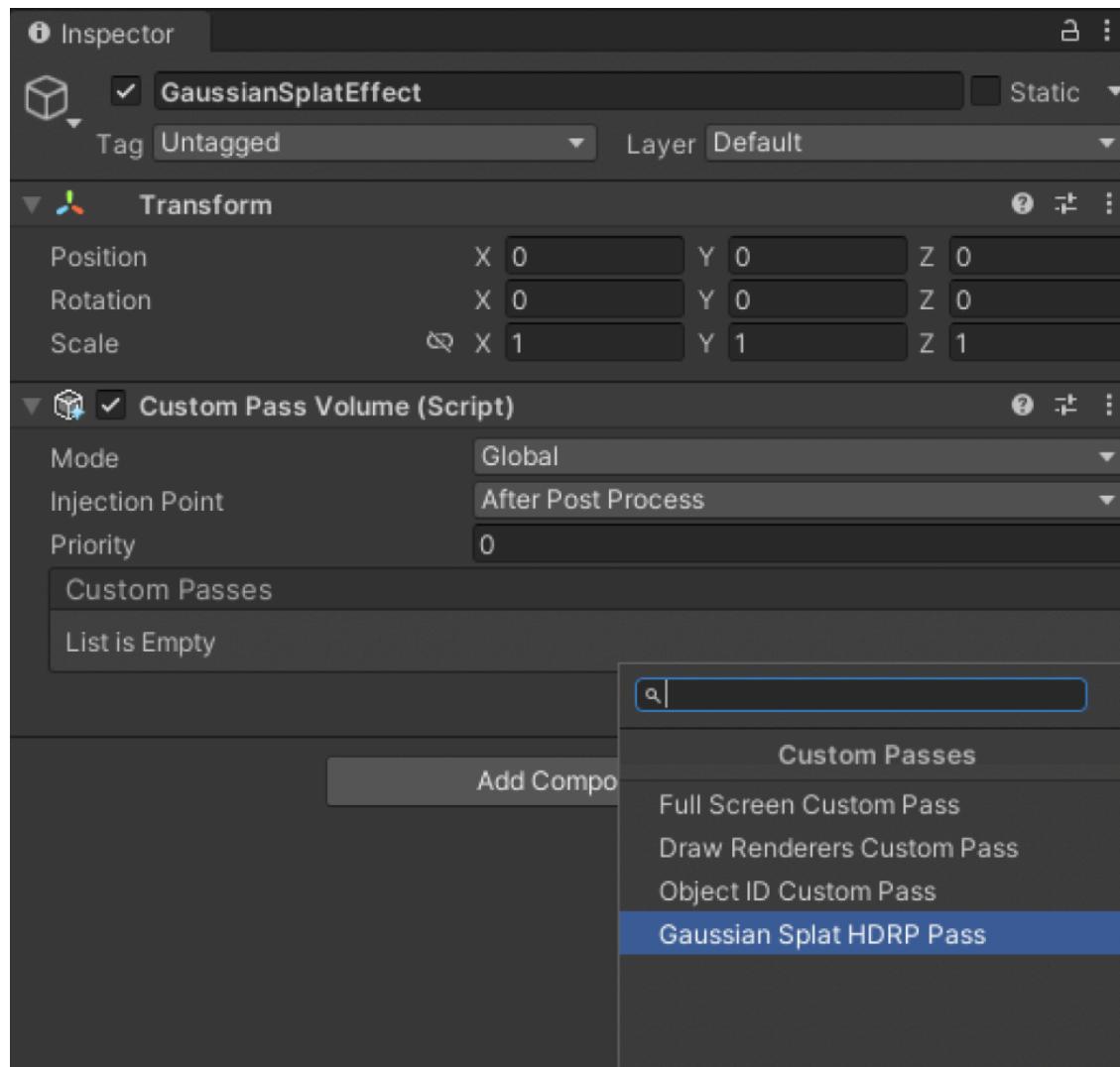
- Set the **Mode** to **Global** unless you only intend to use Gaussian Splats in a certain area of the scene, defined by colliders.



- Set the **Injection Point** to either **Before Transparencies** or **After Post Process** (recommended).



5. Under **Custom Passes** click the + button and select **Gaussian Splat HDRP Pass**.



Adding Custom Pass to the Gaussian Splat Effect Game Object in Inspector

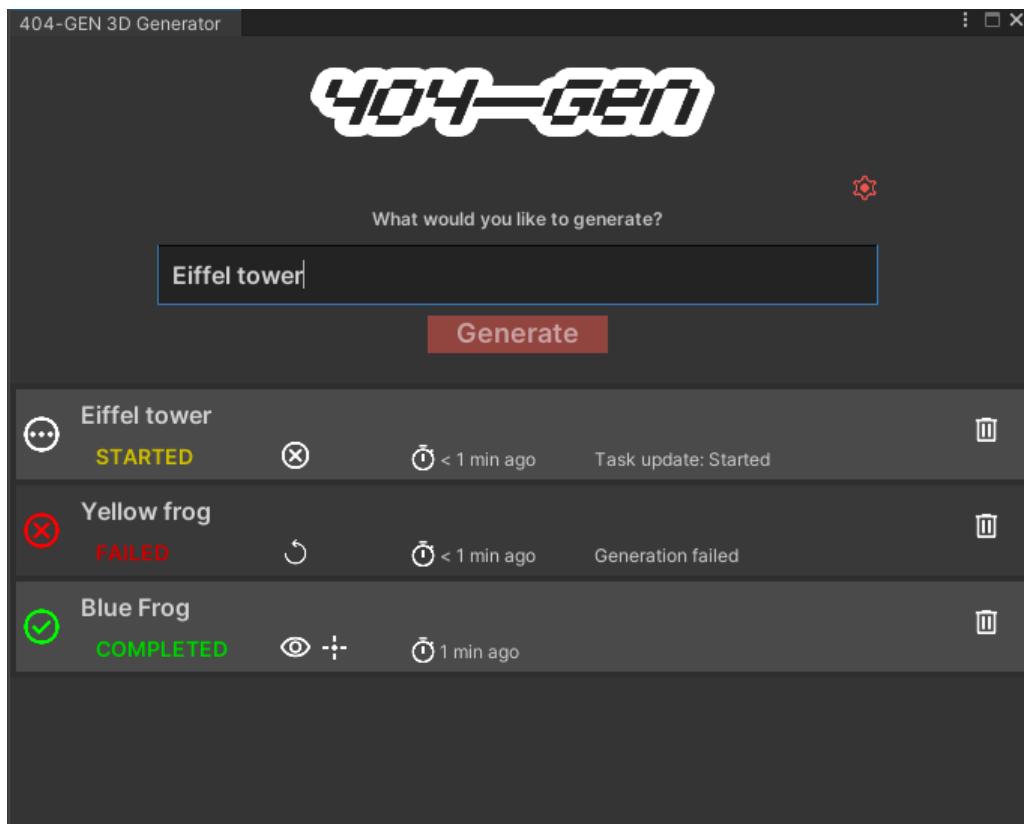
Usage

Generating

1. Go to **Window > 404-GEN 3D Generator** to open the generation window
2. Type your prompt and click Generate. Each generation should take **approximately one minute**.



- If the network is busy or fails to generate an acceptable result, a failure message will appear.



404—GEN 3D Generator window showing all three possible statuses

Prompts

For help structuring prompts, visit the Prompts section of this guide:



Prompts

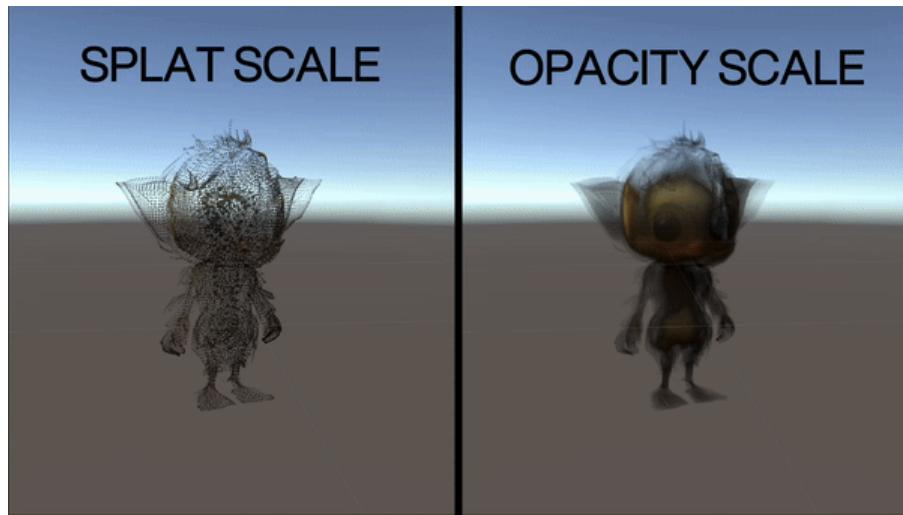


Transformations

In addition to the Position, Rotation, and Scale values in the Inspector, there are two easily adjustable values.

- **Splat Scale:** Controls the size of the points, represented by ellipsoids, in the Gaussian Splat

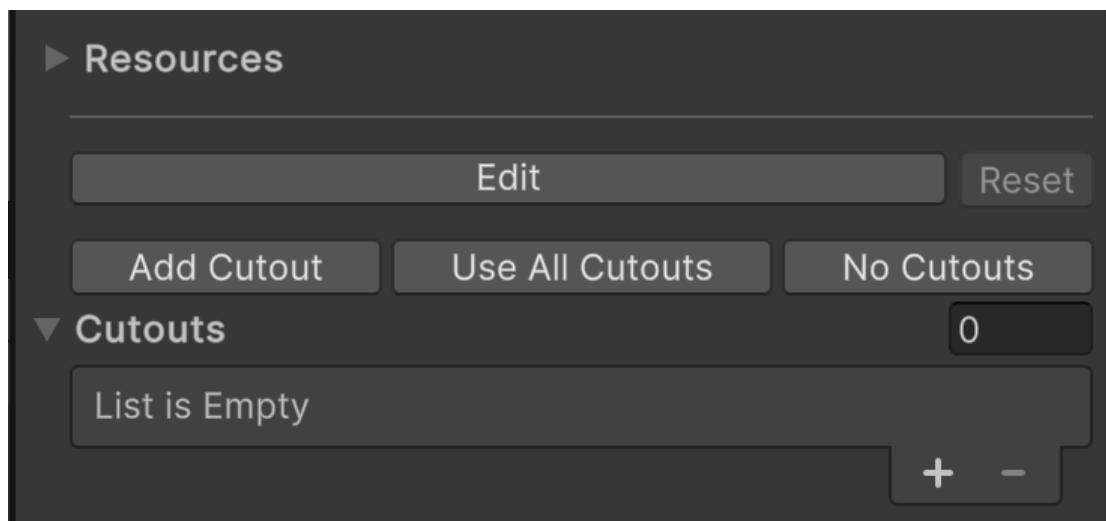
- **Opacity Scale:** Points within Gaussian Splats have varying degrees of opacity. This increases or decreases the opacity of all points.



Cutouts

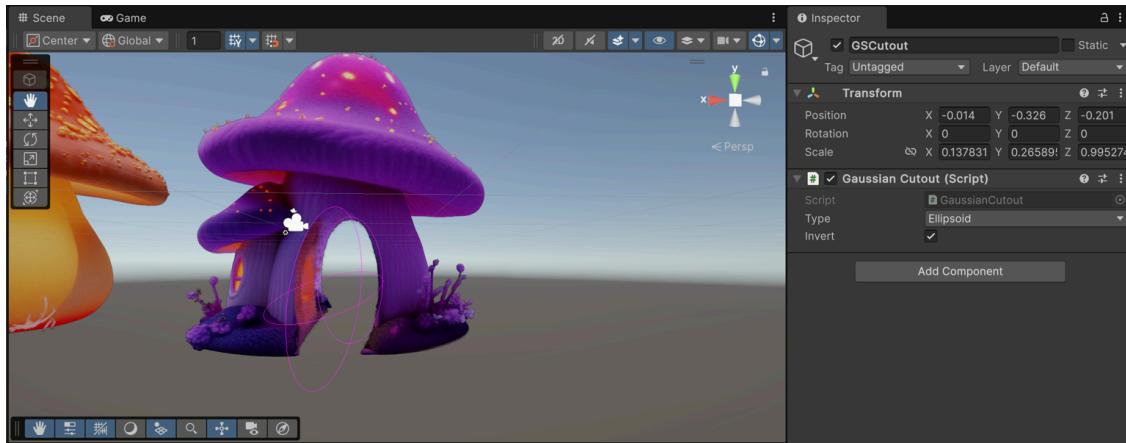
The cutouts feature can be used to hide a selection of points within the Gaussian Splat, defined by either a box or ellipsoid.

Create a cutout for a selected Gaussian Splat by clicking **Add Cutout** under the Cutouts heading of the Inspector.



Select a shape and move/scale/rotate as needed.

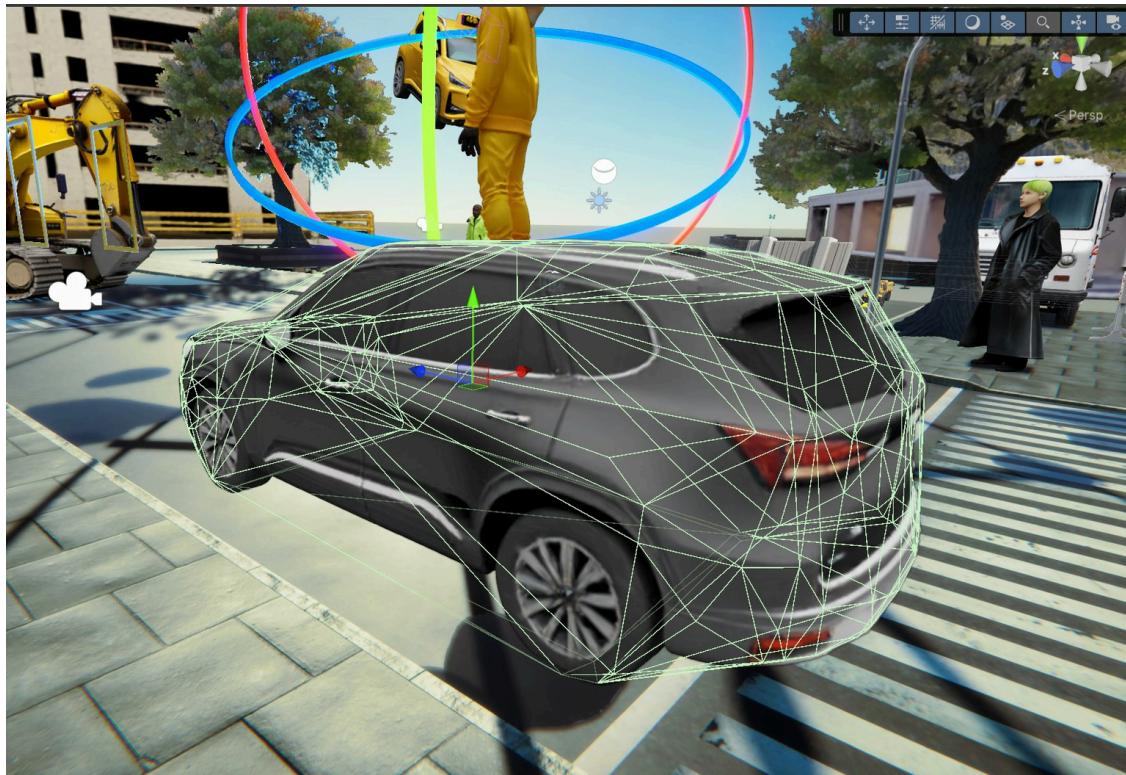
By default, only the points **inside** the cutout will be rendered. Select **Invert** to render the points **outside** the cutout.



Inverted Ellipsoid cutout applied to a Gaussian Splat

Mesh Collider

The **Add Mesh Collider** button in the Inspector will add a convex hull mesh collider. This collider applies to the original Gaussian Splat and does not apply cutouts.



Model with mesh collider

Gaussian Splats

To learn more about 3DGS (3D Gaussian Splatting), visit the Gaussian Splatting section of this guide:



3D Gaussian Splatting (3DGS)



Examples

