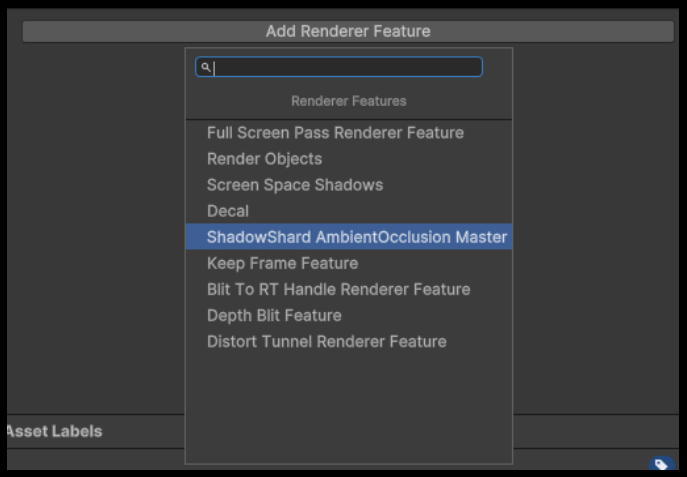
ShadowShard - URP Ambient Occlusion Master

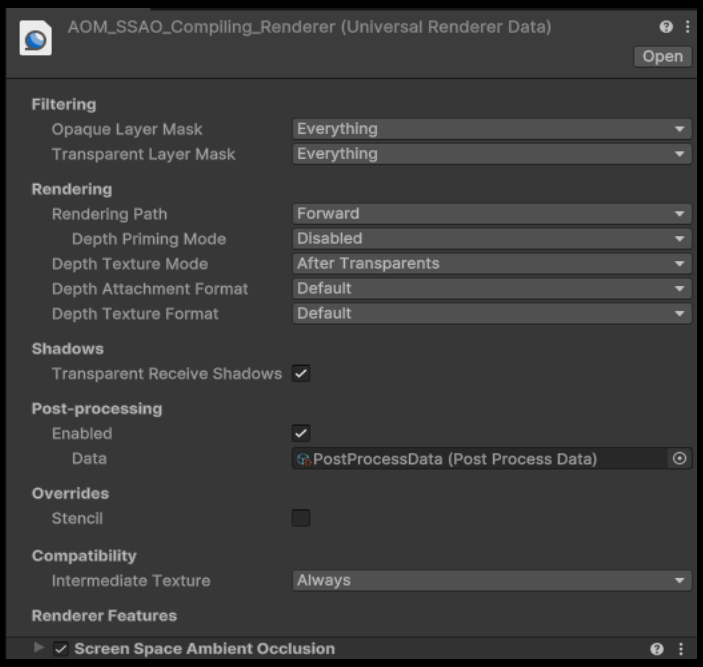
Getting Started

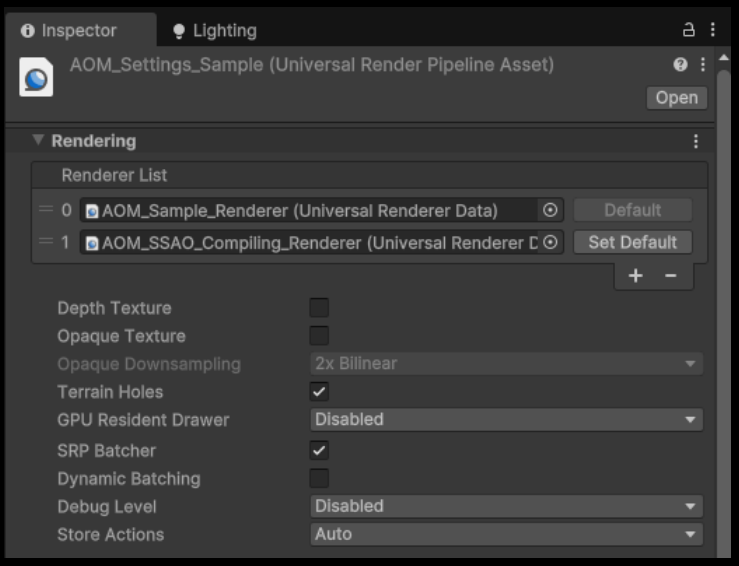
To begin using the asset in your Unity project, you'll need to configure your **URP Universal Renderer and URP Asset**.

1. Add ShadowShard Ambient Occlusion Master renderer feature

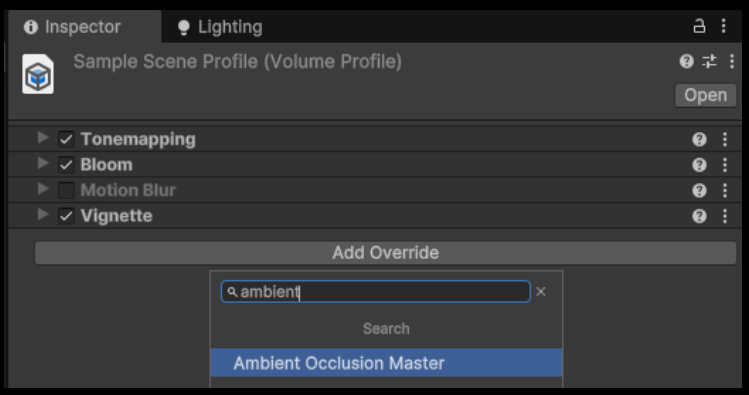


In order to work with the physical shading model (without After Opaque), add a Renderer Asset to your URP that will take into account that you have SSAO enabled. This is so that when Unity builds your project, it does not remove the keywords that are necessary for Ambient Occlusion Master to work.





2. Add ShadowShard Ambient Occlusion Master volume component to your Global Volume



SSAO Settings

Options overview

Setting	Description	Performance Impact
Intensity	This property defines the intensity of the darkening effect.	Low
Radius	When calculating the Ambient Occlusion value, the SSAO effect takes samples of the normal texture within this radius from the current pixel.	High
Falloff	SSAO does not apply to objects farther than this distance from the Camera. A lower value increases performance in scenes that contain many distant objects. The performance improvement is smaller in smaller scenes with fewer objects.	Depends on the application
Samples	For each pixel, the SSAO Render Feature takes this number of samples within the specified radius to calculate the Ambient Occlusion value. Increasing this value makes the effect smoother and more detailed, but reduces the performance. Available options: • **High: 12 Samples** • **Medium: 8 Samples** • **Low: 4 Samples**	High

HDAO Settings

Options overview

Setting	Description	Performance Impact
Intensity	This property defines the intensity of the darkening effect.	Low
Normal Intensity	Controls the influence of surface normals in the AO calculation. Higher values increase detail by factoring surface angles more prominently, enhancing shading contrast but requiring more computations, especially in high-detail scenes.	Very High
Reject Radius	Sets the maximum distance threshold for rejecting samples in AO calculations. Samples beyond this radius will not contribute to AO, allowing finer control over occlusion edges but increasing performance cost when using higher values.	High
Accept Radius	Defines the minimum distance within which samples are accepted in AO calculations. Samples within this radius are more likely to contribute to occlusion, resulting in softer shading at the cost of additional processing for fine distance detection.	High
Falloff	HDAO does not apply to objects farther than this distance from the Camera. A lower value increases performance in scenes that contain many distant objects. The performance improvement is smaller in smaller scenes with fewer objects.	Depends on the application
Samples	Determines the number of samples taken per pixel within the set radius for AO calculation. More samples yield smoother, more realistic shading at the cost of performance, while fewer samples increase performance but may appear grainier. Available options: • **Low:** 4 Samples • **Medium:** 8 Samples • **High:** 16 Samples • **Ultra :** 24 Samples	High

HBAO Settings

Options overview

Setting	Description	Performance Impact
Intensity	This property defines the intensity of the darkening effect.	Low
Radius	Sets the sampling distance around each pixel for calculating Ambient Occlusion. A larger radius captures more of the surrounding area, creating a softer, more diffuse effect. However, it increases computation and can reduce performance.	High
Max Radius In Pixels	Specifies the maximum radius in pixels for collecting samples, which can be adjusted to fine-tune AO effects across different screen resolutions. A lower value reduces the area sampled for AO, improving performance on higher resolutions.	Medium
Angle Bias	Adjusts the minimum angle at which AO is calculated between surfaces. A higher bias helps reduce shadow artifacts on flat surfaces by ignoring very small angles, ensuring a cleaner appearance.	Low
Falloff	HBAO does not apply to objects farther than this distance from the Camera. A lower value increases performance in scenes that contain many distant objects. The performance improvement is smaller in smaller scenes with fewer objects.	Depends on the application
Directions	Controls the number of directions from which samples are taken to calculate the AO effect. Higher values increase shadow detail, particularly for complex surfaces, but at a high performance cost. Available options: • **Directions 2** • **Directions 4** • **Directions 6**	High
Samples	Determines the number of samples taken per pixel within the set radius for AO calculation. More samples yield smoother, more realistic shading at the cost of performance, while fewer samples increase performance but may appear grainier. Available options: • **Samples 2** • **Samples 4** • **Samples 6** • **Samples 8**	High

GTAO Settings

Options overview

Setting	Description	Performance Impact
Intensity	This property defines the intensity of the darkening effect.	Low
Radius	Sets the sampling distance around each pixel for calculating Ambient Occlusion. A larger radius captures more of the surrounding area, creating a softer, more diffuse effect. However, it increases computation and can reduce performance.	High
Max Radius In Pixels	Specifies the maximum radius in pixels for collecting samples, which can be adjusted to fine-tune AO effects across different screen resolutions. A lower value reduces the area sampled for AO, improving performance on higher resolutions.	Medium
Falloff	GTAO does not apply to objects farther than this distance from the Camera. A lower value increases performance in scenes that contain many distant objects. The performance improvement is smaller in smaller scenes with fewer objects.	Depends on the application
Directions	Controls the number of directions from which samples are taken to calculate the AO effect. Higher values increase shadow detail, particularly for complex surfaces, but at a high performance cost.	High
Samples	Determines the number of samples taken per pixel within the set radius for AO calculation. More samples yield smoother, more realistic shading at the cost of performance, while fewer samples increase performance but may appear grainier. Available options: • **Samples 2** • **Samples 4** • **Samples 6** • **Samples 8**	High

General Settings

Options overview

Setting	Description	Performance Impact
Direct Lighting Strength	These images show how the Direct Lighting Strength value changes the AO effect depending on whether they are in the shadow or not.	Low
Noise Type	This property defines the type of noise the Ambient Occlusion Master effect uses. Available Options: • **Interleaved Gradient Noise**: Uses interleaved gradient noise to generate static AO. • **Pseudo Random**: Uses pseudo random noise to generate static AO. • **Blue Noise**: Uses a selection of blue noise textures to generate dynamic AO. This creates an animated effect as the texture changes with every frame, as a result the AO effect is more subtle when the camera is in motion.	Low
Blur Mode	This property defines the quality of blur that Unity applies to the AO effect. Higher quality blur creates a smoother, higher fidelity effect but requires more processing power. Available options: • **High** (Bilateral): Bilateral blur, takes three passes to process. • **Medium** (Gaussian): Gaussian blur, takes two passes to process. • **Low** (Kawase): Kawase blur, takes a single pass to process.	Very high

Rendering Settings

Options overview

Setting	Description	Performance Impact
Debug Mode	Enables a view mode that visualizes the Ambient Occlusion effect, helping developers see the AO pass separately from other rendering effects. This is useful for fine-tuning AO settings and understanding its effect on the scene.	High
Render Path	Defines the render path used to calculate the Ambient Occlusion effect. It is important to select a rendering path that matches the one set in the URP Settings Asset to avoid mismatches. The performance impact of this setting depends on the rendering configuration and the application.	Depends on the application
After Opaque	When you enable **After Opaque**, Unity calculates and applies the AO effect after the opaque render pass. This can increase performance when used with Depth as the Source for normal vector values as Unity does not perform the skips depth prepass to calculate AO and instead uses the existing depth values. **After Opaque** can also increase performance on mobile devices that use tile-based rendering.	Medium
Downsample	Selecting this check box reduces the resolution of the Pass that calculates the Ambient Occlusion effect by a factor of two. The reduction in resolution of the Ambient Occlusion Pass by a factor of two reduces the pixel count to process by a factor of four. This reduces the load on the GPU significantly, but makes the effect less detailed.	Very High
Depth Source	Select the source of the normal vector values. The Ambient Occlusion Master Renderer Feature uses normal vectors for calculating how exposed each point on a surface is to ambient lighting. Available options: • **Depth Normals**: AO uses the normal texture generated by the DepthNormals Pass. This option lets Unity make use of a more accurate normal texture. • **Depth**: AO does not use the DepthNormals Pass to generate the normal texture. AO reconstructs the normal vectors using the depth texture instead. Use this option only if you want to avoid using the DepthNormals Pass block in your custom shaders.	Depends on the application

Support and Contact Information

For support and inquiries regarding **ShadowShard - URP Ambient Occlusion Master**, please feel free to reach out through the following channels:

Discord

Join me on Discord for community support, where you can ask questions, share your experiences, and offer suggestions. The invite to the Discord server can be found on the asset store page or within the asset's documentation - **Discord**.

Email

For direct support, you can email me at **shadowshardtools@gmail.com**. I aim to respond as quickly as possible to provide personalized assistance.