



Fake Interior Shader

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1. Important notes

1.a Lit and Unlit

Since the whole effect is a 3D illusion onto a 2D surface and thus the lighting will not consider the inner geometry at all, the lighting calculations used in the Lit variant will not fit in some cases. If Lit is used, sky reflections will automatically be calculated and added. With Unlit it can be manually added with the 'Additional Reflections' variant and a specified cubemap. So the Lit variant is preferred for the ease of use, but in some lighting cases the Unlit variant with custom reflection cubemap and general tweaking will yield better results. If the interior is highly emissive (normal lit interior in a night setting) this is mostly avoided since reflections are not that visible in those lighting conditions.

1.b Why not use cubemaps?

The shader is using 4 different textures to define the texture of the interior. Side walls, back wall, ceiling and floor. With a cubemap you are effectively wasting the window-side of the cubemap because it's never used. And if the left and right wall are the same, one more side is wasted. With separate textures you can also mix and match combinations of interiors better.

Note: If you want two different side wall textures, you can modify the shaders to take in a different texture into the 'ParallaxInterior_CubeTextureSampler'-custom node.

1.c Scale

The shader allows for non cubic interiors by just adjusting the scale of the GameObject, the parallax projection will adjust accordingly. However, the Z scale handles the depth of the interior **in reverse**. This means if you have a Z scale of lower than the X or Y scale, the depth of the interior will be deeper than default, and with a higher Z scale it will be shallower.

1.d Interior plane

The interior plane is used to place texture resembling furniture etc. inside the interior. Since it's just one texture, it will be completely flat and thus need to be a flat projection of the object. Because of how the texture is blended into the interior, the texture needs to be stepp blended in, i.e. on or off, and the threshold is 0.9 of the alpha value in the texture.

1.e Additional Shaders

The main shader is named **FakeInterior_Master** and it contains all features. There are however two additional shaders included. **FakeInterior_Simple** is a very simplified version of **FakeInterior_Master**, it's mainly included to be easier to understand and help you to get started building upon the feature set. Then there is **FakeInterior_Disco** which is a tiled version with animated lights and colors to also show how the shader can be expanded upon.

2. Shader variants

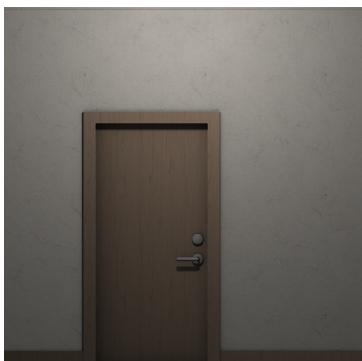
2.a Lightmaps

Because the visuals of the interior are based on just textures and parallax math and thus no real light calculations, there are some inherent limitations on how accurately you can light the interior. The lightmap versions of the shader have a separate texture that lets you explicitly define how the wall/ceiling/floor is lit. The difference is sometimes not very noticeable, but in some cases it's really necessary.

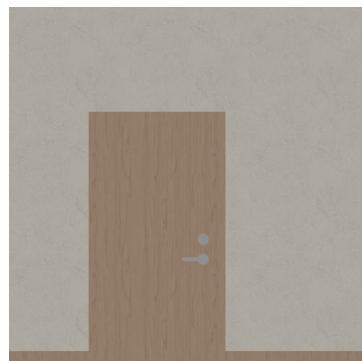
Example: With strong, non-white lights (for example warm incandescent light) the difference is quite noticeable. The left one has not lightmaps but just high emissiveness with a non-white color, while the right one has that emissiveness and non-white color setting applied to only the lightmap texture. (The left one is adjusted to be as close as possible to the right one.)



This is how the textures look



No separate lightmap



Albedo with no light



Lightmap

2.b Alpha Cutout

The alpha cutout variant lets you cut off the sides of the window completely. If the window does not cover the whole wall, this should be used as it reduces the amount of pixels needed to render (even if there is a frame covering the parts of the window not needed).

In URP you need to go into the shader and change ‘Alpha Clip’ in the shader options.

Example:



2.c Additional Reflections

With the Lit shader (PBR in HDRP 7.3) , Unity calculates the reflections based on the skybox and reflection probes in combination with the metallic and smoothness values. This shader provides more options for the reflections. By providing a skybox into the ‘Skybox’ variable and adjusting ‘Base Reflection’ and ‘Edge Reflection’, you can achieve more or less skybox reflections than what Unity’s realistic calculations provide. If you are using both, you should make sure the custom skybox is the same as what Unity calculates by default at that location. When using the Unlit variant, you need to use ‘Additional Reflections’ to get any reflections

2.d Tiled

Because the shader just renders a 3D illusion on a 2D plane, it is very easy to tile the effect and make it even more effective than it already is. The tiled shader variants facilitate all the necessary settings to make it tile over an arbitrary big surface. And with the settings under “Tiling & Tiled Lighting” you can achieve many different semi-random color and light patterns that allow for big skyscraper-like window sides with hundreds of different light effects, randomly scattered.

2.e Flipbook Textures

Flipbook textures allow you to make one big texture with several different texture variants arranged as tiles and then let the shader randomly choose the variant based on the random seed. This is most useful in combination with tiling, letting you have lots of different variation randomly among the tiled interiors. **There is a default way that the texture-tile in the flipbook is selected per interior:** For every interior, one row in the flipbook is selected, then the side walls, back wall, floor and ceiling is randomly selected along the columns of that row.

Note: this behavior is easily modifiable in the ‘FakeInterior_FlipbookRowSelector’ sub-graph.

2.f Flipbook Internal Plane Texture

The flipbook behavior of the internal plane texture works a bit simpler, it just selects one random texture tile out of the flipbook. There is only one internal plane texture with every interior, so no need to sync with others on the same row.

3. Variable descriptions

3.a Base variables

Name	Type	Description
Depth	Float 0..1	Depth of the whole interior
Inner Scale	Float 0..1	Scale of the interior inside
Metallic	Float 0..1	Metallic of the window side
Smoothness	Float 0..1	Smoothness of the window side
Emissive Color	Color	Emissive color of the interior
Emissive Strength	Float	Emissive strength of the interior
Cutout Edges	Vector 4	Left, down, right and up side of the cutout

3.b Outer Wall

With an Inner Scale off less than 1, walls around the interior will fill in between. These properties specify the appearance of those walls.

Outer Wall Texture	Texture	Texture of the wall
Tiling & Offset	UV Settings	Tiling & offset for the texture
Outer Wall Color	Color	Color of the wall
Metallic	Float 0..1	Metallic of the wall
Smoothness	Float 0..1	Smoothness of the wall

3.c Textures

Side Walls	Texture	Left and right wall texture
Back Wall	Texture	Back wall texture
Floor	Texture	Floor texture
Ceiling	Texture	Ceiling texture
Flipbook Size	Vector 2	Tile count in columns and rows of the flipbook

3.d Lightmaps

Side Walls Lightmap	Texture	Left and right wall lightmap
Back Wall Lightmap	Texture	Back wall lightmap
Floor Lightmap	Texture	Floor lightmap
Ceiling Lightmap	Texture	Ceiling lightmap
Lightmap Color	Color	Color of the lightmaps applied to the textures

3.e Interior Plane

Texture	Texture	Texture for the internal plane
Lightmap	Texture	Lightmap for the internal plane
Flipbook Size	Vector 2	Tile count in columns and rows of the flipbook
Plane Depth	Float 0..1	How far into the interior the internal plane is

4.f Glass

Texture	Texture	Glass texture, alpha is used as transparency
Tiling & Offset	UV Settings	Tiling & offset for the texture
Color	Color	Color of the glass
Normal	Texture	Normal map of the glass
Reflection Strength	Float	Normal maps effect strength on the reflections from light outside (only lit version)
Refraction Strength	Float	Normal maps effect strength on the refracting light from inside

4.f Tiling & Tiled Lighting

Tiling & Offset	Vector 4	Tiling & offset for the tiled interiors as a whole
Lightmap Color A	Color	Overrides 'Lightmap Color', combined with B
Lightmap Color B	Color	Overrides 'Lightmap Color', combined with A
Hue Spread	Float	Color spread from A and B, in degrees
Light Steps	Integer	Number of separate light step/levels
Light Range	Vector 2	Range of the light steps/levels
Min Light Value	Float	Minimum light value, help to clamp the low light
Seed	Float	Random seed for the random tiled lightning

4.g Additional Reflections

Skybox	Cubemap	Cubemap for the additional reflections
Base Reflection	Float 0..1	Amount of reflections from any angle
Edge Reflection	Float 0..1	Amount of reflections when viewing from an angle