Billboard & Scrolling Shader Graphs Manual

Table of Contents

Introduction

This asset pack contains both lit and unlit variants of the billboarding and scrolling shader graphs. There are also two slightly more advanced variants of the scrolling texture shader that are used by the water. There are lit and unlit versions of each that support BRP, URP, and HDRP.

There is also a script version of the billboarding shader. This script has some advantages over using the shader graph. One is that if you need the object to have a collider, it will not stay aligned to the object if you use the shader since the shader graph can’t adjust the collider.

What’s Included in This Pack

Billboard and Scrolling Shader Graphs (all supporting BRP, URP, and HDRP):

- Lit Variants
- Unlit Variants
- Water version of the scrolling texture shader that scrolls two textures simultaneously and blends them together.

Sample Materials:

- Billboard Script Material Lit
- Billboard Shader Material Lit
- Billboard Shader Material Unlit
- Black
- Choppy Scrolling Arrows Lit
- Choppy Scrolling Arrows Unlit
- Drainage Ledges
- Grass Lit
- Smooth Scrolling Arrows Lit
- Smooth Scrolling Arrows Unlit
- TiledWall Brown
- Tiles
- Tiles Blue Lit
- Tiles Metallic Lit
- Tiles Trim
- Vertical Scrolling Arrows Lit
- Vertical Scrolling Arrows Unlit
- WallTops
- Water (Flowing)
- Water (Whirlpool)

Scripts:

- The billboard script (`Billboard.cs`)

Sample Scenes:

- One sample scene

Other:

- This manual

How to Use the Billboard Script

The billboard script (`Billboard.cs`) is easy to use and has all the same options as the billboard shader graph. See the Billboard Shader Graphs section for info on them.

To use this script, simply apply it to the object you want to billboard. Configuration is exactly the same as for the shader, although the script is actually simpler since it doesn't have the material options the shader does, such as whether or not its transparent. This is because those options are already on the materials you place on the object, so the script doesn't need them.

Why use this script over the shader?

The advantage here is that if you use the script, then the collider of the object will stay properly aligned with the geometry. This is not so with the shader since it can't adjust the collider.

As with the billboard shader graph, this script does not include certain options of the built in BillboardRenderer component in Unity. However, this doesn't matter as the object you apply this script to will most likely have a mesh renderer, which does have those settings. They include things like the blend probe options, and whether or not the object should cast shadows. As such, the script doesn't need them.

How to Use the Billboard Shader Graphs

These shaders are pretty easy to use. They only have a handful of settings that need to be set.

You may notice that this shader doesn't have some of the options of the built in BillboardRenderer component in Unity. However, this doesn't matter as the object you apply this to will most likely have a mesh renderer, which does have those settings. They include things like the blend probe options, and whether or not the object should cast shadows.

The properties on these shaders are nicely divided into several groups for organization as you can see in the tables below:

Surface Inputs	
This group of options allows you to adjust the appearance of the billboarded object.	
Billboard Type	This allows you to set the type of billboarding behavior: • **Both** – The object will always perfectly face the target object • **Horizontal Only** – The object will only rotate horizontally to face the target • **Vertical Only** – The object will only rotate vertically to face the target
Angle Offsets	This allows you to apply an offset to the final angles calculated for the object. The **X** value is the offset for the horizontal angle, and the **Y** value is the offset for the vertical angle. Both are in degrees. You can use this for example to change which side of the billboarded object always faces the target. Normally, this is the side that faces down the positive **Z** axis.
Main Texture	This is the main texture map for the object.
Normal Map	The normal map for the main texture of the object.

Surface Options	
This group contains some extra options for the object's appearance.	
Smoothness	A value from 0.0 to 1.0 that sets how smooth the surface of the object is.
Metallic	A value from 0.0 to 1.0 that sets how metallic the surface is.
Ambient Occlusion	A value from 0.0 to 1.0 that sets the amount of ambient occlusion

Alpha Clip Threshold	This sets the alpha clipping threshold. If a pixel's alpha value in the main texture map is below this value, then that pixel will be considered completely transparent.

How to Use the Scrolling Shader Graphs

These shaders are again pretty easy to use, with only a few settings that need to be set.

The properties on these shaders are nicely divided into several groups for organization as you can see in the tables below:

Texture Maps	
This group of options allows you to specify the texture maps on the scrolling object.	
Main Texture	The main texture for the object.
Normal Map	The normal map for the main texture of the object.

Configuration	
This group of options allows you to adjust the scrolling behavior of the texture.	
Scroll Speed	This controls how fast the texture will scroll. Negative values will make it scroll in the opposite direction.
Scroll Direction	This controls how much the texture will scroll horizontally and vertically. You may notice that in the sample scenes, the green scrolling arrows are scrolling on the X axis rather than Y even though they are vertical. This is because the arrow texture is horizontal, so that object is rotated 90 degrees to make it vertical.
Scale	This allows you to adjust the horizontal and vertical scaling of the texture.
Offset	This option allows you to change the starting offset of the texture.
Alpha Clip Threshold	Any areas in the texture with an alpha value below this threshold will be made completely transparent.

Choppy Animation	
This completely optional group of options allows you to have the scrolling animate in a choppy style.	
Use Choppy Animation	When this is enabled, the scrolling will use the choppy animation style.
Choppy Animation	This simply sets how often (in seconds) that the animation updates. This

Frequency	option allows you to customize how choppy you want the animation to be. **NOTE:** The **Scroll Speed** option mentioned in a previous table still applies here. Imagine that the texture scrolls at that speed, but the surface only updates as often as this option specifies. That's how this choppy animation works.

Water Shaders

These are just a modified version of the scrolling texture shader. The difference is that this version lets you specific two textures with normal maps. The scrolling of each texture can be separately controlled so they can scroll in different directions and speeds. The two textures are blended together to create the final scrolling image. The water texture you see being used is one I made in Gimp.

While the configuration of these water shaders may look slightly different, the only major difference is that it has two of every setting so each of the two textures can be configured separately. So look at the tables in the How to Use the Scrolling Shader Graphs section above.

NOTE:
The whirlpool effect is just using a second version of the same water material as the streams. However, the whirlpool mesh has its UVs set up in a special way so that the horizontal scroll direction causes the texture to scroll around the whirlpool rather than in just a straight line direction in world space. In other words, the UV map is curved so horizontal texture scrolling follows the curve of the mesh.

Tips & Tricks

The Billboard Shader

1. Billboard an object that uses the scrolling shader

At first this may seem impossible since the billboard shader can’t do the scrolling effect. However, there is a way as you can see in the demo scenes. All you have to do is make an empty game object and add the billboard shader to it. Set it up to your liking, and then make the scrolling object a child of the billboarded object. The empty game object will always face the target, which means its child will as well.

Troubleshooting

The Billboard / Scrolling Shaders

1. The object doesn’t have shadows even though Receive Shadows is on

Make sure you’re using the lit version of the shader graph in question.

2. Scrolling shader doesn’t update when Scroll Speed has certain values

This happens because you’ve inadvertently created a situation where every time the texture updates, it is aligned the same as last time. This is because the texture is moving by some multiple of its own width or height every update, and thus it looks like it didn’t move at all. This makes it appear as if it is not scrolling even though it is. You can see this by doing the same thing with a scrolling shader that isn’t using the choppy animation style. You can see it scrolling in this case because it shows all the in-between positions that we don’t see with the choppy animation cycle. Decreasing the **Choppy Animation Frequency** can also help you get around this this issue.

Known Issues

The Billboard / Scrolling Shaders

None for now.

Credits

I created everything in this asset pack aside from a couple of royalty free textures. This includes the meshes, which I made in Blender.

Textures

While most of the textures in this pack I made myself, there are also a couple of royalty free ones:

- Tiled Wall Texture by TheDigitalArtist (note that I made a gray scale version of this one so I could tint it, but the original is also present)
- Skybox texture by Dimitrios Savva and Jarod Guest