WHAT IS "RETRO SHADERS PRO FOR URP"?

Retro Shaders Pro for URP is a collection of shader effects which emulate the look and feel of retro games. This style is commonly referred to as the "PSX style" due to its similarity to the look and feel of the PS1.

SETUP

Upon installing the pack, all the assets will be contained in the "Retro Shaders Pro" folder. A demo scene is included under "Retro Shaders Pro/Demo", containing some examples of meshes and textures configured to work with the Retro shaders.

Most of the shaders are included inside "Retro Shaders Pro/Shaders", including the terrain and skybox shaders. The post processing assets are included in the "Retro Shaders Pro/Scripts" and "Retro Shaders Pro/Resources" folders.

MESHES

The Retro Lit, Retro Unlit, and Retro Vertex Lit shaders are intended to be used with regular meshes in your scene. To use these shaders, create a regular Material and select one of these Retro shaders from the drop-down menu, then attach the material to your object.

TERRAIN

The Retro Terrain Lit shader may be used for your Unity terrains. To use this shader, create a Material and select the "Retro Shaders Pro/Terrain/Lit" shader from the menu. Then, select your

terrain and assign this material in the Terrain Settings tab on the Terrain component (the option is inside the Basic Terrain foldout). Then, you can paint textures onto your terrain as usual.

SKYBOX

Retro Shaders Pro contains two Skybox shaders.

The *Cubemap* version is similar to the Retro Lit shader, except it takes a Base Cubemap as input. This type of skybox can be attached to a scene via the Lighting tab -> Environment tab -> Skybox Material slot.

The *Procedural* version generates a sky gradient and a cloud pattern which can be dynamically adjusted. This type of skybox does not function correctly with the Skybox Material slot, so it should be attached to a large sphere mesh in your scene. An example of this setup is included in the demo scene.

POST PROCESSING

This shader pack uses **Universal Render Pipeline**'s **ScriptableRenderFeature** functionality for the custom CRT post processing effect. The Unity documentation will outline the basics of URP if you're not familiar with how to create custom renderers.

Please follow these steps to enable an effect in your scene:

- Find your **URP Renderer Asset** and add the effect(s) you wish to use in the **Renderer Features** section at the bottom.
    - This is most commonly found in the Assets/Settings folder if you created a new project using the URP template from the Unity Hub.
    - This asset will be named something like "UniversalRP-HighQuality" (Unity versions 2022.3 and prior) or "PC_RPAsset" (Unity 6) by default.
    - *Retro Shaders Pro* also includes a ready-made asset named "Retro_Renderer" in its root folder, which has the CRT effect pre-added.
- Create a volume profile asset via **Create -> Volume Profile** and add the CRT effect (and any other effects you want to use) to the profile.
- Add a volume to your scene via *GameObject -> Volume* and attach the volume profile.
- Tweak the settings on your volume profile as desired. The CRT effect may require textures to achieve the visuals you desire.

The latest version of this asset was created using Unity 2022.3.0f1 and URP 14.0.7.

USING UNITY 6 (IMPORTANT)

Post processing effects in Unity 6 will eventually require support for **Render Graph**. Non-RG workflows will be deprecated in the future. *Retro Shaders Pro* supports both workflows, although Render Graph support for this asset pack is experimental. It has been tested in Unity 6.0.0.

You can disable Render Graph via *Project Settings -> Graphics -> Pipeline Specific Settings -> URP*. You will find a checkbox to disable Render Graph near the bottom of the window.

ADDITIONAL WARNINGS

These shaders are designed for **linear color space**, so you may encounter issues in gamma space. To swap between color spaces, go to *Project Settings->Player->Other Settings* and find the **Color Space** dropdown option.

Currently, the shaders are designed for the **Forward rendering pipeline**, with Deferred support planned for a later update.

ASSETS INCLUDED

The following assets are included in the asset pack:

VERSION 1.0

RETRO LIT

A PSX-style shader that can be attached to any mesh to instantly give it a classic PS1 aesthetic. The Lit variant applies diffuse lighting from a single directional light source.

This shader uses affine texture mapping for sampling textures (as this was a limitation of the original PS1 hardware), so objects may appear warped when viewing them at extreme angles, or when viewing large triangles.

Surface Options

- **Surface Type** – Toggle between *Opaque* and *Transparent* rendering.
- **Render Face** – Choose whether to render *Front*, *Back*, or *Both* faces.
- **Alpha Clip** – Toggle whether the shader should apply the *Alpha Clip Threshold*.
- **Alpha Clip Threshold** – Pixels with final alpha values below this threshold will be culled (if *Alpha Clip* is enabled).

Retro Properties

- **Base Color** – The albedo color of the object.
- **Base Texture** – An albedo texture to apply more color detail than *Base Color* alone.
- **Resolution Limit** – Sets an upper bound on the resolution of *Base Texture* (will be rounded down to the next power of two)
- **Snaps Per Meter** – The vertices of the mesh will snap to this number of snap points per meter along each axis (in view space, i.e., relative to the camera).
- **Color Depth** – Each color channel is constrained to this many possible values. Low values may darken your image because a floor function is applied.
- **Color Depth Offset** – Applies a slight offset to the colors to avoid the darkening issue.
- **Ambient Light Strength** – Sets a lower bound for how dark the shadowed areas of a mesh may appear.
- **Affine Texture Mapping** – Toggle between affine and perspective-correct mapping.
- **Point Filtering** – Toggle between pixelated point filtering and linear filtering.

RETRO VERTEX LIT

A PSX-style shader like the Retro Lit shader, except lighting is applied in the vertex stage rather than the fragment stage. This is faster but results in lower graphical fidelity on low-poly objects. This kind of lighting was popular in PS1 games!

RETRO UNLIT

A PSX-style shader which has all the features of the Retro Lit shader, except the ability to receive lighting and shadows. All Retro Unlit objects have 100% white ambient lighting applied at all times.

RETRO TERRAIN LIT

This shader applies the PSX-style effect to Unity's built-in terrains. See above for full property descriptions.

- **Resolution Limit**
- **Snaps Per Unit**
- **Color Depth**
- **Color Depth Offset**

RETRO SKYBOX (CUBEMAP)

This skybox shader reads from a cubemap texture and applies it to the scene.

- **Base Color**
- **Base Cubemap** – Instead of a regular texture, the skybox samples a cubemap texture for its albedo.
- **Rotation** – Adjust the orientation of the skybox around the y-axis.
- **Resolution Limit**
- **Color Depth**
- **Color Depth Offset**

RETRO SKYBOX (PROCEDURAL)

This skybox shader generates noise clouds which scroll above the scene, alongside a color gradient.

- **Ground Color** – Skybox color close to the horizon.
- **Sky Color** – Skybox color at the very top of the sky.
- **Color Mix Power** – Lets you configure which of **Ground Color** or **Sky Color** are more strongly mixed in the sky gradient.
- **Cloud Height Threshold** – Controls how far the clouds extend. The first value determines a cutoff point for 0% opacity, and the second value determines at what point the clouds use 100% opacity.
- **Cloud Sizes** – Values used for the noise generator while creating the cloud shapes.
- **Cloud Visibility Threshold** – Controls the amount of cloud that appears. The first value thresholds the generated noise values. The second value controls where the clouds reach 100% opacity.
- **Cloud Color** – Tint applied to the clouds.

- **Cloud Velocity** – How fast the clouds scroll across the sky.
- **Resolution Limit** – Pixelates the noise texture.

CRT

The CRT post processing effect covers the entire screen to make it appear like an old-school CRT TV, complete with distortion effects and RGB subpixels.

- **Show In Scene View** – Tick to apply the CRT effect while in Scene View.
- **Enabled** – Tick to apply the CRT effect.
- **Distortion Strength** – Controls how strongly the edges of the screen warp inwards to form the shape of a CRT glass screen.
- **Background Color** – Color of the areas outside the distorted CRT screen shape.
- **RGB Texture** – Texture to use for the RGB subpixel effect. All pixels on the screen are multiplied by this texture such that the red, green, and blue screen colors appear separate to each other.
    - An example of a texture to use for this is contained in "Retro Shaders Pro/Resources/Textures/RGBTexture.png".
- **RGB Strength** – How strongly the RGB subpixel effect is applied.
- **Scanline Texture** – Texture to use for the scanline effect. All pixels on the screen are multiplied by this texture such that scanlines appear scrolling over the image.
    - An example of a texture to use for this is contained in "Retro Shaders Pro/Resources/Textures/ScanlineTexture.png".
- **Scanline Strength** – How strongly the scanline effect is applied.
- **Scanline Size** – Larger values make the scanlines (and RGB subpixels) appear larger on-screen.
- **Scroll Speed** – How quickly the scanline texture scrolls over the screen.
- **Pixel Size** – An integer value representing how pixelated the image becomes.
- **Aberration Strength** – How strongly chromatic aberration (color channel separation) is applied at the screen edges.
- **Brightness** – Global multiplier for the image colors before some effects are applied. A value of 1 preserves the image as-is.
- **Contrast** – Forces differences in colors to become more obvious. A value of 1 preserves the image as-is.
- **Enable Interlacing** – If true, the effect will only render every odd row of pixels this frame, and then it will render every even row of pixels the following frame, and repeat.

FRAMERATE LIMITER (SCRIPT)

Contained in "Retro Shaders Pro/Scripts", you will find a Framerate Limiter script, which lets you set an FPS upper bound which Unity will aim for. You may find this useful for imitating a poor refresh rate with your game.

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