BEAUTIFY

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Introduction

Thanks for purchasing!

Beautify is a full-screen image processing effect that improves the image quality in real time producing incredibly crisp and vivid scenes.

Beautify uses several intelligent algorithms in a single-pass resulting in a very fast image effect:

- Analyses local pixel contrast, enhancing visual features and producing sharp images.
- Reduces or completely removes banding in gradients, usually seen in sky boxes due to color quantization.
- Adjusts pixel saturation, boosting pixel color without over saturating the image.
- Factory presets or global effect slider, which takes care of all effect details in one step.

In addition to this unique image enhancement technology, Beautify provides state of the art filmic ACES tonemap operator and high quality extra effects which you can combine just enabling them in the inspector. These are high quality effects which are combined in the same render passes providing superior performance.

Beautify is very easy to use, just add the image effect to your camera, choose a preset and that's all.

It works with forward and deferred rendering paths as well as linear and gamma color spaces.

Two shader variants are included, one optimized for speed.

Demo Scenes

A few demo scenes are included to quickly play with the different presets. Just open and play with them to learn about Beautify possibilities.

Quick Start

1. Add the Beautify script to your main camera in your scene.

2. Choose one of the preset and that’s all!

You can of course customize any of its parameters to match your game mood and requirements.

Beautify parameters

General Settings

- **Quality**: chooses the shader variant. The “Best performance” variant uses less texture fetches and includes some extra optimizations which results in a faster performance with less accuracy making it suitable for mobile devices (real performance depends on device GPU power and the number of enabled effects).

- **Preset**: quickly choose a factory combination of values for the parameters below.

- **Compare Mode**: shows a side by side comparison of Beautify effect.

- **Tonemapping**: default is Linear which means no tonemap operator is applied. Choose ACES (Academy Color Encoding System) to map HDR colors into LDR space. Use only with HDR enabled on your camera.

Image Enhancements Options

- **Sharpen**: sharpen intensity. A higher value will produce a dramatic result but can show some undesired artifacts with thin objects or whitish backgrounds. Use the following extra settings to control those artifacts:
    - **Min/Max depth**: allows you to choose the depth range where sharpen will be applied. Decrease max depth to remain skybox untouched. Increase min depth to cause an effect similar to depth of field.
    - **Max Depth**: will compute depth difference around pixels to detect edges. When the depth delta is greater than this value, sharpen will not occur. This will protect thin objects like standalone wires or lines.
    - **Luminance Relaxation**: sharpen is more subtle on high contrasted areas. This parameter tunes this relaxation. Reduce this value to preserve thin edges or bright areas.
    - **Clamp**: irrespective of sharpen intensity or above params, clamp controls the maximum effect applied over a single pixel.
    - **Motion Sensibility**: reduces sharpen effect while camera moves/rotates. This option can reduce flickering and produce a cheap motion blur effect. Set this value to 0 to disable this option.

- **Dither**: dither function shifts pixel RGB values according to a pseudo-random pattern to reduce banding.
    - Min Depth: by default, dither is applied to entire image. Use this parameter to make dithering only occur beyond given depth (set this value near 0.99 to make it only affect sky).

Color Grading Options

- **Vibrance**: controls the intensity of adaptative saturation. This algorithm takes into account current saturation of each pixel, so low saturated pixels receive more importance than high saturated pixels.

- **Tint**: multiplies scene pixels by a given color. Alpha controls the transparency of the tint effect.

- **Daltonize**: similar to vibrance but mostly accentuate primary red, green and blue colors to compensate protanomaly (red deficiency), deuteranomaly (green deficiency) and tritanomaly (blue deficiency). This effect does not shift color hue hence it won't help completely red, green or blue color blindness. The effect will vary depending on each subject so this effect should be enabled on user demand..

- **Contrast** & **Brightness**: these two paramters adds a final contrast + brightness adjustment to the image.

Lens & Lighting Effects

This section contains several optional visual effects related to lens or light. All of them are optional meaning that if disabled they won't make the shader slower. You can also combine many of them to create very nifty results!

- **Bloom**: produces fringes of light extending from the borders of bright areas, contributing to the illusion of an extremely bright light overwhelming the camera or eye capturing the scene. Use intensity and threshold (light sensibility) to adjust bloom effect.

- **Anamorphic Flares**: also known as JJ Abrams flares, they add a sci-fi look to the scene. This effect is only available for Best Quality settings. It's similar to bloom

but also can be assigned a tint color (use alpha to blend between original and tint color) and an orientation (horizontal or vertical).

- **Lens Dirt**: adds dust and dirt effect to your camera when looking to a light source. You can control the intensity and the brightness threshold (brightness sensibility). If you want to use different dirt textures, just assign your own texture into the Dirt Texture slot (several textures are provided in this asset inside the Textures folder).

- **Depth of Field with Bokeh**: depth of field is the distance between the nearest and the furthest objects giving a focused image. Enable this option to produce a photography effect where the target object remains focused while the the backgorund and foreground looks blurred.

    - **Autofocus / Focus target / Focus distance:** allows you to specify where is the focus plane. For autofocus it's recommended to reduce the focus speed as it will produce a more pleasant effect between changes.
    - **Focus speed**: the speed between current focus and a focus change. For example, if the target focus is moving a focus speed of 1 will update the focus instantly whereas a lower value will make the focus more progressive.
    - **Focal Length and Aperture:** these two parameters are used to simulate the virtual camera. Focal Lenth is the distance between the lens and the image sensor. Aperture is referred to the effective apertura or diameter of the pupil through which the outside light enters.
    - **Foreground Blur:** enable to allow foreground objects to be blurred. Use offset to adjust the foreground blur distance.
    - **Downsampling**: reduces the screen buffer size to improve performance. Can produce some artifacts.
    - **Sample count**: referes to the maximum samples that will be gathered. The algorithm is optimized to produce adequate results with a value of 4. A lower value will be faster but the results will look incorrect. A greater value will increase the quality of the blur, which can be appreciated when using a higher focal length value.

- **Eye Adaptation**: simulates eye reaction to quick luminance changes in the scene. You can customize the eye adaptation to light or to dark, either min/max exposure changes and adaptation speeds.

- **Purkinje**: this effect simulates the achromatic vision in the dark plus a spectrum shift to blue tones. You can customize the shift amount and the effect luminance threshold.

Artistic Choices

This section contains additional nice effects that add a touch to your scene. All of them are optional meaning that if disabled they won't make the shader slower. You can also combine many of them to create complex results!

- **Vignetting**: darkens or tints with a custom color the border of the scene. The alpha component controls the effect intensity. This effect can be combined with Night Vision or others to add great depth and special feeling to your scene.

- **Frame**: adds a white or colored border to the screen. The alpha component controls the size of the border.

- **Outline**: adds a white or colored border around objetcts in the scene. The alpha component controls the edge detection threshold.

- **Sepia**: creates a classic sepia color effect! Simple but elegant.

- **Night Vision**: the night vision effect will allow you to see in complete dark. You can customize the color (greenish by default) and the luminance using the alpha component of the color picker. This effect is completed by noise and scan line effect. Works great with vignetting enabled (set a black vignette with an alpha of 32).

- **Thermal Vision**: this effect is similar to night vision but just shift color hues to simulate termal sensitivity. It also distorts the image to give the impression of temperature. This effect is also completed with noise and scan lines.

FAQ (Frequent Asked Questions)

Can Beautify work with other image effects?

Yes – however you need to experiment with image effects order. Beautify works better after Antialias as it can remove the extra blur it can add (especially FXAA).

Skybox banding is not completely removed. What can I do?

Enable HDR in your camera to improve dithering effect and banding removal.

What differences exist between the Best Performance and Quality settings?

Beautify includes two main shader variants – one for desktop with all the goodies and best algorithms and one for mobile.

The mobile version (Best Performance) has reduced quality across the shader. It's a little bit less accuarate with regards to the sharpen effect although unnoticieable. Bloom and anamorphic flares is simplified in this mode.

Depth of Field effect has its own performance options, since this is a very complex effect. Irrespective of desktop or mobile setting, ensure you set the appropiate downsampling and sample count.

When I launch a build, it takes lot of time to complete. What can I do?

Bautify shaders make use of multi_compile options to ensure only the useful code in shaders are included. Multi_compile are directives that are included in the .shader files that make the compiler create different variants for each shader, mixing different shader options in each variant. This way, when you enable one option or another (eg. outline, night vision, …) Unity will pick up the appropiate variant which has optimized code for that combination of features.

To reduce the build time, just open the Build Options section and disable the effects you are not interested to include in your build. Disabled effects in this section won't

be available in the shader (the shader itself is modified) so Unity does not have to generate those variants hence reducing build time and resulting binary size.

(Check out our Shader Control asset to manage the shader keywords in your project)

Can I exclude my UI from Beautify?

Yes, you need to edit Beautify.cs script and add [ImageEffectOpaque] just before the method OnRenderImage, so it reads:

```
[ImageEffectOpaque]
void OnRenderImage(…)
```

I get shader error on Playstation 4!

Use the High Quality setting mode and remove BeautifyMobile.shader from Beautify/Resources/Shaders folder.

I get shader error on Xbox One!

This error occur because the shader compiler provided with XBox DevKit only accepts Windows file encondings. To solve this issue, create a new text file per each file found in Beautify/Resources/Shaders folder and copy/past the contents, replacing the old files with the new ones.

Support

Please visit kronnect.com for questions, support and more info.