SToon

Short introduction

April 14, 2019

1 Typical scene render

As a first step, we should enable the using of SToon shaders. To do this, go to Render – Scene Options and choose as the scene render Cycles Renderer

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We should do this by the following reason. In the SToon addon, an event is called before the rendering of each frame begins. In this event all shaders of all materials of the scene are enumerated and some of them equiped with data about the sources of light in the scene. In order to avoid this enumeration when rendering by another renderer, the addon looks at which renderer is set as the main renderer of the scene. If it is **Cycles Renderer**, then the enumeration will occur. In other cases, no.

Next we should turn on the support of osl-shaders. It is because the SToon shading system is based on them. To do this, go to the render settings and in the Performance tab choose the value Shading System equal to OSL.

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Sampling Light Paths Film Color Management Background			
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O Tile Order Center			
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O Use Spatial Split			
O Use Hair BVH			
O BVH Time 0			
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O Use Camera Cull			
O AO Bounces			
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O Use AVX2			
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O Displacement Both Displacement			
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O Use Progressive			
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Now let's render. Suppose we have a scene with the Eiffel Tower, flat land and one directional light source.



By the way, the SToon system supports only two types of light sources: Point Light and Directional Light. They must be light sources for Cycles. The rest are simply ignored.

Go to the render settings and in the tab **Background** turn off the transparency and set the gray color as the background.

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Assign a material with a Emission shader to the tower. Add a node SToon EasyToon and connect it to the node Emission. Set the parameters Cells and Specular Size equal to 0.

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Assign to the plane material with a shader Emission and render.



It's bad, isn't it? It is necessary to improve it a bit. First add a shadows. To do this, add a node SToon Scene Shadow to the material of the plane, connect it to the node Emission. The output of the Emission mix with an output of a Transparent by the mask from the node SToon Scene Shadow.

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A shadow appeared, but it is black. Add some colors. Press

Property - SToon - Add SToon Global Property

and in the window that appears, set the dark blue color for the parameter Background Color.





It's better. Now make the light source yellow. To do this, select it, press

Property - SToon - Add STooon Light Property

and in the window that appears, set the yellow color for the parameter Light Color.





Finally add the most important element of the cartoon render – the outline strokes. To do this, add a node SToon LineArt Deterministic to the tower material. Set the parameter Size equal to 0.5, and the parameter Normal Limit equal to 0.3. Mix output with the output of the node SToon EasyToon with a factor of 0.8.

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2 Using low-level shaders

In general, the universal node for shading is SToon EasyToon. However, there are several lower-level nodes from which something more specific can be assembled. Any shading consists of three components: shadows, highlights and actual shading (the color of the object, depending on what is illuminated by the light source and what is not). There are three nodes for shadows

SToon Directional Shadow, SToon Point Shadow and SToon Scene Shadow.

Three nodes for highlights:

SToon Directional Specular, SToon Point Specular and SToon Scene Specular.

Three nodes for shading:

SToon Directional Shading, SToon Point Shading and SToon Scene Shading.

The differences between three nodes in each family is what kind of light sources are used. Nodes whose names contains Scene use light sources directly from the scene. These nodes equiped by some kind of data before each frame is rendered. Nodes whose names contains Point calculating effects for point light sources, and those in the name of which are Directional – for directed lights. Moreover, in the last two cases any object can be light sources, since they only require a position in space. To set the properties of light sources for using in nodes of the type Scene, it is necessary to add the SToon Light property to each of them. If this property is not present, then the parameters of the light source are considered standard.

Let's go to practice. Suppose we have a scene with a ball in the plane and one null. This null will a light source.



To the plane and the ball assign a material with a shader Emission. Add a node SToon Point Shadow. The output is pass through ColorRamp and connect to Color port of the Emission node. To set the source location, we use a node CombineXYZ, to the values of which we simply drag the global position of the null.



Render and see that shadow zones are black and lighted zones are white.



For node SToon Directional Shadow the effect is the same. Instead of Position parameter it is necessary to set the parameter Direction. This parameter is essentially the same location of the light source in space, and its direction is then calculated as the direction to the center of the scene.

For highlights, add a node SToon Point Specular. The result.



For shading use a node SToon Point Shading.



Parameter Radius of this node determines how far the light travels from the center of the light source. There is no limit of the radius for the node SToon Directional Shading.



Now let's put it all together. First the shadows on the plane. It is simple: draw dark-blue color inside a shadow, and draw nothing by using **Transparent** in other places.



Next mix highlights and shading on the ball.

