Unreal Cel Shading Tutorial

This is not intended to be the definitive guide for the Unreal cel shader but more to show the basics to get people going in the right direction, because there really isn't any English documentation at all. I also don't really (never) write tutorials so I apologize profusely for anything (probably lots) not covered. Oh yeah, and the grammatical errors might come quick and often so fasten your seatbelt J Also, I intend to keep building, editing and adding content to the tutorial with many examples of settings and effects. Time permitting, I also inted to go into post process techniques to further give your cel shading a hand drawn look. That's why I'm going to post this as an interactive tutorial to give people a place to post questions and spark discussion, and also to post any tips and tricks they have picked up while using the shader.

I have been using the Unreal shader since it's early beginning, back when it did little more than mimic Super Cel Shader with a few bonuses. It's much more complicated than it used to be, so much so that I haven't even gotten to most of the new features put into the plugin. Right now though, after having used Super Cel Shader, BESM, and Unreal, I can say without a doubt that Unreal is hands down the best cel shader out there right now.

A little bit about the differences:

Super Cel Shader:

Comes with Lightwave

Strengths: The simplest cel shader to work with because it hasn't been updated in like forever. You can get good results with it and it works well with textures.

Weaknesses: It's really limiting in that there is not much you can do with the color zones. Pick a color, set a fill size and that's about it.

BESM:

Comes with Lightwave

Example of the BESM shader(All examples are my own original copyrighted works, except Batman, modeled by loganarts):

http://ecreativityworks.com/gallery...arine2mask.html

Strengths: The methods of color choosing and zone parameters are the easiest to use and sport the most intuitive interface of the cel shaders. BESM handles gradients very well. Could alter the transparency and density of color easily.

Weaknesses: It takes a different approach to filling zones, basically overriding the surface color setting in favor of it's own. Because of this texture use is difficult. You can use textures with BESM but only by turning the force color way down, which also increases the transparency of the color zone. BESM uses a incidence angle approach to drawing the ink lines which created a nice thin/think organic look to the lines, great for stills, but unfortunately this approach often creates lines that don't follow through very well on moving objects unless the thickness is turned way down. BESM does not handle colored lighting well at all, because of the color zones tendency to override everything.

Unreal:

http://webclub.kcom.ne.jp/mb/dhm/

Examples of the Unreal Shader:

http://ecreativityworks.com/wips/agenthead.html http://ecreativityworks.com/wips/nina2.html

http://lwg3d.org/forums/showthread.php?s=&threadid=8816 Strengths: Options galore; you can achieve just about any cel effect possible. It offers true color transparency while maintaining solid ink lines, a feature previously only available by a separate plugin. It reacts to colored lighting extremely well, albeit the effect is softer than I would like. It is the best cel shader at working with textures, having the most options available to blend the texture with the color. The paint map is an awesome feature and allows for some effects that simply are not possible in the other shader programs. It's also the only package that allows the user to render the ink lines to a separate alpha channel. It's also the only cel plugin that uses radiosity to compute light and shadows.

Weaknesses: The package could be better integrated now that so many additional features have been added. The menu interface is becoming cumbersome, and downright counter intuitive. This is also the only package that uses it's own antialiasing for it's ink lines and draws them as an image filter after the picture is rendered. Most of the time this is ok but this method needs to be optional. English documentation missing!!!

In the end, don't be afraid to try out each plugin and draw your own conclusions. Also, don't be afraid to try multiple cel plugins on the same object. I've used Unreal and BESM on the same object with success.

Generally speaking, you should keep the ink zones to 2 or 3, 4 zones max. 2 zones are generally best in appearance for characters, because it keeps the characters simple with easy readability. 3 zones can be good for environments because it increases the 'production value' of the look if done right.

General Tips:

1. The dominance of the ink zones can also be controlled by adjusting the diffuse channel

2. The less lights the better. The color zones don't react very well to a lot of lights, and you will often lose definition of the form.

3. Experiment with the paint map feature. Blurring the source photo gives the texture a softer transition. Also try hand painting a soft color map with gradual color shifts to help gain a more painted look.

4. When modeling for cel shading, less is more. Don't

model realistic for characters, especially the face, as it usually does not translate that well. I often skip modeling things such as nostrils and eyelashes.

5. When controlling ink lines, it's important to give each surface border a unique name to get the ink line to fall where expected. And to this end, make sure to shape the polys to follow the form of how you want the color zones to look (without detriment to model deformation of course). Okay, lets look at the first picture and follow the numerals on it.

The Base Tab



1. This is the area that controls each ink zone and the percentage of fill versus another zone. This can also be fine tuned using the diffuse channel. The slider bars underneath the color bar give a rough approximation of percentage of fill, but this is not totally accurate and you still need to test render to see the true result. You can also set a gradient between fills to smooth out the edges.

2. The min, max and brightness all pretty much function like Super Cel Shader, Lightwaves default cel renderer. You can enter numerics or simply drag the sliders.

3. The color mixer takes the base color, another color and 'mixes' the two to form a new color, and there are different ways to do this.

4. You can delete or add additional color zones from this tab

5. The group ID defines which surfaces use which set of ink line settings, used in conjunction with the toon tracer component of the plugin.

6. This sets how much of the mesh is see through. This is not the same as transparency. The mesh still looks solid, but the ink lines of unseen portions of the model are drawn through the surface. This is good for things like having eyebrows seen through hair.

The Specularity Tab:

The specular tab in Lightwaves surfaces setting controls the specular highlight. The specular tab in the Unreal shader only determines how it will look.

1. This controls the size of the specular highlight, and can



be used in conjunction with specular setting of the surface editor.

2.max determines the size of the specular highlight, and bright determines how bright the highlight will be. In addition to this setting, you can also use color to control the level of brightness.

3. This how the specular highlight will render. While Lightwave and Cel specular will render out a circular highlight, the Anisotropy options render highlights in a more organic manner with curves that follow the form of the object much more closely.

PaintMap tab:



The paintmap tab is a unique way to add texture to the character through the use of image maps (Note to creator: being able to add multiple paintmaps and blend between them would be awesome! It would also be nice to have more precise control over how the map stretches).

1.You can select any map and it stretches and tiles over the object creating a pretty loose pattern. The shift parameter controls how the tiling and stretching occur. Smaller values produce wider stretching. We'll get to the alpha transparency later. 2.In the output channel, you can have the image map become part of the surface color or simply affect the diffuse channel, which then takes the image map and applies it to the borders of the color zones. The mode pull down tab functions much like the surface editor as far being able to add or multiply the intensity of the image map.

Image map used for paint map Image map applied as a paint map to the surface



Image map applied as a paint map only to the diffuse



channel Expansion Tab



I haven't really messed around with this much with the exception of the radiosity settings. More info on the other stuff to come. The radiosity setting uses different settings



to compute the color zones and shadows, and each one has its subtle differences. It's best to experiment with this one but I'll show some examples soon.

ToonTracer

This is how the ink lines are drawn for the object and

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ToonTracer is a beast all to itself. I will go more into detail about the various settings later but for now I'll hit the basics.

1. This is the region that affects the size and appearance of the ink lines. I really haven't found much need to mess these settings other than the pen size. Spacing creates, well, space between the lines at certain intervals. Pushing it to the max settings creates dotted lines. The angle setting creates the thin/thick style of lines but it doesn't seem to alias well. You can also select square or round pixels as the basis for the drawn lines, but the round pixels again look soft and don't seem to alias well until you get to higher pen sizes.

2. These settings determine whether the ink lines will be drawn over the whole object and/or the surface borders.

3.Controls the group ID's. You can turn them on or off here. You can also add layers and create separate ink line settings that govern different surface groups

4.Lists the surfaces and the groups that are controlled by them.

Hopefully this should give you a grasp of the basics and where you could take it!

Q&A

• hmm, i cant seem to find where i add an outline to the shape. Where is this option?

You need to add the pixel filter and play with that. In the Scenes Tab, under Special Processing

• how do i load the pixel filter and what filter do i load?

Should be in there along with the other Unreal plug-ins when you load them into Layout