e's Talking About Textures... Again?!

Hello again, and welcome back to From Another Perspective, the 3D column. This month we're going to be talking more about textures. It can not be overstated that textures are what make a 3D project look like something other than that which can be generated by a computer. It would be safe to say that a major factor in creating nice-looking 3D renderings or animations involves your use of textures.

This month we're back in Studio Pro, focusing on an exciting new release from Strata called Power Module 2. Power Module 2 brings powerful new shading capabilities to Studio Pro's already excellent surface texturing. It's the next in the set of Power Modules being developed for Studio Pro, and let me be the first to tell you this set of tools is a must-have. Strata's website is located at http://www.strata3d.com/ for more information.

uh?

We've spent a little time so far talking about things like reflection maps and other kinds of "texture maps." Remembering that our maps are really bit-mapped pictures wrapped around models or used as backdrops or backgrounds for our images, think of what a bit-mapped image is: it's essentially a grid comprised of a whole bunch of dots, or pixels, that forms an image. No real stretch so far, right? Imagine zooming in on that bit-mapped image in Photoshop at 1600%. What do you get? A bunch of strange-colored squares that look nothing like the picture at its original size. The reason for this is that your bit-mapped image is "resolution dependent." That is to say, the resolution of the image plays a key role in how large you can stretch it before the illusion that your texture is really

just a bitmap is shattered. Bear with me here. This is pretty exciting stuff.

he Low-Down on Procedurals

While texture maps are extremely important in your 3D work, sometimes you'll want to use other methods of applying textures to your 3D projects. One of these methods is called a "Procedural Texture." A procedural texture is essentially a texture, or "shader," or "surface" that relies on mathematical equations to create it, rather than bit-mapped image. This is not to say that a procedural can not contain a bit-mapped image in one of its channels. It may or may not, but the heart and sole of a "procedural" texture is the equation that creates it.

o What?

One of the reasons procedurals are so important has to do with scale. Consider for a moment the scene below:

hy, it's a simple space ship against a star field (one of Power Module 2's built in capabilities). The starfield behind the ship was created as a procedural background. The reason this is important is multi-fold. For starters, I didn't have to import a large texture map and wrap it around the inside of a sphere, the old-fashioned (and still widely used) method of doing something like this. This saves application "overhead" (as in RAM) and frees up resources to do something else besides keep track of a big image map.

Power Module 2 now has a nebulae and starfield generator that mathematically calculates this background, and (this is the important part) it doesn't matter what resolution you render at. Not only does this save you the time and trouble of hunting down space shots, but it allows you to create custom, unique and resolution-independent backgrounds for your space scenes. The other nifty part about Power Module 2's starfield/nebulae generator is that it is animatable. You may wish to have stars twinkle and explode, or change colors. Nebula can pulse and shift, and other "real world" space-type effects can be created on your own. This means that as the ship slowly moves past the camera during an animation, your space behind seems alive.

Perhaps the biggest reason I like procedural textures is that they are almost entirely resolution independent. This means that I can create a procedural starfield and freely move within my 3D space without worrying about getting too close to a texture-mapped sphere. This would (sort of) be the equivalent of zooming into our bit-mapped image in Photoshop and exposing what looks like a starfield image from far away as the map of dots that it really is. Procedurals, because they're created mathematically, will zoom with you and re-adjust themselves accordingly.

Sure, this is the most basic of explanations, but hopefully you get the idea.

hat About My Models?

What about applying procedural textures to objects? This is where procedurals can really shine. One of the hardest parts of a technique called bump-mapping is getting the right resolution map wrapped around the object and aligned properly. Most of the time this involves a lot of back and forth between Photoshop and your 3D application, adjusting, trimming and retouching the map. The tricky part is: use too low a resolution and when you zoom in on your object the illusion falls apart. Use too high a resolution and you're using valuable application/system resources that may prevent you from completing your rendering any time this century. Many times there's no way around this.

But, imagine if you could create a map with an equation that, no matter how far or how close you moved to your object, the integrity of the "texture" remained intact. This is the effect of a procedural. Add to this the ability of the procedural to create a more random and less predictable pattern, and you have a truly powerful addition to the already powerful surfacing

capabilities of Studio Pro. If you scroll up to look at the space ship image, the distant moon to the upper left employs Power Module 2's new 3D "Moon Scape" texture. During this animation, if I were to zoom in closer on that moon, the texture would hold up because it would be re-calculated for the new view, rather than taking our grid of pixels and stretching them. Get it?

orth the Price of Admission?

isplacement mapping is another feature offered by Power Module 2. This is an extremely powerful and valuable addition to Studio Pro. Going back to our bump mapping term for a moment, remember that a bump map only creates the illusion of undulations and "bumps" in your objects. It doesn't actually change the topology of the object (its geometry). The object actually remains flat. While this is fine for many uses, it'll only get you so far. Displacement mapping takes the bump effect to the next level by actually distorting the vertices of your geometry. This effect no longer requires a resolution-dependent map to create the illusion. It actually will make bumps and waves in your models.

Corrosion is another powerful addition. It degrades that "perfect" quality so many computer-generated objects have and makes them look more "real." Though this is only a 2D texture, it has the ability to dramatically affect the surface integrity of a model.

onclusion

Add to these features some fun wildlife textures that simulate patterns of cheetahs, giraffes, jaguars and leopards, some layered rock (I wondered when a company called Strata would release a feature that allowed you to produce your own "stratas" — see just above for an example), procedural brick and a powerful new UV Burner — a feature that allows you to alter the coordinates of an object's surface normals — and you have vastly improved power in Strata's surfacing capabilities, bringing it up to a par with (or beyond) other major 3D applications. If you use Strata Studio Pro 2.5.3, don't just strongly consider this upgrade. Get on the phone and buy it right now. You'll be up all night trying out things you've always wondered if you could do. Strata just made it easier. And don't forget to tell them that John sent you!

John B. Crane

jbcrane@applewizards.net

http://applewizards.net/