



The fog helper has a useful color field that adds atmosphere to your model whilst also lessening those render times

(animating the resizing of the model and map will make it look like a throbbing light!).

### A cautionary tale

Make sure your CosmoPlayer (or whichever plug-in you're using) settings are correct. The "Nice Transparency" checkbox needs to be checked, otherwise you won't see anything! This is an option you can manually add to the navigational information of your .wrl file; (unfortunately not all VRML 2.0 node functions are supported in MAX). Or, if the code frightens you too much (I totally understand that) just make sure your users are aware of the setting checkbox (help files are always useful even if it's just navigation aids).

### Making it fast

Nothing makes your VRML world crawl more than having multiple animations all running immediately the user enters your world. Simply using proximity sensors to fire off your animations only when they need to be animating (such as when the user is able to see them) will vastly improve load times.

Use Proximity Sensors and LODs liberally in your world. Just use them intelligently - as a user approaches point (a) have an animation start in area (d) where they are most likely to come across next. There is little excuse for making your visitor wait five minutes while something they can't see downloads.

Browsers and VRML plug-ins (such as CosmoPlayer) do a really good job of rendering your VRML world, but ultimately it's just that -

rendering. The browser plug-in has to render everything in the scene. As I mentioned earlier you can vastly increase your download times by breaking up your models into separate entities and then grouping them as one component. This way the render will be much faster, the download time will be much quicker and the processor can work on multiple models at once increasing the eyeball efficiency of your site.

### Lighting

The correct use of lighting in VRML is very important. As you no doubt know, SpotLights take longer to render than PointLights, which take longer to render than DirectionalLights. You should substitute DirectionalLights for PointLights and SpotLights wherever possible within your model. Using ambient lights is OK, but can add vastly to the CPU cycles as an ambient light will light the whole scene. Reducing the ambient intensity field of your lights is preferable but all in all, a better, faster option is the use of spot and directional lights to add illumination to your scene. No ambience, I hear you cry! Ugly spots, harsh lighting!? Surely not?

If you absolutely must have that ambient light effect - another useful helper is Fog. Making your underwater scenes look more believable or making your caverns of doom look, well, 'doomish' use the Fog helper. It has a useful color field that adds atmosphere to your model whilst also lessening those render times. You only see the models as you draw closer - the rest is lost in the fog - see? It also works well at dispersing lights (like fog in MAX).

A real light lifesaver involves using the NavInfo helper. If you uncheck the headlight box you will save yourself quite a bit on potential wasted render time. Mostly because the headlight is unseen if your scene has lights in it, yet the headlight will still get rendered, your user simply won't know it's there.

### JavaScript

A couple of final pointers to make you an all-round VRML-savvy-3D-type person. Load your VRML world at a camera start point inside a building. That way, you can load the inside of the room pretty quickly and while the visitor is wandering around, you can be loading the outside.

Use the <EMBED WIDTH HEIGHT> tag in your HTML document to embed the world in a Web page at a specific size, thus reducing the load time - do you really need your world full-screen? Probably not. Or another popular size determination technique is to use JavaScript to open up a window, this way you have control over the size of the view the user is seeing.

By defining specific window sizes you are able to open up a whole world of creative possibilities. VRML is really worthwhile exploring right now. As computers and networks get faster, and more PCs have 3D cards with OpenGL support, VRML is becoming more of a realistic medium for animators and 3D artists to showcase their work. It's another application of 3D Studio MAX that will enable you to achieve a multimedia and cross-platform output for your work. ■