Live Lecture Chat Window
January 31, 2024

12:19:26 The advantage of bump-mapping over displacement-mapping, is it is faster?

Yes, and doesn't require generating so many vertices.

12:19:44 And the advantage of displacement-mapping is it looks better when you zoom in?

Yes and especially when you try to fly along the surface.

12:19:57 How many questions are on the test?

40

For Project #3, I recommend doing something like this in the vertex shader:

```
vec3 vert = gl_Vertex.xyz;
vert.z = uA * ...
. . .
gl_Position = gl_ModelViewProjectionMatrix * vec4( vert, 1. );
```

12:26:22 So uA, uB, uC and uD are all uniform vars declared at the top of the vert file?

Yes.

12:27:12 If we don't use glman do we have to define those [uKa, uKd, uKs, uShininess] ourselves with a timer or something? Or not required?

You can just hardcode good values for them, like (0.1, 0.6, 0.3, 15.)

12:31:30 So I'm confused about what part of the calculus is in the frag file? or is everything in vert and only the out vec3 in frag?

None of it is in the fragment shader! All the calculus happens in the vertex shader.

12:36:13 Why does RotateNormal come before main( ) ?

So that you don't need a function prototype for it. You *can* put it after main( ), but then you need to provide a function prototype so that, when it is called in main( ), the compiler knows what the calling sequence looks like.

12:37:32 So we are calling this in main() [of the fragment shader]? :

```
vec3 n = RotateNormal( angx, angy, vN );
n = normalize(  gl_NormalMatrix * n  );
```

Yes.

12:43:59 Is cube mapping more efficient than ray tracing?

Yes, very.

12:48:35 How do you handle if multiple components have the same magnitude? Is it a color blend?

In theory, multiple images have the same color at the places they touch each other, so then it wouldn't matter how the hardware breaks the tie.

13:08:24 What are those lines that extend out?

They indicate that glman has picked that object.

13:17:23 Can we use a cubemap we find online?

Definitely! I am anxious to see what you find.

13:19:58 Do they have special equipment for cube mapping like a 360 degree camera or a camera that mechanically turns around?

Yes, there are 360° cameras, like the Garmin VIRB. Also, there is software that will take a lot of photos taken in all directions and stitch them into a 3D sphere.

14:11:49 Is there a macro for ΠT in GLSL?

No, just say something like:

```
const float PI = 3.14159265;
```