Live Lecture Chat Window
October 11, 2023

14:18:28 Can you please explain a little bit more how normal3f works, I mean how do we know if it is front face, right face?

It defines a normal vector (nx,ny,nz) that is perpendicular to the surface. The next time glVertex3f is called, that normal vector is assigned to that vertex, much in the same way that calling glVertex3f assigns the color defined in the most recent call to glColor3f to that vertex. When you fill the 3 glNormal3f values, you just make sure that it goes along with the face you are drawing. For example, in the sample code, when the top face was being drawn, the normal was set to (0.,1.,0.), i.e., up.

14:30:32 Had a quick question about lighting and performance - how computationally expensive is adding extra light sources?

Some, but not grossly. For the types of scenes you will be doing in this class, you probably wouldn't notice the difference.

14:34:53 How to visualize how a normal vector responds to lighting?

You see how the lighting looks on the surface that owns that normal vector.

14:55:42 How do you key-bind specific light colors [in Project 3]?

I did it by having 3 global floats: Red, Green, and Blue, and then assigning them in the Keyboard function when 'r', 'g', 'b', 'y', and 'w' are hit. They then got used in subsequent glColor3f and glMaterial calls.

14:59:04 If a light source shines directly at the direction the surface or vertex normal is facing that spot becomes brightest?

Correct. That is when the angle Θ is equal to 0., which is when the cosine is at a maximum.

15:03:43 And OpenGL interpolates the falloff?

That's right.

15:17:43 Glad I'm not the only one to whom this happens. [This is referring to me trying to run a live unplanned, unrehearsed demo and having VS declare an error that wasn't really there.]

😊

15:24:31 The only reason a shadow becomes lighter or darker is because of the ambient lighting?

That's right! Many people think you do shadows in CG by "painting black". What we really do is light the shadowed pixel with ambient only and don't give it any diffuse or specular lighting, since it can't see the light source.

15:25:24 Quick question about shadows - is it OK if we try and get shadows working for project 3?

Definitely yes. But it is tricky and requires shaders. Get the non-shadowed version of the project running first and get it safely turned in before trying this. Then, if you run out of time, you will still get the grade.

15:26:45 From the file of the horse, how do we get the horse on the xyz plane

If you just say glCallList(HorseList) in Display, you will get a horse at the origin, on the X-Z plane, facing the +X axis.

15:27:55 RenderDoc -- https://renderdoc.org/

[Referring to a way to capture all your OpenGL calls for later. This can be a useful debugging tool. It can also add more confusion and soak up time you don't have. But it is definitely worth knowing about.]

15:29:17 I'm trying the extra credit. Do you have any tips on how to get the horses to be out of phase? so far, I can either get them to be in-phase or I can have them form an Eldrich Horror but no in-between

Great looking Horror Horse! Each of the 4 horses needs to be ¼ of a circle out of phase with the previous horse. In a call that uses degrees, like glRotatef, this would be like adding 90°. In a call that uses radians, like sin or cos, this would be like adding $\pi/2$ radians.

15:38:55 It's okay if we just use glm matrices for these transforms right?

Yes.

15:43:33 I wanted to double check - CarouselHorse0.10.550 should be a .cpp file right? Like it will still compile for grading if we #include CarouselHorse0.5.550.cpp? Or would we just need to submit the horse file with it when we turn in our project

Yes, you can rename it if it feels more intuitive to you. But it is not code, it is a large list of numbers that is being assigned to arrays.

15:45:48 Oh got it! so it really doesn't need a file extension at all then

That's correct. Files that are #included really don't absolutely need an extension.