CSE 167

Discussion 6 ft. Chenlin
11/7/2018

Announcements

- Project 4 is due 11/16 2PM
  - Late grading for Project 4 is extended to 11/30 because of Thanksgiving, but…
- Midterm 2 is on Thurs 11/29

Skybox&Environment mapping

https://learnopengl.com/Advanced-OpenGL/Cubemaps

Environment mapping ref

- Frag shader

```
#version 330 core
out vec4 FragColor;

in vec3 Normal;
in vec3 Position;

uniform vec3 cameraPos;
uniform samplerCube skybox;

void main()
{
    vec3 I = normalize(Position - cameraPos);
    vec3 R = reflect(I, normalize(Normal));
    FragColor = vec4(texture(skybox, R).rgb, 1.0);
}
```

- Vert shader

```
#version 330 core
layout (location = 0) in vec3 aPos;
layout (location = 1) in vec3 aNormal;

out vec3 Normal;
out vec3 Position;

uniform mat4 model;  uniform mat4 view;  uniform mat4
projection;

void main()
{
    Normal = mat3(transpose(inverse(model))) * aNormal;
    Position = vec3(model * vec4(aPos, 1.0));
    gl_Position = projection * view * model * vec4(aPos, 1.0);
}
```

Environment mapping

- So how do I send this information: **uniform** samplerCube skybox;
- You already created skybox somewhere in your code and have this line somewhere: skybox_id = loadCubemap();
- All you need to do is bind the texture in draw method
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```
glBindVertexArray(cubeVAO);
glBindTexture(GL_TEXTURE_CUBE_MAP, skybox_id);
glDrawArrays(GL_TRIANGLES, 0, vertices.size());
```