Name : Sanketh Karuturi

Email ID: karutusa@oregonstate.edu

CS 450

Introduction to Computer Graphics

Project #6

Shaders

1) A description of what you did to get the display you got

In this project, my goal was to create an animated ellipse pattern using OpenGL fragment shaders. To achieve this, I primarily focused on two aspects: the graphical rendering of the ellipse and implementing keytime and time-equation-based animations.

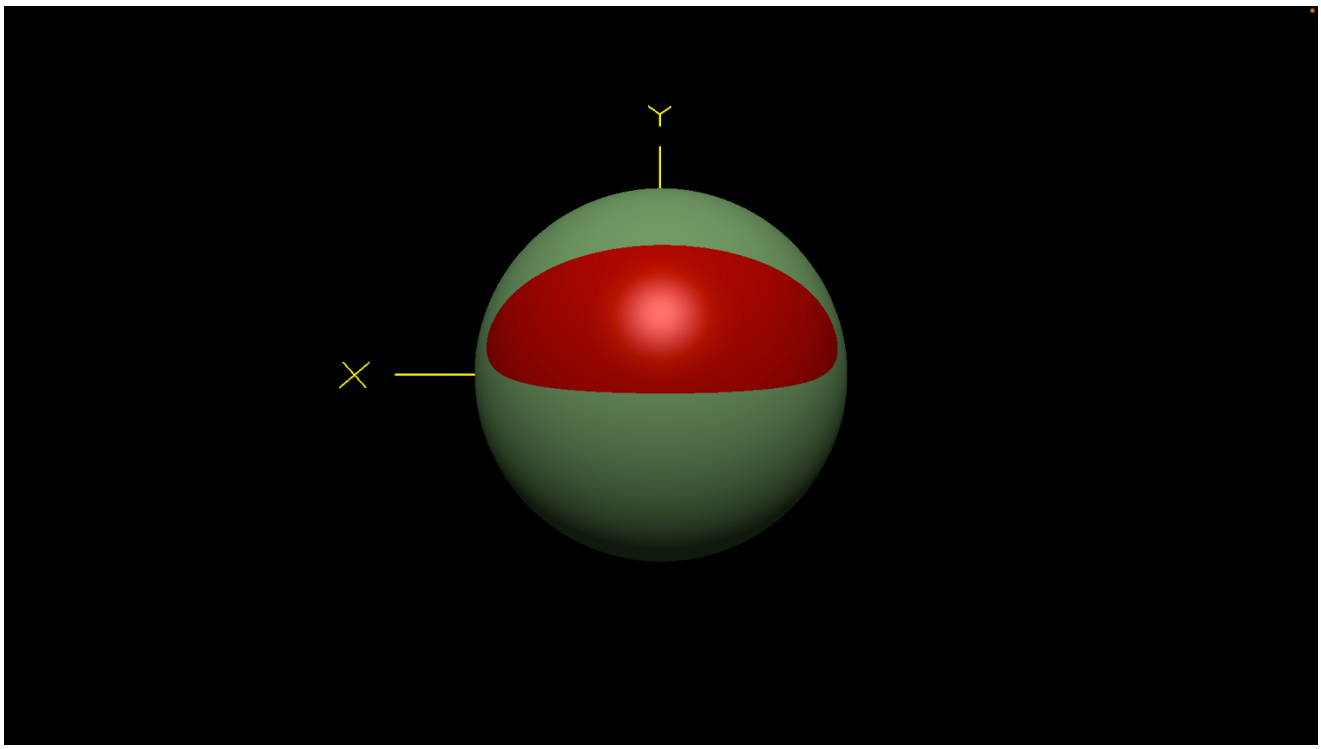
Key Implementations:

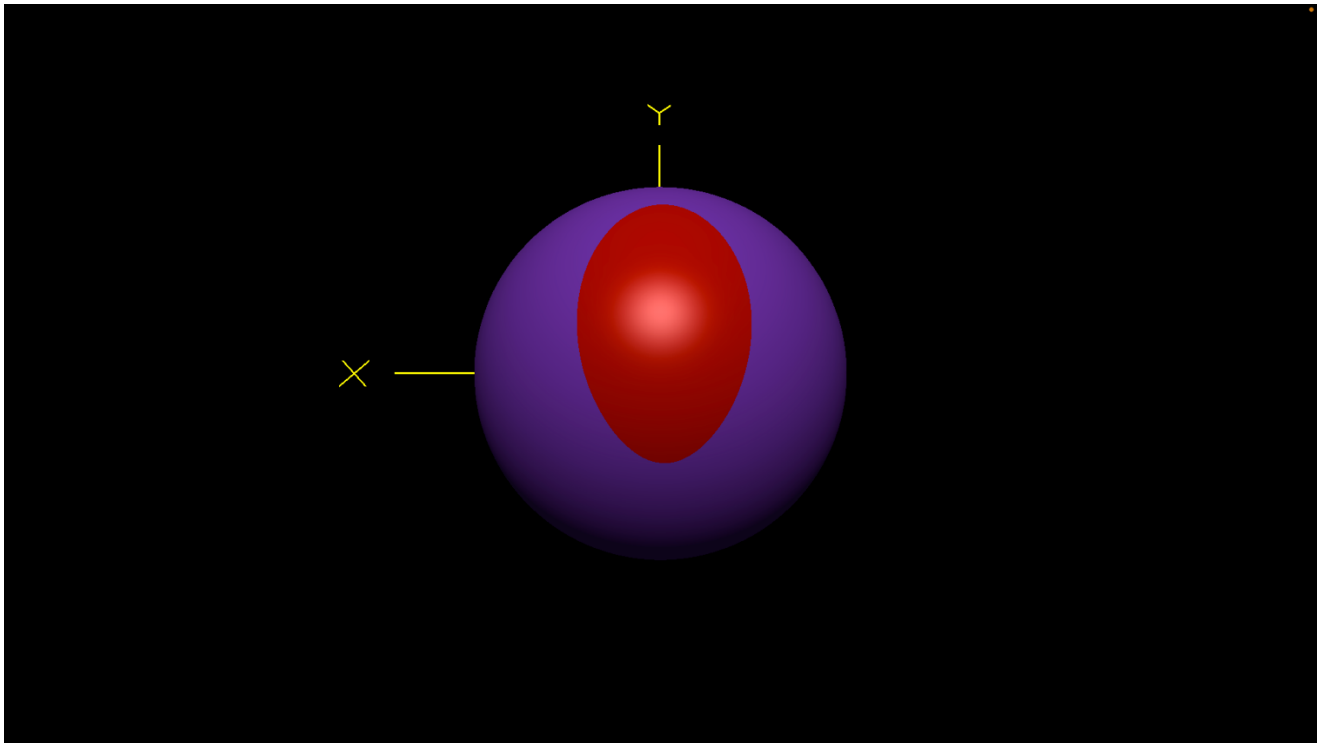
1. **Shader Program Setup:** Utilized GLSLProgram class for compiling and linking the vertex (**pattern.vert**) and fragment (**pattern.frag**) shaders. This setup was crucial for implementing custom graphics effects.
2. **Ellipse Rendering:** Implemented the logic in the fragment shader to draw an ellipse pattern based on texture coordinates and ellipse equations.
3. **Keytime Animation:** Used the **Keytimes** class to animate the ellipse's center. I programmed keytime values to change the ellipse center (**uSc** and **uTc**) over time.
4. **Time-Equation Animation:** Incorporated time-based animations for ellipse radii (**uRs** and **uRt**) using sine and cosine functions, which made the ellipse dynamically change its shape.
5. **Per-Fragment Lighting:** Added code in the fragment shader for per-fragment lighting, considering ambient, diffuse, and specular light components to enhance the visual appeal.

2) Keytime Values for uSc and uTc

Time Value	uSc	uTc
0.0	1.0	1.0
0.6	0.4	0.4
2.2	0.8	0.8
6.0	0.6	0.6
9.0	0.8	0.8
12.0	1.0	1.0

3) A cool-looking screen shot from your program





4) Assessment of Animation

The animation in my project convincingly meets the set objectives due to the following observations:

- **Dynamic Changes:** The ellipse pattern correctly changes its position and shape over time, reflecting the keytime and time-based animations.
- **Visual Verification:** The pattern and its animations are visually consistent with the intended design, displaying smooth transitions and accurate ellipse shapes.
- **Lighting Effects:** The per-fragment lighting successfully adds depth and realism to the pattern, enhancing the overall visual experience.

5) Media Link : https://media.oregonstate.edu/media/t/1_dvhuwxkk