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Prof. Jack Tumblin

COMP_SCI 351

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Project C: Matte Dinosaur and Shiny Snowman

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Goals:

This project aims to demonstrate a variety of lighting and material. It focuses on the impacts of using the Vertex Shader as opposed to the Fragment Shader. The sphere at the center demonstrates the different kinds of lighting and shading. The other objects use Phong shading but respond to changes in lighting.

** Note: I made this on a larger monitor so apologies if there is scrolling!

User's Guide:

- WASD keys move the camera without turning it. W/D keys move the camera forward and backwards in the direction of the gaze; A/D keys strafe the camera left and right at the current altitude.
- Arrow keys aim the camera without moving it. Up/down arrow keys tilt the camera up and down; left/right arrow keys rotate the camera left and right.
- The buttons above the horizontal line toggle the shading and lighting. Click to hide/show the Gouraud and Phong shading, and click to activate Phong lighting or Blinn-Phong lighting. As a default, this shows Gouraud shading with Phong lighting.
- Note that all objects besides the central spinning sphere all use Phong shading.

- Below the horizontal line, input values for the location of the light as well as the RGB values for the ambient, diffuse, and specular terms. Click the “Light on/off” button to remove all lighting. Once the light is turned on again, it will reset to its default.

Results:

Figure 1: Phong Shading and Blinn-Phong Lighting on a light with increased red ambient.

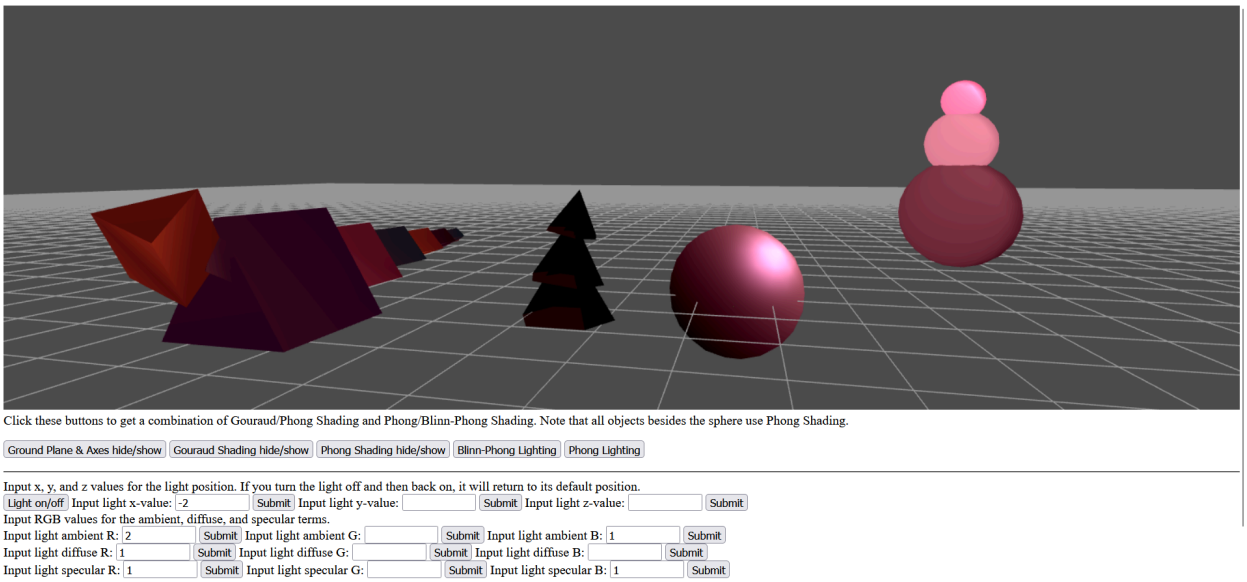


Figure 2: A different light position.

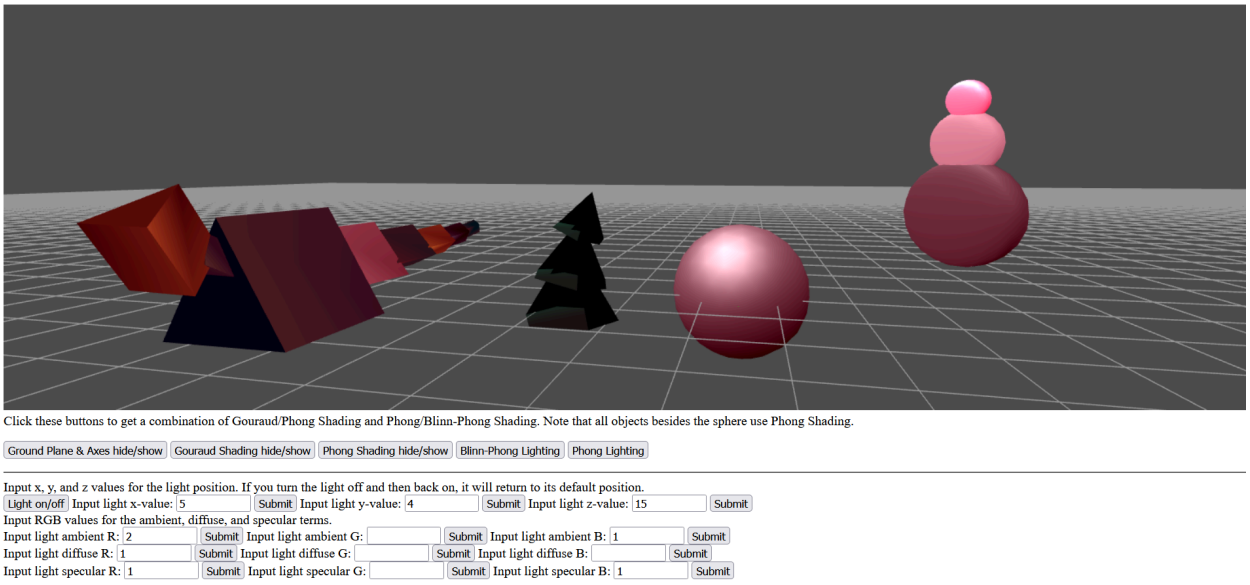


Figure 3: Gauraud Shading and Phong Lighting.

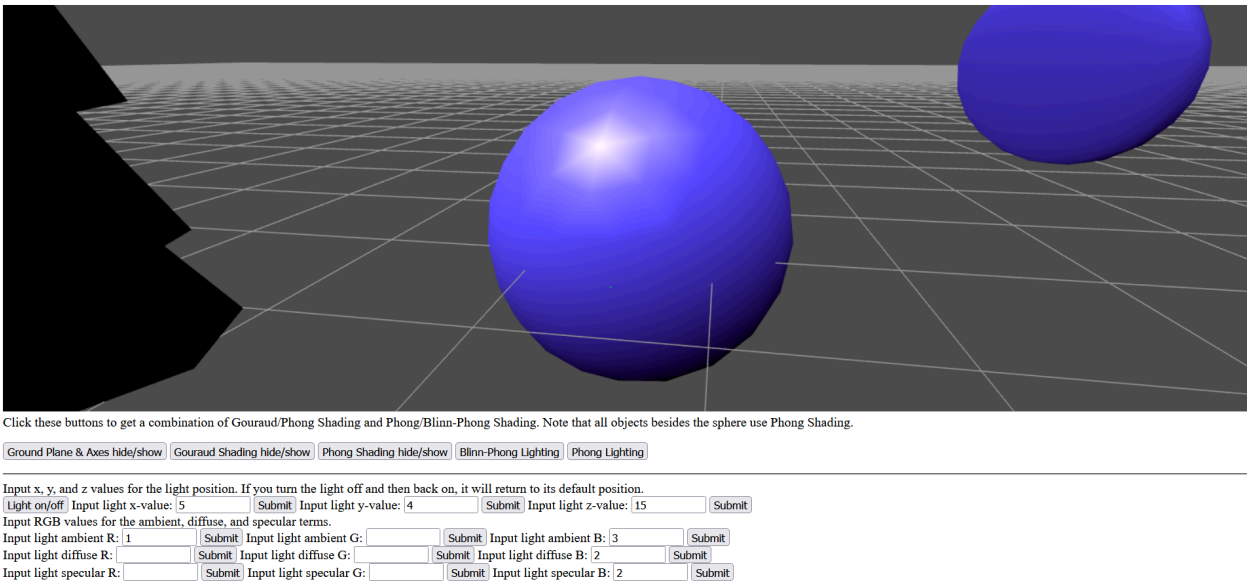
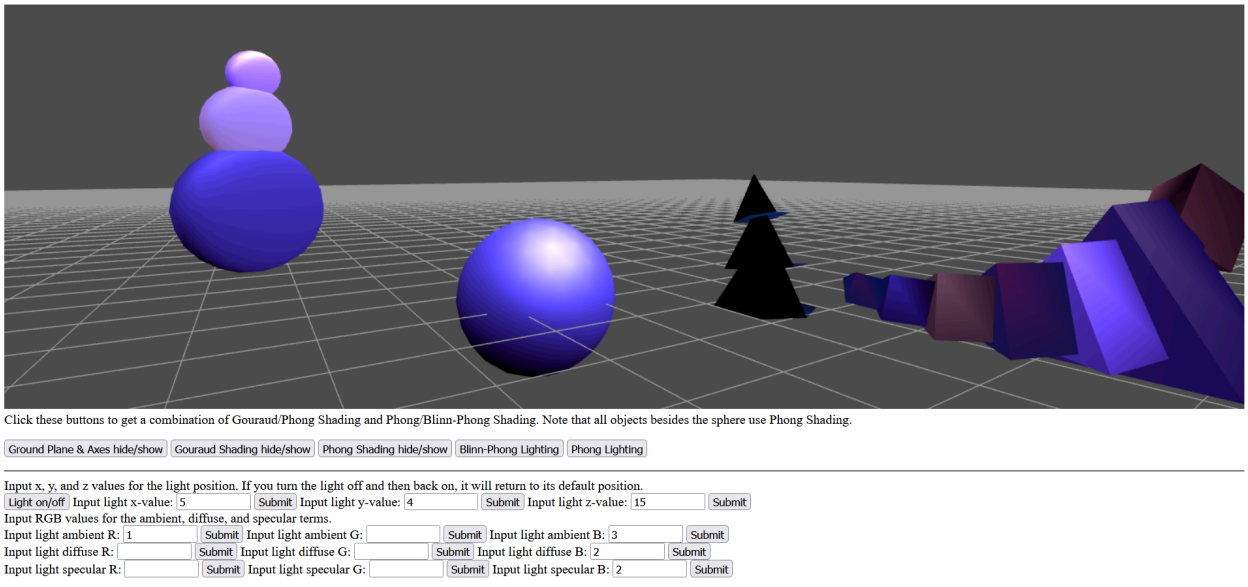
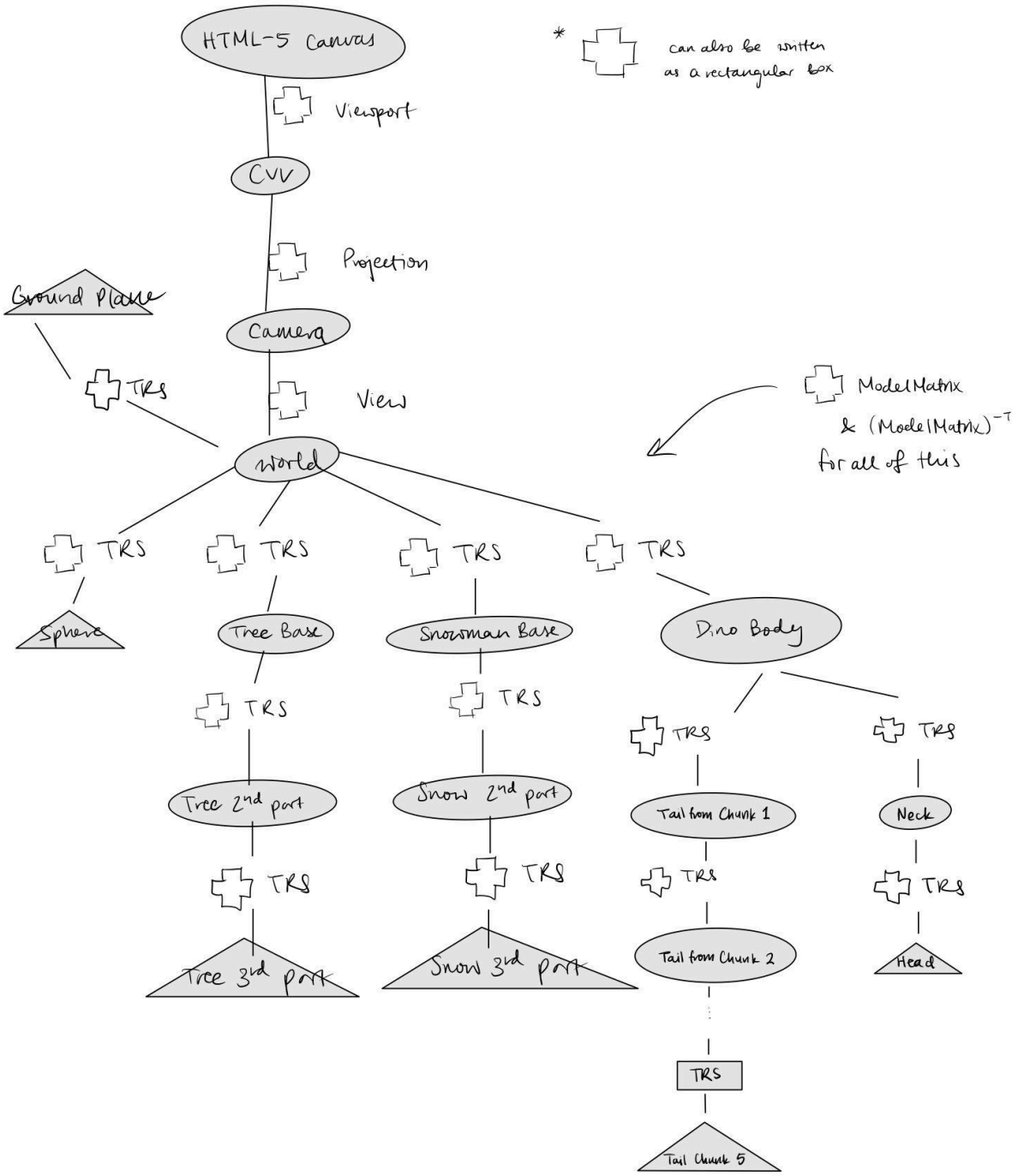


Figure 4: Differing materials. The center sphere is shiny, the dinosaur has a clay texture, and the snowman's head is shinier.



Scene Graph on next page.

Scene Graph:


HTML-5 Canvas
* can also be written as a rectangular box
Viewport
CVV
Projection
Ground Plane
Camera
TRS
View
ModelMatrix & (ModelMatrix)^-T for all of this
World
TRS
TRS
TRS
TRS
Sphere
Tree Base
Snowman Base
Dino Body
TRS
TRS
TRS
TRS
Tree 2nd part
Snow 2nd part
Tail from Chunk 1
Neck
TRS
TRS
TRS
TRS
Tree 3rd part
Snow 3rd part
Tail from Chunk 2
Head
TRS
Tail Chunk 5