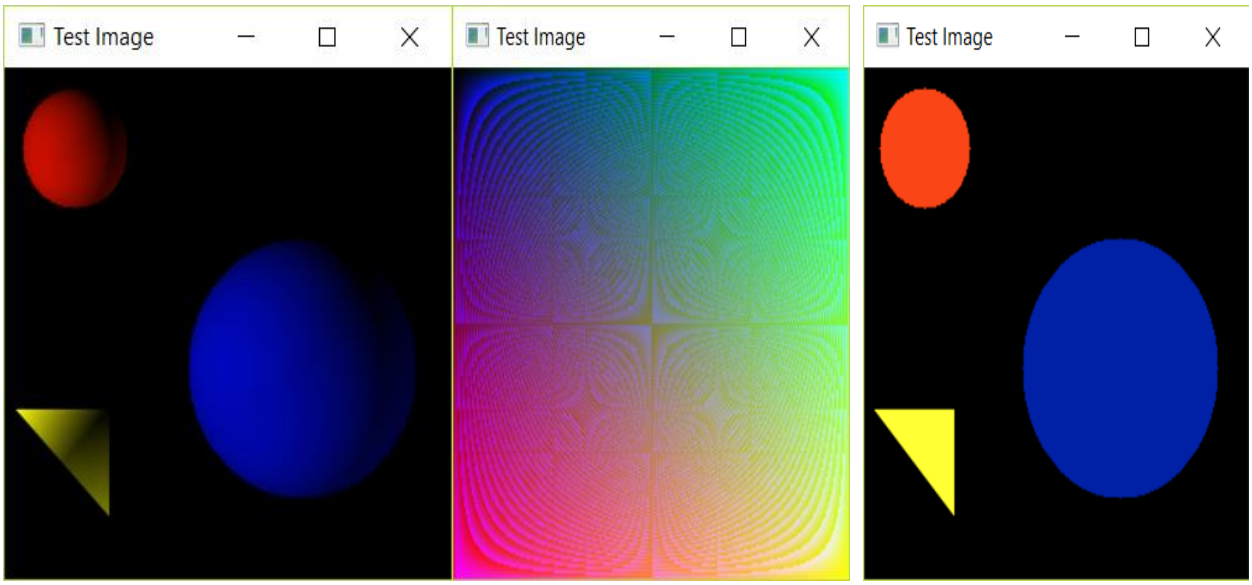
Kyler Ferrell-Clegg
CAP4730

Homework 1 Report

In this assignment we were tasked with creating two spheres in a rendered environment using a simple ray tracer and the Blinn-Phong shading technique (ambient, diffuse, specular). The results were very cool to look at as your initial 2D sphere is magically transformed into this 3D object.



(a): Two 3D Spheres + Tetrahedron (b): Test Image (c): Two 2D Spheres + Tetra

The overall experience was generally enjoyable. Before I could even really start the assignment I simply needed to get the program to be able to compile using CImg.h file. After much trial and error I finally solved the issue by having to use the following flags `-O2 -lgdi32`. I then started the assignment by figuring out what were the 5 different functions I needed that were essential to the task at hand. These were rayIntersection(), computeNormal(), diffuseShading(), ambientShading(), & specularShading(). I also started with the creation of all of the structures that I needed for the assignment (vector, rgb, sphere). The next real task was trying to get a simple test image to display. After playing with the CImg library commands I finally got a test image to display as indicated in Figure (b). I continued working and was then able to display my a image of the newly created spheres as shown in Figure (c). The biggest problem ahead was now applying all 3 of the shading effects to create my 3D spheres. It also required playing around with mostly my light vector to get the right angle that looked the best on the objects. The ray tracers effect on the tetrahedron is not like that of the two spheres. The tetrahedron has 4 faces and 4 vertices. From the perspective of my lighting and camera it would appear that there is a middle edge down the center (based on the darker area). I believe that the edges that

help define the geometry of the tetrahedron are partially lost on this object based on the use of parallel rays. All in all, I am very happy with the end result of my assignment.