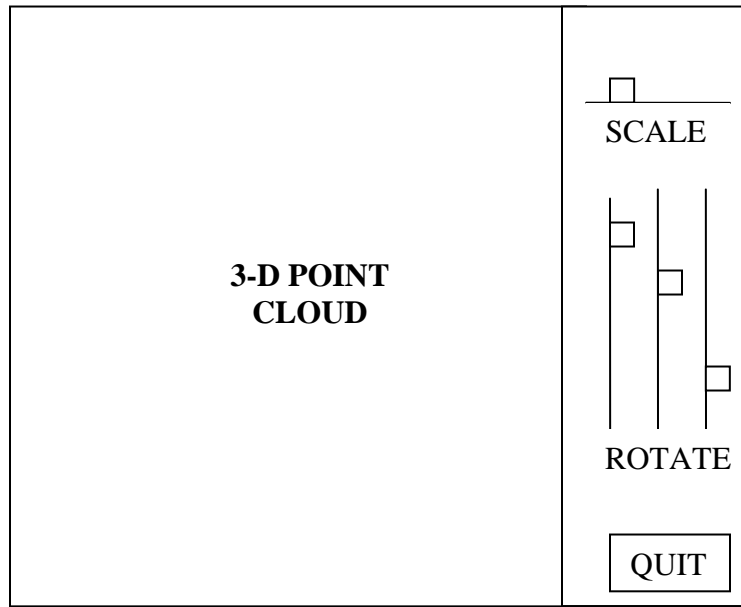


CEG-476/676

Final Project

Oct. 24, 2005



Design and implement a program to display a volumetric image by a cloud of points. The program to read in a volumetric image into a 3-D array is provided. Draw an image entry (x,y,z) that has a value larger than or equal to a provided threshold value by a 3-D point at (x,y,z) in the view volume. Let the RGB values of the point be the intensity at entry (x,y,z) . This will display the volumetric image in intensity form. Provide a means to rotate the volumetric object about x, y, and z axis by desired amounts using three sliders. Also, provide the means to scale up and down the object by another slider. (20 points)

Instead of displaying the points with values equal to the image intensities, display them with shading computed as follows: 1) Find normalized gradient at (x,y,z) , find the dot product of that vector and the direction of light $(0,0,1)$, and let the obtained value represent the RGB of the point. This will display the volumetric object in shaded form. Pressing the space bar while the mouse is within the image window should switch the display back and forth between the intensity and shaded forms. (10 points)

You may work alone or with a partner. Either way, turn in only one program and include your name(s) on top of the program. Your program should be tested to work on *gandalf* or PC running *MS Visual C/C++* or *.NET*. If your program works on *gandalf* submit it by entering:
~ceg476ta/turnin-final filename
where *filename* is the name of the file containing your program. If you tested your program using *MS Visual C/C++* or *.NET*, turn in your source and executable codes on a Windows PC disk.

Due: Nov. 10, 2005, 12:00 PM