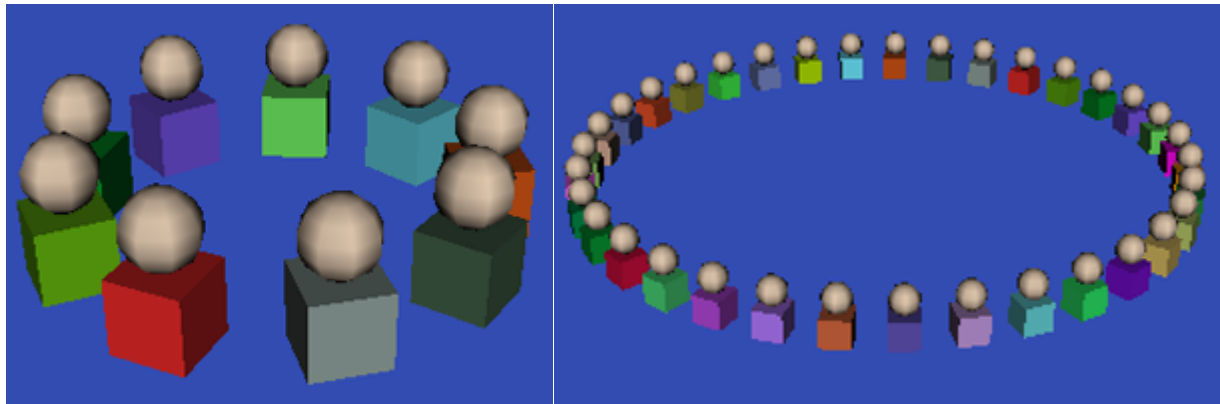


CSCI 4972 Introduction to Visualization
Assignment #1 3D Diagram of Environment or Object
Due: Tuesday September 7th, 5pm

For this assignment you will use VTK to build a simple 3D scene that visually explains or describes how to assemble or navigate or operate something. For example, the images below visualize an arrangement of students in classroom that is amenable to group discussions. The program takes in a single integer argument that indicates the number of students in the class. The students are spaced evenly on a circle whose radius increases as the number of students increases. Each student is also randomly assigned a color for their shirt.



To complete this assignment you will need to learn how to build and run VTK programs, how to insert simple geometric objects into a scene, how to arrange those objects using transformations (translation, rotation, and scaling), and how to specify the color of objects and the background. The goal for the first week's "lab" (the second half of the Wednesday morning class time) is get familiar with VTK. To get started, choose an example page, e.g., <http://www.vtk.org/Wiki/VTK/Examples/Cxx/GeometricObjects/Cube> and follow the instructions here: http://www.vtk.org/Wiki/VTK/Examples/Instructions/ForUsers#Build_an_example

You should practice with CMake a little bit by changing the name of the example file (e.g., from Cube.cxx to hw1.cxx) and changing the appropriate parts of the CMakeLists.txt file to match (see <http://www.vtk.org/Wiki/VTK/Tutorials/CMakeListsFile> for a complete explanation).

As you work, you'll want to browse the general VTK documentation:

<http://www.vtk.org/doc/nightly/html/classes.html>

And also search through the VTK Examples library:

<http://www.vtk.org/Wiki/VTK/Examples/Cxx>

Once you have mastered the basics, it's time to brainstorm a visualization challenge. Be creative (points are awarded for creativity) yet simple (this is a 1 week assignment after all). As in the example above, the "people" are built from the simplest components, yet the end result is quite expressive. Your visualization should be parameterized or controlled by passing in different arguments on the command line. Put some thought into aspects of the design as well,

e.g., using color effectively.

Assignment Requirements

- Create a simple VTK program
- Visualization parameterized by one or more command line arguments
- Place multiple objects into a 3D scene (e.g., cube, sphere, cone, etc.)
- Use transformations to manipulate and arrange the objects
- Use color to enhance your visualization
- Write a couple paragraphs describing the purpose, design, and implementation of your visualization (use the README.txt template)

Grading Criteria

(5 pts) Creativity of visualization design

(5 pts) Effectiveness of visualization & writeup

(10 pts) Technical content (e.g., VTK transformations & geometric objects & coloring)

How to Submit:

- Post at least two different screenshots of your visualization (showing different parameter settings) and a short paragraph describing the purpose and design of your visualization on LMS.
- Submit the source code (and any necessary data files) for your program to the CS homework server.