

## Lab 8 – csc 471: Playing with 3D viewing

This lab we will work on playing with 3D viewing and moving the camera around in our scene. We will start by using `gluLookAt`, in order to move the camera around in our scene (i.e. to simulate scaling and translating). This lab will help you prepare for program 3 and 4. We will continue to augment the `MeshParser_release3.cpp` file from the last lab:

First:

- 1) Allow the user to toggle between orthographic and perspective projection by enabling the “v” key to toggle between these two projection modes. Please use `glOrtho` and `gluPerspective`. Make sure that your scene does not change drastically (i.e. both the mesh and the sphere should remain in view, but in perspective the sphere should appear further away than the mesh).

Next, you will notice that there is already a `gluLookAt` call in `display`. Alter this code so that the `gluLookAt` call can take in variables such that:

- 2) The user can choose to translate the camera (only in the x-y plane) using the mouse. Limit the translation to something reasonable (so that the mesh does not completely leave the window). You may switch into camera translation mode with a keyboard or menu event. Make sure your translation looks like translation not rotation.
- 3) The user can scale the entire scene (i.e. move the camera closer to the object or further away from the object) again using the mouse. Mouse movement to the right and upward should bring the object closer, while mouse movement to the left or down should move the object further away. You may switch into scene scaling mode with a keyboard or menu event. (Scaling will only be evident in perspective – why?). Make sure you write your scaling routine such that you can scale along other vectors than just the z-axis (hint: use the camera parameters to achieve this).