Manual

The locations of the near and far planes are indicated in the Gtk::Label at the bottom of the screen. The current application mode is also indicated in this label.

All of my clipping is done within the <void Viewer::draw\_line2D( Point3D left, Point3D right)> function. I implemented clipping using the algorithm outlined in the course notes. I first clip to the near plane, then to the far plane, and finally (after projecting and normalizing) clip to the viewport.

Clipping to the near and far planes is nearly identical. If the line is outside the clipping area, it is not drawn. If the line is inside the clipping area, it is drawn. If the line intersects the clipping area, it is clipped to the correct length and then drawn.

Clipping to the viewport works essentially the same as clipping to the near and far planes. The only difference is that the points have already been projected and normalized, and thus are now 2D points. As there are not really any 2D point functions defined, I manually do the calculations.

I store four matrices in viewer:

* m\_projection: This matrix maintains and applies the projection transform.
* m\_modelling: This matrix maintains and applies the modelling transform to the unit cube (and gnomon). However, only rotation and scaling are kept here.
* m\_viewing: This matrix maintains and applies the viewing transform to the entire scene. It keeps track of rotation and translation.
* m\_scaling: As we must apply scaling to only the unit cube (not the gnomon), scaling is kept in this separate matrix. This gets applied to the unit cube as a part of the modelling transform.

There is an issue with the reset menu selection. It does reset everything, but it requires some interaction for the screen to get redrawn. I couldn’t quite figure out how to get this issue fixed.

There is also an issue with updating the FOV. The FOV update works fine, except when it gets applied after a near/far plane update. In this case, it goes all glitchy, lines wrap around, and the geometry gets messed up. I couldn’t figure out how to resolve this issue.