ICS 280 F02: Computer Graphics
Programming Assignment 4
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Assigned: Nov 8, 2002
Due Date: Nov 14, 2002 11:59pm.

1. Implement the algorithm to visualize 2D Voronoi Diagram using right circular cones and orthographic projection. Assume you have, say, 20 points at random locations on the plane to be considered as apex. Move these points slowly in random directions and see how the diagram changes.
2. Implement Silhoutte visualization algorithm. Choose models from ~graphics/data/*.ply. Note that there is a slight difference in the ply format from what you used in your first assignment. If required you can change the input file format the way you want. But include the changed model files with your submission. Use lighting in appropriate position such that you are able to see the lighting effect on the silhouettes.
3. Follow question 4 of the mid-term exam. Take snap shots of the rendered image for the three cases mentioned in the question paper. Try a few other cases like (x'/w, y'/w, z'/-z, 1) etc. Document your results with the cases and its corresponding snapshots.
4. Draw a cube with one pair of opposite faces (out of three pairs) transparent. These two faces are of different colors and different alpha values. Rotate the cube around its center such that any transparent face can be at the front, and the other at the back. To order the faces back to front, you can use a simple measure of finding the distance of the centers of these two faces from the view point and ordering them. You don't need to adopt any complicated algorithm to do this. Now implement the rendering in two ways.
    a. Rotate the cube with no ordering of faces and document the results under two important positions (each face is at the front).
    b. Do (a) with face ordering.
5. Render a sphere with bump mapping and lighting. Use any bump function you like to generate interesting results. Note that you *need* to have lighting to do bump mapping.