CS 425 Lab Exercise – Creating and transforming cones

Follow instructions below and in "TODO" comments in the code provided. Submit your final files to Blackboard.

1. Three files are provided for use with this exercise:
    a. coneExercise.html – A web page in which to view the results

    b. coneExercise.js – A JavaScript file to run the "main" application. It creates and displays a set of axes, and instantiates and renders several cone objects.

    c. cone.js – The Cone class. The constructor calculates vertex locations and pushes them to the GPU, and a render( ) method draws the cone using uniform variables in place at the time.

2. On a piece of paper or the equivalent, draw a sketch of a cone, with the base centered at the origin and the point pointing upwards along the Y axis. The height and diameter of the cone should both be 1.0. Label the point of the cone as vertex 0. Then vertex 1 lies along the X axis at X = 0.5. Vertices continue in a counterclockwise direction until they get back to the beginning. Vertex 1 has to be duplicated at the end, making it vertex nSectors + 1.

3. Run the program as is to see what you are starting with. Then perform the following changes, rerunning the program after each change to see the effects one by one.

    a. TODO 1 – Adjust uViewXform to give a "nicer" view of the axes. Why couldn't you see all three axes originally.

    b. TODO 2 – Adjust uProjection to use a perspective projection instead of an orthographic one. (You might see more effect of this if you change it after there are cones to see.)

    c. TODO 3 – Make changes in coneExercise.js and cone.js to render a unit cone at the origin.

    d. TODO 4 – Adjust uModelXform to scale down the unit cone, so the unit axes are visible.

    e. TODO 5 – Create and place one or more solid color cones in different places.

    f. Play around with different parameters to see the effect. What do you get if you make a cone with 4 sides? Is there a bottom? Can you add one? How can you tell?