CS380 Computer Graphics

Assignment #2

20160826 윤건희

1. **3D Geometric Objects**
    a. **generateCone**
    A cone consists of two parts: the circular bottom face, and the side face. The bottom face is basically a circle of which its center is located at the origin. Using trigonometric functions, the vertices of triangles that form a circle were obtained. The side face of the cone consists of multiple triangles with their base vertices at the bottom face and the other vertex at the top vertex of the cone which is [0, h, 0], where h is the height.
    b. **generateCylinder**
    A cylinder consists of two circular top and bottom faces, and side faces. The side face consists of multiple rectangles with their vertices located at the top and bottom faces. The top and bottom faces consist of triangles that form circles of which their center is located at [0, 0, 0] and [0, h, 0] where h is the height of the cylinder. Vertices were obtained using trigonometric functions.

2. **Hierarchical Modeling of Avatar**
    The model is comprised of 22 parts.
    1 torso, 1 head, 4 arm parts, 4 arm joints, 4 leg parts, 4 leg joints, 2 hands, and 2 feet. The torso is parent to the head, 2 arm joints (left and right shoulder), 2 leg joints (left and right hip). The shoulders are parent to the upper arms, and the other arm joints connect the upper arm and the lower arm. The lower arms are parent to the hands. Similarly, the hips are parent to the upper legs, and the other leg joints connect the upper legs and the lower legs. The lower legs are parent to the feet.

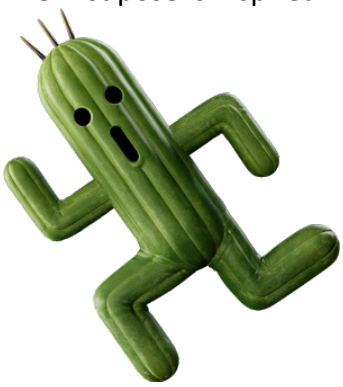
    The other parts include eyes and a mouth, which are purely aesthetic. However, these parts are children of the head part, so that the eyes and the mouth move along with the head in the animation.

    The torse is a cone. The head, the joints, the hands, and the feet are spheres. The arms and legs are cylinders.

3. Interactive Avatar Pose
    There are three poses.
    The first pose can be played by pressing “w” on keyboard (make sure caps lock is not enabled!). The second pose can be played by pressing “s” on keyboard. The avatar resets to original position before playing each pose, so that arms and leg movements do not get mixed up.

The camera can be rotated using “a” and “d” on keyboard. The camera will stop when “f” is pressed. When the head is clicked with mouse, the avatar gets into the first pose then rotates.

4. Creativity
   The first pose is inspired from a monster called “Cactuar” from Final Fantasy Series.



   The second pose is inspired from power rangers. But I cannot find that specific pose for some reason.