CS 174A — Introduction to Computer Graphics: Assignment 2

Weight: 15 %
Maximum points: 37

> Note: You can receive **extra credit** on this assignment. We will select the best animations, screen them in class, and you will vote for your favorites. The top 3 animations will be awarded *extra points on this assignment*, as follows: 1st place: 10 points; 2nd place: 5 points; 3rd place: 3 points.

Collaboration: **None**. If you discuss this assignment with others you should submit their names along with the assignment material.

Let your imagination and creativity fly!
Start working on this assignment early. You will not have time to do a satisfactory job at the last minute.

Write a program that displays an animated scene. Your scene should include a combination of hierarchical objects that move around. Required elements:

- [4 points] Show at least one two-level hierarchical object (e.g., a human arm).
- [4 points] Demonstrate the camera tracking a moving object using *LookAt*.
- [6 points] Design polygonal objects of your own. You must provide positions, normals, and texture coordinates directly, by extending the Shape class.
- [2 points] For one of your custom polygonal objects, show at least one flat-shaded seam (or discontinuous edge) and light it with the Phong reflection model.
- [2 points] Texture one of your custom polygonal objects procedurally or by mapping an image.
- [2 points] Real-time speed. Make sure that your animation runs at the same speed regardless of the machine your program runs on; i.e., one simulated second corresponds roughly to one real second.
- [2 points] Display the frame rate of your program on the graphics window.
- [2 points] Make and submit a movie of your animation (length 90 sec or less) using your favorite screen recording application (e.g., camstudio/quicktime). If your program is interactive, submit a video of it being used. You can add subtitles. Make sure you encode your movie to within 100MB and observe the 90s limit.
- [4 points] Creativity (story, aesthetic style, etc).
- [4 points] Complexity. Are the underlying mechanics that make it work impressive?
- [5 points] Overall quality: Fluidity of object and camera motion, attention to detail in scene construction and texturing, etc.

Special instructions:

- Your video must be only of what your program executable can output given certain user inputs. The video should not be edited.
- Note that creativity and quality amount to 9 points. You will not get a perfect score if your scene is complex, but not creative.
- You must use the provided template code; however, you can modify it as you see fit.
- You must do the assignment from scratch. Using any piece of code from any source (e.g., previous offerings of the course, the web, etc.) will be considered plagiarism.
- You can see examples of animations made for previous offerings of this course at:
  http://www.cs.ucla.edu/~dt/courses/CS174A/animations/ and http://web.cs.ucla.edu/~garett/cs174a_projects2/

Submission guidelines:

- Submit your movie with the name *<uid>.ext*, where *<uid>* denotes your 9 digit bruin ID, *ext* can be any common video format such as *mp4* and *mpg*.
- Submit all the files required to build and run your project in a single archive named *<uid_language>.zip* (e.g., *123456789_cplusplus.zip* or *123456789_javascript.zip*). Include the project files, but do not submit any large intermediate files (extensions like *.pdb* and *.sdf*)
- If you use texture mapping in your project, submit all the images within *<uid_language>.zip* in the location required by your program. They should not have to be moved in order for your program to run correctly.
- Include in the top level of your *<uid_language>.zip* archive a *README.txt* file that summarizes your animation (which we may need to display before screening your video), identifies the hierarchical, polygonal, and texture mapped objects, and explains anything else that might be helpful to know in grading your project.