Computer Graphics, Computer Project 3: Viewing and Projection.

2 weeks to go

1. Based on the sample programs presented in the classes, design and implement a program to demonstrate the effects of changing view and using different projection methods.
2. Use the robot of project #2 as the main character. However, you can add more objects though.（不可以用範例程式場景，要用第 2 次作業的機器人當主角）
3. To achieve better viewing effects, you must allow users to translate and rotate the camera position, focus, and view up vector (surge, heave, sway, roll, yaw, and pitch motions.)
4. To demonstrate the effects of projection, please implement the following 5 projection methods: (65%)
   a). Method 1: Orthographical projection along x-axis. (10%)
   b). Method 2: Orthographical projection along y-axis. (10%)
   c). Method 3: Orthographical projection along z-axis. (10%)
   d). Method 4: Perspective projection. (10%)
   e). Method 5: Divide the window into 4 view-ports, 3 view-ports for displaying the orthographical projection images and 1 for viewing the perspective projection image. (25%)
5. Allow users to switch among these 5 projection methods. (10%)
6. Please display the world coordinate system in the images of all projection methods. You must draw the origin and the 3 axes. (利用 RGB 代表 XYZ 軸 10%)
7. Show the view volume of the perspective projection method in the orthographical projection images. Represent the view volume as a transparent pyramid or just display the edges of the view volume. (10%)
8. Try to implement the zoom-in and zoom-out method for the perspective and parallel projections. (10%)
9. Any other fancy ideas are welcome. (5%)

[Note]. You have 2 weeks to complete this project. However, if you need extra time, you can demo your program within 3 weeks.

If your scene is not based on those of the 2nd project, you will receive no credit.