

Interactive Graphics

Lab Session of March 21st 2017

Objective: Understand and Experiment with transformations specifications in WebGL, use of buttons, menus and sliders

Background: knowledge of the theory behind the above topics, basic knowledge of HTML, Javascript and WebGL.

Tasks:

1. Download from the Course Web Site the necessary files in the Resources/Resources/Lab Sessions section: IG20170321.zip
2. Unzip on the Desktop
3. Open the file Lab20170321.html in a browser
4. Open the files Lab20170321.html and Lab20170321.js in a text editor (Notepad++ or similar)
5. Add a button that switches from perspective to parallel projection. Use the **ortho(left,right,bottom,top,near,far)** function. Choose appropriate values for the parameters
6. Add a slider that controls the z component of **eye** from 1 to 10 with step 1 (initial value = 3)
7. Add a slider that controls the y component of **at** from -2 to +2 with step 0.2 (initial value = 0)
8. Add buttons to change the **up vector** from the y-axis (default) to x-axis and viceversa
9. Create a new scene with two smaller cubes, one positioned on the positive y and one in the negative y. The size of the cubes should be half of the original for the top cube and one third for the bottom one.
10. Animate the two cubes with two distinct buttons that start and stop the animations. Default speed is 2 degrees per frame
11. Add two sliders to control the rotating speeds of the two cubes. Sliders can have positive and negative values, to change direction.
12. Using the gl.viewport command, split the window in two parts, one will show only the top cube and the other the bottom one

References:

Course Web page	https://piazza.com/uniroma1.it/spring2017/1044398/home
JavaScript Tutorial	https://www.w3schools.com/js/default.asp
HTML5 Tutorial	https://www.w3schools.com/html/default.asp
WebGL Book Material	http://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SEVENTH_EDITION/
WebGL Programming Guide	https://sites.google.com/site/webglbook/
WebGL official site	https://www.khronos.org/webgl/
WebGL 1.0 specifications	https://www.khronos.org/registry/webgl/specs/1.0/
GLSL specifications	https://khronos.org/registry/OpenGL/specs/gl/GLSLangSpec.4.50.pdf