

Lab 1.2 Assignment

1. Keyboard Control:

Done with `GLFW_PRESS == glfwGetKey(window, GLFW_KEY_RIGHT)`. The key enum is passed through the function to find out which key is pressed followed by required actions.

2. Keypress to show rotation around x-, y- and z-axis:

Created an identity matrix for rotation and changed the value of 5th, 7th, 9th and 10th element for x-axis rotation. 0th, 3rd, 8th and 10th element for y-axis rotation and 0th, 1st, 4th and 5th element for z-axis rotation.

3. Keypress to show x-, y- and z- axis translation:

Declared an identity matrix for translation and on every keypress changed the value of 12th element for x-axis, 13th element for y-axis and 14th element for z-axis translation.

4. Keypress to show uniform and non-uniform scaling:

For uniform scaling, we can change the value of 0th, 5th and 10th element of scaling matrix in a single go, which will change the dimensions of triangle in all axes.

Whereas, for non-uniform scaling, 0th element can be changed for x-axis, 5th for y-axis and 10th for z-axis respectively.

5. Keypress to show combined transformations:

If we changed all three matrices simultaneously or pair of two, we can achieve combined transformations.

6. Multiple triangles using the same buffer but different transformation matrices:

We can create multiple triangles using a single vertex buffer by creating an index buffer which keeps count of the indices of all the triangles we need to render.

To create different transformation matrices, we can declare new matrix for every triangle and make required changes in them as per the key press events. We can then call `glDrawArrays(GL_TRIANGLES, 0, 3)` for all the triangles we need to draw preceded by `glUniformMatrix4fv()`.

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