INB381 – Transformation

Download Workshop6Code.zip

Extract the files and folders, as you will modify them to complete this week's workshop.

Introduction

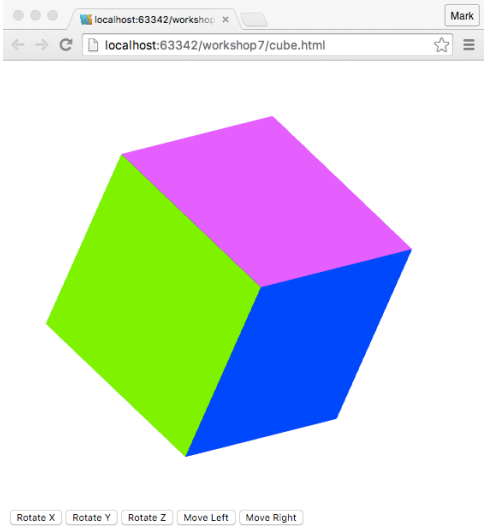
This week's workshop is focused on transformation. Transformation can be performed within the application or on the GPU, as described in your lecture notes. What is the difference?

- By performing the translation within a shader the GPU is responsible for the computation and improves performance.
- By performing the translation within the application the computation is performed by the client's CPU this is slower. We are using WebGL therefore code for the translation will be in a Java Script file.

Exercise 1 – Shader Translation Exercise

This demonstrates a few different things. Callbacks for mouse events, updating vertex data on the video card and using a matrix stack for vertex transformations.

1. Task 1 – Moving the cube horizontally left and right.
    a. Note the translation must be performed within the shader.
    b. Add a left and right control.
    c. Pass the offset values to your shader only.
    d. Examine the code that performs the cubes existing rotation for x, y and z axis.
    e. Add the necessary code to move the rotating cube left or right.
2. Task 2 – Change the cube to display solid colours on each face.
    a. Modify the code to change the colour of the faces.



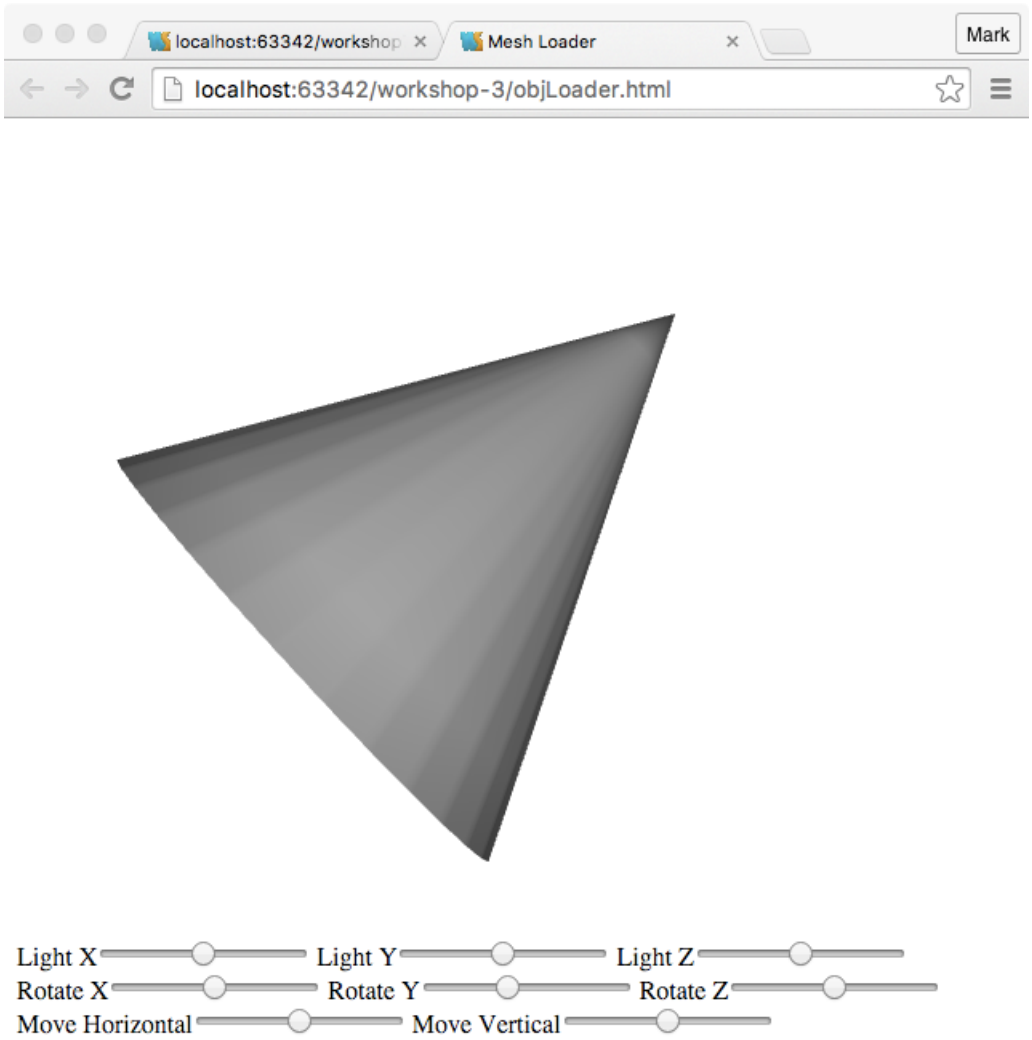
Example output

Exercise 2 Optional – Application Translation Exercise

Download the Workshop 3 Solution uploaded to Blackboard

This time the transformation matrix is calculated client-side and is represented in the vertex shader as a uniform variable. This allows us to separate the functionality of deciding where to draw something from the function of actually drawing it.

1. Task 1 – Move the object loaded both horizontally and vertically.
    a. Note the translation must be performed within the application.
    b. Add a horizontal and vertical control.
    c. Examine the code that performs the cubes existing rotation for x, y and z axis.
    d. Add the necessary code to move the object horizontally and vertically.



Example Output