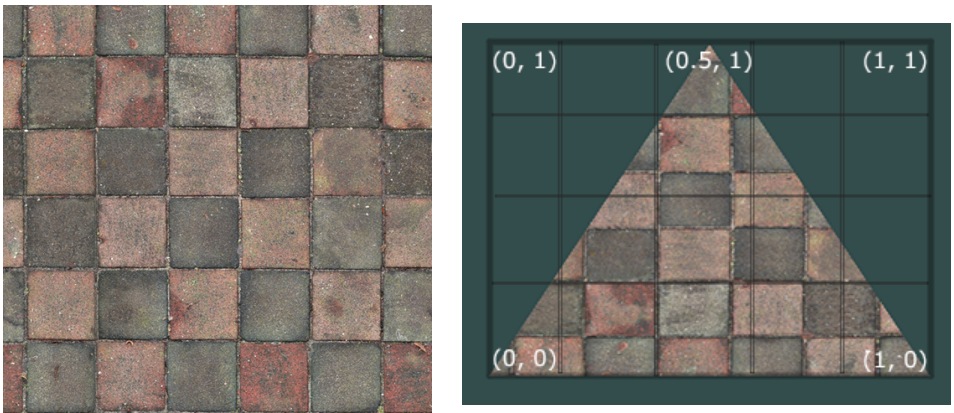
CSE 333/533: Computer Graphics

Lab 06: Texturing

November 16, 2022

1 Introduction

In this lab we will look at how to apply texture from an image onto an object. In order to map a texture to a triangle we need to tell each vertex of the triangle which part of the texture it corresponds to. Each vertex should have a texture coordinate associated with it that specifies which part of the texture image to sample from.



(a) Texture Image

(b) Texture mapped triangle marked with texture coordinates

Figure 1: Texture mapping. [1].

Texture coordinates range from 0 to 1 in the x and y axis. OpenGL texture mapping process is as follows:

- Firstly we create a texture name using `glGenTextures` which takes in 2 parameter - the number of textures to be generated and array where generated texture names will be stored.
- Post the binding you specify the two dimensional texture image using `glTexImage2D` which takes in different parameters for the target, level, width , height etc. Most importantly it takes in the pointer from where the texture data will be read (image).
- Then you generate the mipmaps for the texture object and set various texture parameters.

Run the given code (download from Classroom) to see how to setup texture mapping on a triangle.

1.1 Lab Code instructions

1.1.1 Changes in Shaders

- Uncomment line no. 88, 89 and line no. 98 in vshader (main.cpp).
- Uncomment lines 104, 105, 109 in fshader (main.cpp) and comment line 83 to disbable the default color.

1.1.2 Changes in main

- Uncomment line no. 183, 184 for texture-coordinate attribute to bind at a location.
- Uncomment 190-211 for texture gen and texture map.
- Uncomment 235 for bind texture.

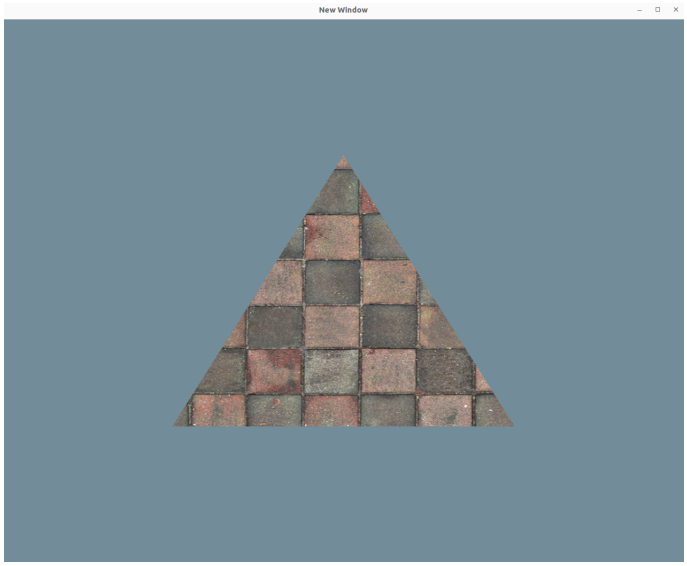


Figure 2: Texture mapping on a triangle.

2 Deliverables

The task for the lab is to generate a textured cube. Submit the output along with code for evaluation. Further record screen and upload a gif/video demonstrating the widgets. You can use Kazam to record. Upload the zip file of code and output. Name the zip file as Lab06_<name_ roll no>.zip

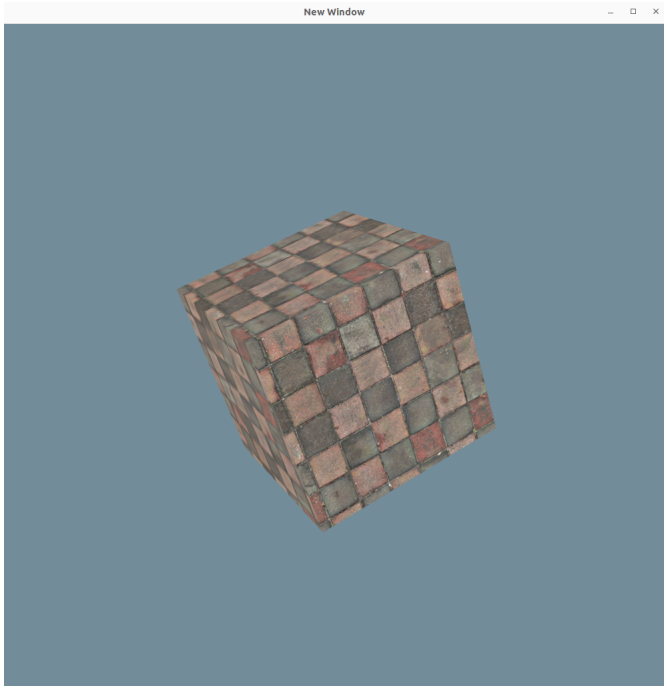


Figure 3: Textured cube.

References

[1] LearnOpenGL - Textures. site: https://learnopengl.com/Getting-started/Textures

[2] Some examples :https://github.com/fpaut/my_antons_opengl_tutorials_book