11494 Interactive and GPU Computing	Lab. 7 - 20/05/2015

GLSL Textures

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The goal of this assignment is to understand how to use textures inside the OpenGL environment using the GLSL language.

1 Exercises: CPU Textures

1. Download the source code for this class, and analyze it carefully. Build and run it. You should have an interface with a black background and a white quad.
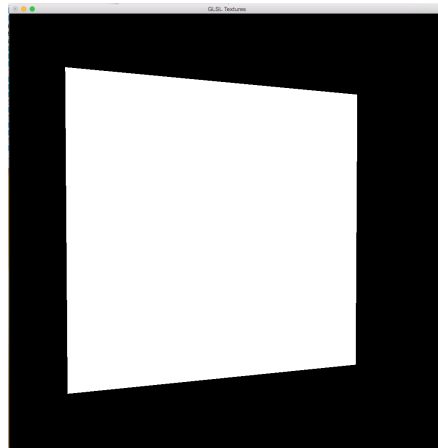

Figure 1: Initial interface.

2. Use the img_cheryl.jpg image to texture the quad defined inside your render() method.
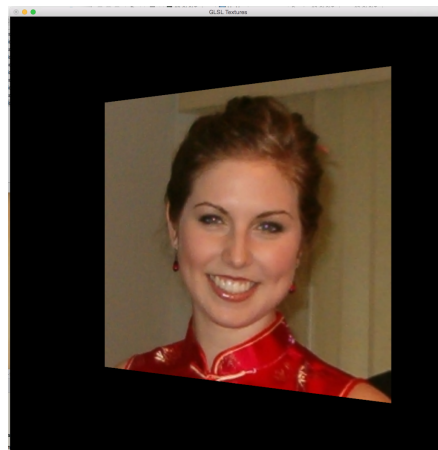

Figure 2: Textured quad.

3. Use all other images to texture the quad defined inside your render() method. Is there any diference?
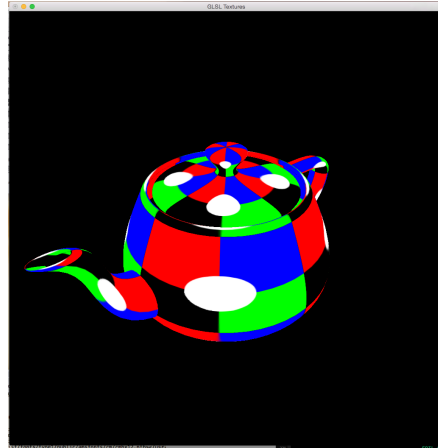
4. Render and texture a glutSolidTeapot.

Figure 3: Textured solid teapot.

5. Render and texture a glutSolidDodecahedron.
   Why does the glutSolidTeapot is rendered with textures and glutSolidDodecahedron is not?

2 Exercises: GPU Textures

Now, and only using the GLSL language perform the following steps.

1. Use the img_cheryl.jpg image to texture the quad defined inside your render() method.

2. Render and texture a glutSolidTeapot.

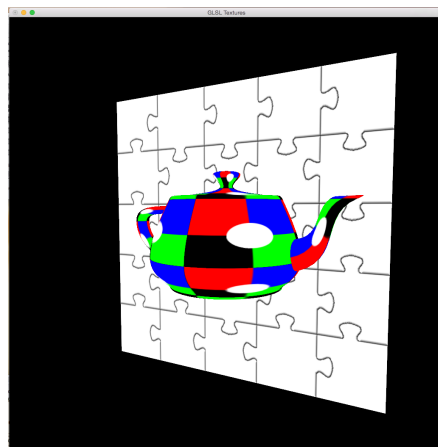3. Use two different textures one for the quad and other for the solid teapot.

Figure 4: Two objects with two different textures.

3 Exercises: GPU Textures, VBO, Illuminaiton

Now, and only using the GLSL language perform the following steps.

1. Modify your program to use VBOs to communicate with the GLSL shader.

2. Add illumination properties to your 3D scene using the Phong illumination model.

References

[1] Simple OpenGL Image Library `http://www.lonesock.net/soil.html`, last access on 20/05/2015

[2] GL_EXT_abgr `https://www.opengl.org/registry/specs/EXT/abgr.txt`, last access on 06/05/2015.

[3] glTexParameterf `https://www.khronos.org/opengles/sdk/docs/man/xhtml/glTexParameter.xml`, last access on 06/05/2015.

[4] glTexEnv `https://www.opengl.org/sdk/docs/man2/xhtml/glTexEnv.xml`, last access on 06/05/2015.

[5] glTexImage2D `https://www.khronos.org/opengles/sdk/docs/man/xhtml/glTexImage2D.xml`, last access on 06/05/2015.

[6] glTexCoord `https://www.opengl.org/sdk/docs/man2/xhtml/glTexCoord.xml`, last access on 06/05/2015.

[7] gluBuild2DMipmaps `https://www.opengl.org/sdk/docs/man2/xhtml/gluBuild2DMipmaps.xml`, last access on 06/05/2015.