CMT107 : Visual Computing - Lab Sheet 5

Texture Mapping

Download the file Lab5.7z from the Learning Central and extract it. Create a new project on the Intellij IDEA and copy the extracted files to the proper folders in the project. You may also need the Basic package used in Lab 3. To read in the texture file WelshDragon.jpg correctly, you should put it in the project root directory. Both VC05.java and VC05M.java do the same work. They implemented a simple texture mapping. The only difference between these two programs is that the former uses OpenGL core functions to manipulate textures, while the latter uses jogl classes Texture and TextureIO for texture operations.

Run both programs to check that they work, and then do the following:

- Examine VC05.java and VC05M.java; identify the lines for texture mapping. Check also those commented lines. They may contain some useful information.
- Both programs have the same texture coordinates, but the results are different. Can you explain why?
- Change the texture coordinates to the range of [-2, 2] (Comment out those lines in the range[0,1], and uncomment those lines in the range [-2,2]). Run both programs again to compare their differences. You will see that the default wrapping mode for OpenGL core functions (in VC05.java) is GL_REPEART, while for Class Texture ((in VC05M.java)) it is GL_CLAMP_TO_EDGE.
- Change the vertex colours and run the program; and you will see the effects of the changes with vertex colours.
- Comment out gl.glTexParameteri(GL_TEXTURE_2D, GL_TEXTURE_MIN_FILTER, GL_LINEAR); in VC05, you will find that the texture mapping does not work, which means that this line is necessary when using OpenGL core functions for texture mapping.
- Now, examine the shaders ColourTex.vert and ColourTex.frag. Try to understand every lines of both shaders. They are short anyway☺
- In the fragment shader, the original fragment colour is modulated with the texture colour. On the commented lines of ColourTex.frag, you can see the linear combination of both colours, or blending both colours with a constant colour (vec4(0.8,0.5,0.3,1)). Try the other combinations of both colours to see the effects.