

COMP3811: Computer Graphics

Coursework 2

Interactive Animated Scenes with OpenGL

Due Date: 5 December 2015, 5 pm

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Marking

This coursework is summative and counts towards your final mark for 35 % (total coursework counts for 50 %)).

Submission Instruction and Note on Plagiarism

Submission should be done through the VLE by the due date. Submissions through the SSO will be ignored and result in 0 marks. Your submission should be in a single tar file that contains a report and source code. Source code must be provided with a Makefile and must compile and run on DEC10. Source code that does not compile and run will not be looked at and no marks will be awarded to any programming exercise that it relates to. The report is basis for assessment, with the source code as supporting evidence for assertions made in the report. Answer all the questions and provide the explanations that are asked for. Refer to your code in explanations, but do not provide answers like: 'see source code'.

You are allowed to discuss ideas with colleagues. You must program independently and not base your submission on any other code than was provided during the tutorials, and textures which are in a tar file called `textures.tar`, which is located in the `coursework 2` folder on the VLE, the same folder which contains this specification. Changing variable names in someone else's code is not a good idea.

Creation of an Interactive Animated Scene using OpenGL

Using Qt's `QGLWidget` you will create an application that demonstrates the ability to render visual scenes using *OpenGL*. You are free, within some limits, to create a scene of your choice. Assessment will be based on the sophistication of the scene and scene elements as well as possibilities for user interaction. The scheme below sets out minimum requirements that must be met for grading in certain bands. Grading within a band is assessed on: coding style and commenting, explanation of the design choices and implementation in the report, and visual impact.

- **40%-50%:** You must create a visual scene that demonstrates a reasonable complexity through instancing. Examples could be a group of buildings, constructed from cubes, body shapes constructed from cylinders and spheres and a combination thereof. Light and material properties

must be chosen that allow specular and diffusive light contributions to be recognised. You are allowed to use glut objects. The report must explain your design. Your scene must deviate substantially from the simple scenes that were provided during the tutorials.

- **50%-60%:** Your scene must fulfil all requirements for the **40 %-50 %** band. Your scene must contain at least one element of user interaction, for example, a slider to manipulate viewing angles or a dialog box to set material or light properties. The scene must contain texture mapping. Some texture images will be provided in the tar file. They all *must* be used, but you are free to add your own.
- **60%-70%:** Your scene must fulfil all requirements for the lower bands, as well as contain an element of animation, for example rotating or spinning objects. The scene must contain at least one convex object that you have constructed from polygons.
- **70%-100%:** Your scene must fulfil all requirements for the lower bands and contain an object that requires hierarchical modelling and displays motion in some of its parts. This object itself must move in a circular path through the scene. You must use various elements of user interaction, for example controls to set the radius or speed of the object, dialog boxes to control material properties, etc. **[35 marks]**

Two prizes will be made available: one for the visually most striking application, and one for the most garish one - preferably by design. Prize winners will be invited for coffee and cake of their choice.

[35 marks total]