SET08116 Computer Graphics

Coursework Specification

The aim of this coursework is to create a 3D scene using OpenGL. The coursework constitutes **60% of the overall assessment of the module**. The choice of scene that you decide to implement is up to you, but you should develop a sufficiently complex and original scene (i.e., not the same as a colleague or one from a tutorial) to meet the coursework requirements. There are various standard scenes that can be generated from the graphics rendering literature – so I suggest you investigate these.

Submission:

- **Videos**
- **Report PDF (SIGGRAPH two column technical paper format (e.g., abstract, teaser, introduction, and screenshots) – note, you need to submit a PDF, no other format will be accepted**
- **Source Code (using the graphics framework)**
- **Screenshots**

There are some constraints to the scene that you will develop:

- You need to design your scene in some manner. Using tools such as Microsoft Visio, 3D studio max, or Photoshop is acceptable. You may also try and recreate a real world scene.
- You need to provide screenshots of your scene from multiple camera viewpoints. This will require the use of multiple cameras in the scene.
- You should compare your original scene design to your final scene design.
- Your scene should feature multiple instances of geometric objects. It must also have lighting and texturing effects in place. **This is the minimum requirements for the coursework**. (Note, there are **no marks for loading a model** into your scene or creating a meshes using modelling packages. You must be able to demonstrate you understanding fundamental underpinnings, such as, transforms, multi-texturing (e.g., combining textures on a single mesh), lighting models, and so forth).
- You should also attempt to implement some post-processing effects.
- **Your scene must use the rendering framework developed during the practical part of the module. This framework is built using C++ and OpenGL.**
- You **need to write a report** (pdf in the SIGGRAPH format). This should include the design and evaluation of your scene, and any other relevant information. More details are available in the marking schedule.
- **All coursework needs to be demoed to the module leader. This is to provide you with some initial feedback on the scene you have developed.**

The basic requirement is that other users (aside from yourself) must be able to use your application, therefore some interaction is required. Your scene does not need to be a full, exhaustive and complete implementation of the scene design, but it should implement the basic qualities of the scene you have chosen to implementation.

The coursework itself is separated into **two parts** which have to be submitted separately:

- **Part 1** (due **March (week 8)**) – a scene using lighting and texturing effects with a short report (i.e., SIGGRAPH format, abstract, introduction, conclusion, sections, outlining basic design/aim for the final submission). This is worth **40% of the coursework** mark

  Deliverables for Part 1: Submit a working program and source code and a short pdf report in SIGGRAPH template.

- **Part 2** (due **April (week 14)**) – your scene with post-processing and other effects. **You must also submit a report on your scene**.

  Deliverables for Part 2: Final polished implementation, source code, video, technical report pdf, and screenshots.

Marking Scheme

The first part of the coursework must be submitted electronically via Moodle by **Friday 6th March**. The submission must include all the code beyond the standard render framework and any resources you have used (e.g. textures).

The second part of the coursework (submitted report and complete code project with any required build instructions) must be submitted on Moodle by **Friday 3rd April.** You **must demo your coursework** during the practical session on **Tuesday 31st March/Wednesday 1st April**.

Any **late submissions** that are not authorised by your Programme Leader will be **capped at 40%.** Any evidence of plagiarism will be submitted to the School misconduct officer for possible disciplinary procedure.

The assignment is worth **60%** of the total module marks. Your assignment will be marked as follows:

Component	Description	Mark
Implement a scene using OpenGL	The scene must be made up of multiple pieces of geometry. The scene must also have lighting and texturing effects in place. Your scene should also implement at least two different cameras. This is the minimum requirement to pass the module.	40
Post-processing	You should implement a post-processing effect on your scene. The post-processing effect to use is your choice, but additional marks are given for researching and implementing a post-process not discussed in the practical.	20
Additional rendering techniques	Going above and beyond the general coursework requirements. This can include techniques such as, skyboxes, terrain, water effects, geometry shader, level-of-details. Good marks are given for researching and implementing a technique not given in the practical.	20
Report and evaluation	Your report should include a design for your scene, and an evaluation on how well your scene meets the design. Good marks are given for showing where the inspiration for your scene came from. Performance evaluation using gDebugger and research background for any additional effects used will also be rewarded. The only code samples should be for researched effects.	20

	Submission of printed code for standard techniques is not considered.	
Total Marks		100

Note that you are expected to spend **approximately 60 hours completing this assignment**. How you split this time up depends on the scene you try to implement. However, you should aim to spend 10 hours a week working towards completing this coursework, including time spent on practical work.

The coursework should be a lot of fun. Use your imagination and give your creativity a free rein! **Invention and originality will be rewarded by the marking scheme**. I hope you enjoy working on it.

Remember, you're required to submit a high quality report, screenshots, and professional videos emphasising your graphical submission – in addition to source code that can be compiled without intervention.

Details:

- SIGGRAPH Document Details: http://www.siggraph.org/learn/instructions-authors
- The final submission should be uploaded on Moodle (zip the files together, such as, the pdf report, videos, screenshots, and source code)