UNIVERSITY OF Hull

DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

ASSESSMENT COURSEWORK DESCRIPTION 2020/21

MODULE DETAILS:

Module Number:	500079	Trimester:	2
Module Title:	3D Computer Graphics		
Lecturer:	Dr Xinhui Ma & Dr Qingde Li		

COURSEWORK DETAILS:

Assessment Number:	2	of	2	
Title of Assessment:	DUNGEON GAMES GRAPHICS EFFECTS IN GLSL			
Format:	Program	Report		
Method of Working:	Individual			
Workload Guidance:	Typically, you should expect to spend between	50	and	60	hours on this assessment
Length of Submission:	This assessment should be **no** more than: *(over length submissions **will be** penalised as per University policy)*	1000 **words** *(excluding diagrams, appendices, references, code)*		

PUBLICATION:

Date of issue:	26 March 2021

SUBMISSION:

ONE copy of this assessment should be handed in via:	Canvas		If Other (state method)	
Time and date for submission:	**Time**	2pm	**Date**	14 May 2021
If **multiple hand–ins** please provide details*:*				
Will submission be scanned via TurnitinUK?	No	If submission is via TurnitinUK, these should be one of the allowed types e.g. Word, RT, PDF, PPT, XLS etc. Specify any particular requirements in the subumission details Students MUST NOT submit ZIP or other archive formats. Students are reminded they can **ONLY** submit **ONE** file and must ensure they upload the correct file.		

The assessment must be submitted **no later** than the time and date shown above, unless an extension has been authorised on a *Request for an Extension for an Assessment* form: search 'student forms' on https://share.hull.ac.uk.
Canvas allows multiple submissions: only the **last** assessment submitted will be marked and if

submitted after the coursework deadline late penalties will be applied.

MARKING:

Marking will be by:	Student Name

ASSESSMENT:

The assessment is marked out of:	100	and is worth	50	% of the module marks
N.B If multiple hand-ins please indicate the marks and % apportioned to each stage above (i.e. Stage 1 – 50, Stage 2 – 50). It is these marks that will be presented to the exam board.				

ASSESSMENT STRATEGY AND LEARNING OUTCOMES:

The overall assessment strategy is designed to evaluate the student's achievement of the module learning outcomes, and is subdivided as follows:

LO	Learning Outcome	Method of Assessment *{e.g. report, demo}*
1	*Demonstrate a practical understanding of graphics hardware.*	Program, Demo
2	*Implement an efficient real-time graphics application.*	Program
3	*Provide evidence of knowledge and understanding of 3D graphics and rendering techniques.*	Program, Demo
4	*Apply appropriate mathematical techniques to solve graphical problems.*	Program, Demo

Assessment Criteria	Contributes to Learning Outcome	Mark
quality of graphics rendering	1, 2, 3, 4	40
quality of transformation and animation	2, 4	40
novelty features and overall visual quality	2, 3, 4	15
quality of report	3, 4	5

FEEDBACK

Feedback will be given via:	Feedback sheet	Feedback will be given via:	
Exemption (staff to explain why)			
Feedback will be provided no later than 4 'teaching weeks' after the submission date.			

This assessment is set in the context of the learning outcomes for the module and does not by itself constitute a definitive specification of the assessment. If you are in any doubt as to the

relationship between what you have been asked to do and the module content you should take this matter up with the member of staff who set the assessment as soon as possible.

You are advised to read the **NOTES** regarding late penalties, over-length assignments, unfair means and quality assurance in your student handbook, which is available on Canvas.

In particular, please be aware that:
- Up to and including 24 hours after the deadline, a penalty of 10%
- More than 24 hours and up to and including 7 days after the deadline; either a penalty of 10% or the mark awarded is reduced to the pass mark, **whichever results in the lower mark**
- More than 7 days after the deadline, a mark of zero is awarded.

- The overlength penalty applies to your written report (which includes bullet points, and lists of text. It does not include contents page, graphs, data tables and appendices). 10-20% over the word count incurs a penalty of 10%. Your mark will be awarded zero if you exceed the word count by more than 20%.

Please be reminded that you are responsible for reading the University Code of Practice on Academic Misconduct through the Assessment section of the Quality Handbook (via the SharePoint site). This govern all forms of illegitimate academic conduct which may be described as cheating, including plagiarism. The term 'academic misconduct' is used in the regulations to indicate that a very wide range of behaviour is punishable.

In case of any subsequent dispute, query, or appeal regarding your coursework, you are reminded that it is your responsibility to produce the assignment in question.

Assessment Description

Please turn to next page for the detailed coursework descriptions.

500079 Assessment 20/21 – ACW2

DUNGEON GAMES GRAPHICS EFFECTS IN GLSL

The aim of the assignment is to provide you the opportunity to gain the practical experience of implementing some advanced graphics effects by writing a set of shaders. In this assignment, you are required to design and implement in GLSL a set of graphics effects which can be used for creating special visual effects in a dungeon-based game, such as the Dungeon of Dragon Knight game shown in the link: https://store.steampowered.com/app/823610/Dungeon_Of_Dragon_Knight/. All the effects should be integrated as one single graphic scene involving multiple drawing passes and displayed using RenderMonkey™ Toolsuite. If you do not want to use RenderMonkey, you can also complete the assignment in C# using OpenGL based on what you have achieved in ACW1, but your achievement will be assessed entirely based on the quality of your GLSL programs used in your C# OpenGL program.   .

https://store.steampowered.com/app/823610/Dungeon_Of_Dragon_Knight/

Here is the list of effects that need to be implemented:
1. BASIC EFFECTS (50%):
    1) Textured Dungeon floor, walls, and ceiling. (5%)
    2) A textured wooden table in the middle of the Dungeon. (5%)
    3) Bumpy stony Dungeon walls rendered using a certain bump mapping technique. The marks for this effect depend on the level of difficulty of the bump mapping technique you used, which can be
       o normal mapping; (6%);
       o or height mapping; (8%);
       o or ray marching-based parallax mapping. (10%)
    4) A rusty metal teapot sitting on a wooden table. The teapot should be illuminated using the normal mapping technique to give a rusty and bumpy look of the teapot. (5%)
    5) A walking Dino in the middle of dungeon floor rendered using perfragment lighting technique. The Dino modle can be found from within the RenderMonkey application.

(total 10%: 5% for illumination + 5% for animation)

    6) An animated fire in the fireplace similar to the one shown in the above image. (7%)
    7) One or two flying avatars generated by deforming some simple tringle meshes, like sphere and teapot. (8%)

2. OWN EFFECTS AND NOVELTY FEATURES: (10%)

    Create some of your own novel graphics objects to enhance the dungeon scene visual effect, for example, fire and explosions shown in the video provided in the webpage of the Dungeon of Dragon Knight game.

3. ADVANCED EFFECTS (30%)

    To achieve first class marks, the following effects may need to be considered

1) A set of animated dungeon torch fires hanging on the dungeon walls. These fires should locally illuminate the surrounding areas of the dungeon walls. (10%)
2) A glowing ghost object using either your own model or a model provided in RenderMonkey software package. (10%)
3) Scaling the Dino model into a proper size and animate a burning Dino model. (10%)

4. OVERALL VISUAL EFFECT (5%)

All effects implemented individually in different passes should be carefully coordinated and integrated to create an appealing dungeon atmosphere.

REMARKS

The geometric models and textures provided in Rendermonkey Toolsuite are sufficient for the completion of the coursework. You are allowed to use geometric models and textures either downloaded from the internet or made by yourself, but your work will be assessed mainly against the quality of your **shader programs** and **graphics effects**, **NOT** the number of passes and objects rendered.

WHAT TO SUBMIT

1. A short report (worth the remaining 5% of this assessment) to describe what you have achieved and how each effect is implemented. **Illustrate** each of your effects with some **screenshots**.
2. Submission of your program.
   a. If your work is based on RenderMonkey
      - Export your Rendermonkey program using the Rendermonkey's Package Exporter (File->Export->Package Exporter), which will generate a zipped file containing all your effect resources.
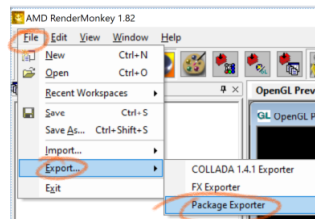
   b. If you work is done in C# with Visual Studio 2017. Please zip you entire VS2017 projects, including all required resources, the set of shaders, geometric models and textures used in your program.
   c. Further compress your report and your Rendermonkey/C# program into a zipped file and submit it on to **Canvas.** Please **name your final zipped file in the following form: Your Surname_Initials**. For instance, the filename of the final submission from a student named 'John Smith' should be named as 'Smith_J.zip'.