

DEPARTMENT OF COMPUTER SCIENCE

ASSESSMENT DESCRIPTION 2011/12 (EXAM TESTS AND COURSEWORK)

MODULE DETAILS:

Module Number:	08968	Semester:	2
Module Title:	Advanced Rendering and AI for Games		
Lecturer:	QL		

COURSEWORK DETAILS:

Assessment Number:	1	of	2
Title of Assessment:	Avatar Game Graphics Effects In HLSL		
Format:	Program	Report	
Method of Working:	Individual		
Workload Guidance:	Typically, you should expect to spend between	55	and 65 hours on this assessment
Length of Submission:	This assessment should be no more than: (<i>N.B. over length submissions will be penalised</i>)		1500 words (<i>excluding diagrams, appendices, bibliography, code</i>)

PUBLICATION:

Date of issue:	Friday 17/02/2012
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SUBMISSION:

ONE copy of this assessment should be handed in via:	White Box		If Other (state method)	
Time and date for submission:	Time	9.30am	Date	Thursday 22/03/2012
If multiple hand-ins please provide details:				

The assessment should 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* (Mit Circs) form which is available from the Departmental Office (RB-308) or <http://intra.net.dcs.hull.ac.uk/student/exam/Advice%20regarding%20resits%20in%20modules%20passed%20by%20compe/Forms/AllItems.aspx>. Your extension form should be submitted to the Departmental Office (RB-308).

MARKING:

Marking will be by:	Student Name
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COURSEWORK COVERSHEET:

BEFORE submission, you must ensure you complete the correct departmental ACW cover sheet (if required) and attach it to your work, dependant upon whether the coursework is being marked by student number, student name, group number or group name. The coversheets are obtainable from the departmental student intranet at http://intra.net.dcs.hull.ac.uk/student/ACW%20Cover%20Sheets/Forms/AllItems.aspx	Complete Student Name Coversheet
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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	<i>Design 3D graphics programs for photorealistic graphics</i>	program, report
2	<i>Demonstrate the concepts underpinning pixel and vertex shaders</i>	program, report
4	<i>Implement graphics software using pixel and vertex shaders</i>	program
5	<i>Implement software for photorealistic rendering</i>	program

Assessment Criteria	Contributes to Learning Outcome	Mark
Quality of overall visual effect	1,2,4,5	10
Quality of rendering	1,2,4,5	35
Quality of animation	1,2,4,5	35
Quality of shader codes	1,4,5	15
Quality of report	1,2	5

FEEDBACK

Feedback will be given via:	Mark Sheet	Feedback will be given via:	
Exemption (staff to explain why)			

Feedback will be provided no later than 4 'semester 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, also available on the department's student intranet at: <http://intra.net.dcs.hull.ac.uk>. In addition, **please note** that if one student gives their solution to another student who submits it as their own work, **BOTH** students are breaking the unfair means regulations, and will be investigated.

In case of any subsequent dispute, query, or appeal regarding your coursework, you are reminded that it is your responsibility, not the Department's, to produce the assignment in question.

(Please find assignment details overleaf)

Avatar Graphics Effects In HLSL

The aim of the assignment is to provide you with opportunities to take advantage of modern programmable GPUs to design and implement graphics effects required in an avatar game. You are required to write various special visual effects as a set of shaders in HLSL and display them in RenderMonkey. All these effects should be implemented as different passes under a single effect group.

The geometric models, such as fighting jets, characters, guns, used in your effects can be created directly from some geometric models provided within RenderMonkey or DirectX SDK by performing certain geometric deformations and transformations. The variety of shapes, appearances and behaviours of various objects in the game should be achieved mainly by writing a set of shaders using certain well established computer graphics techniques, rather than by using different geometric models and textures. However, you are allowed to use your own and third party geometric models and textures to enhance the overall visual quality of your graphics scene, but your work will mainly be assessed according to the quality of rendering, deformation and animation, not the number of geometric models used.

1. Basic Effects(50%)

The basic effects may include, but are not limited to:

- a. **Environment** created using the *cube mapping* technique; (5%)
- b. Bumpy stony **mountain** using a certain *bump-mapping* technique; (6%)
- c. Various kind of deformed and properly rendered **teapot-like** geometric objects in the scene:
 - 1) A **shiny** flying fighting jet; (6%)
 - 2) A **bumpy** walking artificial creature; (6%)
 - 3) A **metal** land vehicle; (6%)
 - 4) A **texture mapped** flying bird; (6%)
- d. **Fire/smoke/explosions** rendered with either *particle systems* or texture-based animation techniques; (15%)

2. Advanced Effects (35%)

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

- a. Animated tongues of fire jetted from the tail of the flying teapot-jet and missiles.
- b. Animated tongues of fire and bullet trajectory from the mouth of the walking artificial creature.
- c. Synchronized behaviors between flying missiles and explosions.
- d. Synchronized behaviors between the bullets fired from the mouth of the walking artificial creature and the explosions.
- e. Any effects of your own for enhancing the realism of the Avatar game.

3. Overall visual effect (10%)

Different objects must be carefully coordinated and properly sized and positioned to create a nice scene layout. The rendering parameters and states for different effects must be carefully configured and tuned to generate a visually harmonious scene.

Please refer to the following online video clips to get a sense of the graphics effects described above:

<http://www.youtube.com/watch?v=3x203DhjIKQ&feature=related>

<http://www.youtube.com/watch?v=F4LZSXbWJcw>

http://www.youtube.com/watch?v=bMwIBzbD_ow

What to submit:

- a. A short report (worth 5%) to describe what effects you have successfully achieved. Please illustrate each effect with a screen shot and briefly explain how the effect has been implemented.
- b. Export your graphics effects using RenderMonkey's package exporter. Rename the exported zip-file **using your surname**.
- c. Burn both the exported zip-file and your report on to a CD and submit via White Box.

08968 HLST ACW Marking Sheet

Student Name and number:

Effects Attempted		Rating	Marks
Basic Effects	a) Environment	.....	/5
	b) Mountain	.....	/6
	c) Flying jet	.....	/6
	d) Walking Creature	.....	/6
	e) Land vehicle	.....	/6
	f) Bird	.....	/6
	g) Fire Smoke Explosions	.....	/15
Optional and own Effects	a) Effect 1	.....	/7
	b) Effect 2	.....	/7
	c) Effect 3	.....	/7
	d) Effect 4	.....	/7
	e) Own effects	.....	/7
Overall visual quality		.....	/10
Report		.....	/5
Total			

Brief comments: