Durham University

Computer Science

Summative Assignment

Module code and title	COMP4097 Advanced Computer Graphics and Visualisation
Academic year	2022/23
Submodule title	Advanced Computer Graphics
Coursework title	Advanced Computer Graphics Coursework
Coursework credits	5 credits
Lecturer	Frederick Li
Deadline*	Thursday, January 19, 2023 14:00
Hand in method	Ultra

Additional coursework files	*N/A*
Required submission items and formats	*Submission should include a report (pdf file), implementation with all source codes and resource files, a readme file showing instructions of how to run the implemented program and what external resources you have adopted, and a 1-minute video showcasing representative features of the implementation. All files should be compressed into a single zip file and upload it to Blackboard Ultra for submission.*

*** This is the deadline for all submissions except where an approved extension is in place. Late submissions received within 5 working days of the deadline will be capped at 40%. Late submissions received later than 5 days after the deadline will received a mark of 0.**

COMP4097 – Advanced Computer Graphics (ACG)
2022-23 Summative Coursework

This coursework requires you to demonstrate the ability of using ACG techniques to model different types of objects and optimise their rendering performance while maintaining efficient rendering quality. You should therefore construct a virtual 3D school campus environment that comprises both indoor and outdoor scenes for a user to navigate with good visual quality and rendering performance supported.

Specifically, you are expected to apply multi-resolution modeling, parametric curves and surfaces and skeletal animation to construct both the scene and the objects constituting the 3D environment. Your implementation should be capable of optimizing computation time while maintaining good rendering quality. You can decide the scale of the 3D environment, the number/types/complexity of objects, and their representations, so that you can demonstrate how well your implementation can meet the marking criteria. To demonstrate you have an excellent or outstanding mastery of advanced computer graphics (ACG) techniques, you can further apply multiple ACG techniques in modeling the same type of objects (or object motions) or apply the same ACG technique in modeling different types of objects (or object motions).

Marking criteria:

1. Report and 1-minute video (10%)
2. Virtual environment construction (15%)
3. Application of multi-resolution modeling (20%)
4. Application of parametric curves and surfaces (20%)
5. Application of skeletal animation (20%)
6. Visual quality control (15%)

The levels of achievement of each marking criteria are determined as follows. They are developed based on the marking and classification conventions published in pp.15-16 of the university core regulations. (https://www.dur.ac.uk/resources/university.calendar/volumeii/2022.2023/coreregsug.pdf)

Levels of achievement of each marking criteria:	**Range of Marks**
No submission or clearly not your own contribution	0%
Inadequate, incomplete submission	0 - 40%
Satisfactory to Good (in terms of correctness and demonstrating an extensive usage of graphics library features without significant original contributions or a limited application of ACG techniques)	40 - 60%
Very Good to Excellent (in terms of original contributions, completeness, and showing various applications of ACG techniques in object / scene modeling and rendering performance enhancement)	60 – 80%
Outstanding to Perfect (in terms of original contributions, completeness, showing a complicated application of ACG techniques in object / scene modeling and rendering performance enhancement)	80 - 100%

***Note:** Your work must be done by yourself and comply with the university rules about plagiarism and collusion. (https://www.dur.ac.uk/learningandteaching.handbook/6/2/4/)

Submission:

You should submit a report explaining how your implementation meets marking criteria 2 to 6. The explanation against each marking criteria is limited to 50 words. For implementation, you are required to use three.js (https://threejs.org/). The coursework contributes 50% of the module assessment. Submission date is 19th January 2023 (2pm).

Your submission should include a report (pdf file), your implementation with all source codes and resource files, a readme file showing instructions of how to run your program and what external resources you have adopted, and a 1-minute video showcasing representative features of your implementation. You should compress all files into a single zip file and upload it to Blackboard Ultra for submission.

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