Department of Computer Science

Assessed Coursework Assignment Brief

Module code: **CS3VR16 and CSMVR16**

Lecturer responsible: **Prof Richard Mitchell**

Coursework description: **Task 2 - Immersive Virtual Environment**

Work to be submitted on-line via Blackboard by 12:00 noon on: March 21st 2018

Work will be marked and feedback returned by: Apr 11th 2018

Extra Report for CSMVR16

- submit by 12:00 noon March 23th 2018 – will be marked by Apr 11th 2018

This coursework should be submitted on-line through Blackboard Learn.

Each group should submit ONE compressed ZIP file of your Group's working Unity.exe, the associated _Data folder with its appropriate files and the report specified below.

In addition, each student should submit a brief report (detailed below) on your individual contribution. MSc students should submit the extra report (detailed below).

NOTES:

By submitting this work you are certifying that it is all your own work and that use of material from other sources has been properly and fully acknowledged in the text. You are also confirming that you have read and understood the University's Statement of Academic Misconduct, available on the University web-pages.

If your work is submitted after the deadline, *10%* of the maximum possible mark will be deducted for *each* working day (or part of) it is late. A mark of zero will be awarded if your work is submitted more than 5 working days late. You are strongly recommended to submit work by the deadline as a late submission on one piece of work can impact on other work.

If you believe that you have a valid reason for failing to meet a deadline then you should complete an Extenuating Circumstances form and submit it to the Student Information Centre *before* the deadline, or as soon as is practicable afterwards, explaining why.

WEIGHTING

For CS3VR16

> This assignment is worth 75% of the whole coursework (itself worth 30% of the marks of the module), the report and the associated individual work is worth 60% of this and the group simulation is worth 40%.

For CSMVR16:

> This assignment is worth 65% of the marks for the whole coursework, again 60% comes from the report and individual work, 40% from the group simulation.
>
> The remaining 10% of the marks for the module come from an extra report which is detailed below.

ASSIGNMENT DETAILS

This task is to be undertaken in groups of typically 5 or 6 people, but although you are working as a group, it is important that each member has a specific task to do – which you will write up individually as a short report.

The assignment is to develop an immersive virtual environment in a context that you cant do normally in this world. It should be 'realistic' in the sense it must behave consistently within your 'virtual world'. You are free to choose any topic, but it must be follow this context.

> One example would be an implementation of an impossible world (eg based on one of Escher's woodcarvings) I would love an implementation of 'other worlds' which I use to explain different parts of cybernetics, where users can go through the arches.
>
> It could be a fantasy world – or on another planet, say with different gravity.
>
> Another option is to have a 3D model of the brain which users can take apart – and a colleague from Psychology, Peter Scarfe, has some data you can use and would be prepared to help you. A separate document is on Blackboard about this.
>
> Or you could choose something else.

Note, whatever you choose should be developed specifically for the module – you cannot use work you have been doing for your project, for instance.

You should first meet with your group and decide what you are going to build. It doesn't matter what your simulation is intended to do. The key point is the simulation should be designed with a definite purpose in mind.

You will be expected to be able to demonstrate your knowledge of the core Virtual Reality concepts which are covered in the course. In particular, 'human' concepts such as: realism, believability and usability, and technical concepts such as: lighting, physics/animation and geometry. Remember, the purpose is not to create a photorealistic animation, but to use the tools available to create an interactive, believable simulation.

You should try to consider the following design goals in both your group project and the final report: Interactivity (Intuitive, Simple), User Experience (Immersion & Presence), Design (Realism Vs Believability), Purpose (Application & Functionality)

Once you have a plan, assign different responsibilities to each member and agree a timeline. You will need to work closely to ensure the different aspects work properly together.

The overall project will typically be achieved using a variety of products, but coordinated with Unity. So for instance detailed models of the environment or characters imported into it could be built with SketchUp, Blender, Maya or SolidWorks, or similar. Divide the tasks accordingly to each person's expertise.

The final program should be submitted in a **ZIP** file containing the Unity application, the associated folder with relevant files, and a single sheet (up to 2 sides of A4) called the Group Document.

The required documentation is detailed below.

Whilst I will want to be able to view the world on a standard computer, if a version exists which runs on a headset (eg Oculus Rift), that should also be submitted and would attract marks.

Group Document

This should contain the following

- Title of World;
- Aims of World;
- Screen shot(s);
- Instructions on how to use it.

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The Individual Report

The Individual report, which should be no more than 1500 words, excluding references and diagrams, should describe your individual contribution to the project, saying what you have done and why, and how you have attempted to incorporate different virtual reality concepts.

The following is a suggested structure for your report. There may be other relevant sections depending on your particular project and your contribution. The mark scheme assumes this structure but will be adapted if necessary.

Introduction:
Introduce briefly the report; give the structure and a summary of the whole project.

Background/Motivation:
Set the scene; provide necessary background for the reader to understand your contribution to the project and how it fits with the overall project.
Consider: What, why, how. What does this work build on? Is there other work in the academic literature? Outline related work.

Design/Requirements Analysis:
You didn't just randomly throw things together (hopefully), there was a coherent plan behind the strategy you used for your contribution, which involved considering the problem carefully and designing your environment/ interaction to solve the problem. Describe this/

Testing:
How do you know if your solution is effective? How did you establish this, did you have a testing plan, a table of requirements and necessary functionality? Did you get impartial subjects to try the system and report on their experience?

Results:
Discuss which aspects of your design which met your test criteria, and which need more work.

Reflection:
Consider: Critically evaluate your work (as a whole and on your personal contribution), what was achieved, what were the problems and challenges, what has been learnt. Reflect on the questions posed at the start of the project and your attempts to provide an answer.

Further Work:
Here you can describe where you would take this simulation given sufficient time and resources, how you would improve it and what it might be used for. Show that you are aware of the limitations, both what you have developed and hardware and software available to you.

MARKING CRITERIA

The table below shows the mark scheme for the Group Assessment

Part of Group Submission	**Marks available**
Interactivity (Intuitive, Simple),	20
User Experience (Immersion & Presence),	20
Design (Realism Vs Believability)	15
Purpose (Application & Functionality)	15
Originality (including working on headset)	20
Documentation	10

The table below shows the mark scheme for the Individual Report if you follow the suggested structure (see later for more details on the report).

Part of Individual Submission	**Marks available**
Introduction	10
Background/ Motivation	20
Design/Requirements Analysis	20
Testing	10
Results	10
Reflection	20
Further Work	10

For CSMVR16

You are to get some people to try out your Virtual Environment and to feedback to you what they think about it. For this you should design a questionnaire that assesses what each person feels about the VE: for instance to what extent it achieves its aims, do the feel immersed, etc. Document their responses.

Then write a short report up to four pages, with an introduction in which can refer to the Group and Individual reports already submitted, section describing the questions and their answers, a discussion on their responses leading to suggestions for changes to be made to the project, and a brief conclusion.

This will be marked by

Part of Submission	**Marks available**
Introduction	20
Questions and Responses	30
Discussion	40
Conclusion	10