

The University of Melbourne
School of Computing and Information Systems
COMP30019 Graphics and Interaction

Set: Monday 28th August

Project 2, 2017

Gameplay Video (1-2 minute video): 4pm, Fri. 13 October
Final Electronic Submission (project): 4 pm, Wed. 25 October

Marks: This project counts towards 30% of the marks for this subject

Participants: This can be done either individually or in groups of 2-3 people.

Assessment: Marking will be the same regardless of the number of participants.

Aim

The purpose of the project is to expose you to user interfaces and three-dimensional graphics programming. You will develop a **simple game** using Unity. You are free to choose any type of game that your group would like to develop, and we are happy to discuss these possible projects with you before you begin implementation.

Your Task

Your task will involve questions of

1. how to facilitate user interaction,
2. how to create and render objects/entities,
3. how to elegantly provide a camera which sensibly displays the action,
4. how to effectively manage the graphics pipeline so that it runs without substantial lag.
5. how to evaluate your game with participants, and make improvements based on the collected information.

Specification and Marking Criteria

As stated above, we have provided you with a great deal of freedom in what you make. In particular, you are not necessarily required to implement *all* of the entities and functions present in your intended game if you choose not to. For example, you may choose to only utilise a core subset of functionality. However, the game must still be usable/playable.

A game that meets all of below criteria will receive 30 marks:

Gameplay [8 marks]

- Controls are well specified and respond as expected [2 marks]
- The game has a clearly defined objective, with the player being able to progress towards and achieve that objective [2 marks]
- Gameplay is well executed, bug-free, and operates at a reasonable frame rate (sufficient to play the game) [2 marks]
- The gameplay and control scheme are polished, easy to use, enjoyable and suit the design of the game [2 marks]

Computer Graphics [5 marks]

- Objects and entities clearly visible, clearly distinguishable, and suit the style of the game (e.g., different shapes, colours and lighting) [2 marks]
- Correct 3D transformations for object/camera motion [3 marks]

Lighting & Shading Calculations [10 marks]

- At least two clearly distinct custom Cg/HLSL shaders are used which appropriately enhance the game's visuals. At least one shader should produce an effect *not* explored in the labs. For example, cel shading, water effects, or other artistic effects as desired. Descriptions of how the shaders work are clearly detailed in the report. [8 marks]
- A particle system is used to create effects within your game. [2 marks]

Evaluation and Improvements [7 marks]

- Use at least one querying technique to evaluate and then improve your game, with a minimum of 5 participants. [3.5 marks]
- Use at least one observational method to evaluate and then improve your game, with a minimum of 5 participants. [3.5 marks]

Please note that it is not necessary for the lighting and shading effects described above to be implemented for *all* objects within your game. It is, however, required that they be clearly visible within the game and well documented in your report.

Consultation via Discussion Forum

You are encouraged to ask questions, answer questions where possible and share examples of pseudocode and/or small examples of code that highlight the correct invocation of Unity commands or algorithmic/graphical/interaction techniques.

You are not allowed to exchange complete methods or classes. Remember that copying code from the Internet or from your colleagues will be considered cheating. Note that via electronic submission, your code will be checked for similarity between submissions and with code available over the Internet.

Milestones

- Establish a set of intermediate goals for your application (e.g. detailing the polygon mesh, camera transformations, evaluation, etc.) Break down the set into core functions and extras which you can attempt if time permits.

Submission (electronic submission)

Your code must compile and run on environment available in the tutorial rooms.

Gameplay Video: In order for everyone to be able to check your project in action, we request that you submit a short gameplay video to YouTube demonstrating the key features of your game (1 to 2 minutes long). You can set the video to unlisted if you wish to prevent it from being viewed publicly, but please ensure that we can access it from the provided link without requiring any special permissions.

Report: You must include a report (max. 3 pages) that describes your application, specifically what it does, how to use it, and how you evaluated and improved it. Several paragraphs of text under each of the following headings should be sufficient:

- Brief explanation of the game,
- How to use it (especially the user interface aspects)
- How you modelled objects and entities,
- How you handled graphics and camera motion,
- Descriptions of how the shaders work,

- Description of the querying and observational methods used, including:
 - 1) description of the participants (how many, demographics), description of the methodology (which techniques did you use, what did you have participants do, how did you record the data), and feedback gathered.
- Document the changes made to your game based on the information collected during the evaluation.
- A statement about any code/APIs you have sourced/used from the internet that is not your own.

Important: if your project contains code from other sources, in particular from other web sites, you have to clearly indicate this in the report. Identify which classes or methods are your own and which are from a different source. Remember that copying code from the Internet or from your colleagues will be considered cheating. We will be checking for similarity between submissions and with code available over the Internet.

Peer Assessment of Contribution

If you complete the project in a group, you will be required to provide an assessment of your contribution and your colleagues' contribution in LMS. This is mandatory and aimed at minimizing potential conflicts between members of a group, and providing a fairer grading scheme.

Delays

Make sure you deliver your work on time using LMS. Overdue delivery will result in a reduction of 10% of the marks for each day of delay.