
Coursework commentary

2018–2019

CO3355 Advanced graphics and animation

Coursework assignment 1

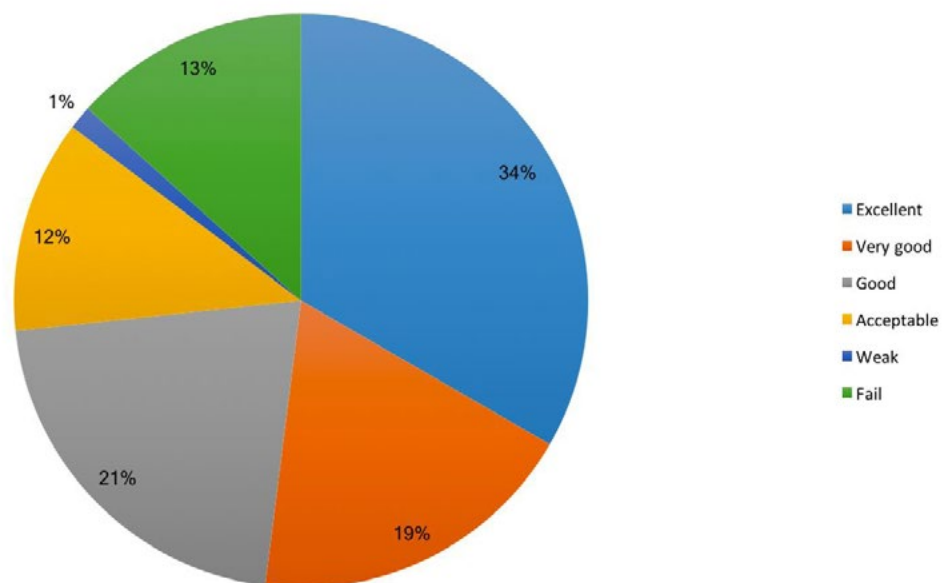
General remarks

This coursework assignment consisted of two parts, divided into three questions each. In Part A students were asked to experiment with the concept of height maps, familiarising themselves with basic 3D graphics techniques using Processing. Part B focused on colour shading techniques where students were asked to experiment with various time-varying effects.

Overall, the majority of submissions were of high quality, most of them completing both parts to a good extent. The most common problem was an imbalance between implementation and reporting; while on many occasions programming attempts were excellent, these were often not accompanied with reports of similarly high quality. We would like to point out the importance of a report that provides an adequate description of the implementation, exposes problems faced, justifies design decisions, provides evidence of the results achieved (such as by using screenshots from multiple viewpoints), and assesses and interprets them appropriately to demonstrate understanding and intuition.

See 2018–2019 cohort mark distributio0n for CO3355 CW1 below:

CO3355 CW1 Cohort mark distribution 2018-19



The examiners would also like to stress the importance of following the submission instructions in terms of positioning and naming files and folders. Moreover, in order for a Processing program to run correctly, it needs to be placed in appropriate folders, with the folder name being identical to the one of the main Processing executable. Additionally, students should not

forget to include all other necessary materials (such as GLSL and OBJ files) in appropriate folders. Finally, students are asked to confirm that their program runs before submitting, by extracting the compressed file to a separate location and verifying that it works as expected.

Comments on specific questions

Part A

This part dealt with the use of height maps in computer graphics to represent terrain information. A height map array was provided in a file.

Question 1

This question asked students to write code that draws the given height map as a Quad mesh and enables camera navigation by incorporating the PeasyCam library.

This was a rather straightforward question that was carried out well by most students. However, in some submissions there were problems with camera navigation. The most common challenge for those who did incorporate PeasyCam, was to achieve proper centering of the camera by translating to the centre of the screen. Moreover, setting the zoom boundaries in order to view the object was at times problematic.

Question 2

This question asked students to create their own terrain array by generating random values, which should include an adjustable number of 'peaks'.

The main issue here was not enabling interaction or not properly handling resolution in the height maps array, which often made results less prominent. On the other hand, most answers were very competent, with some going the extra mile of incorporating a Graphical User Interface for that purpose, though that was not required.

Question 3

In this question, students had to choose an appropriate greyscale image and use it as a heightmap in Processing. Here the image selection was important and simpler images with not much texture and clutter generally worked better. Another important and interlinked factor was resolution; the more detail the better the representation. Most students managed to approach these tasks well and provide a good answer here.

Part B

The second part of the assignment examined time-varying procedural texturing. The implementation was to be carried out in GLSL, so students needed to familiarise themselves with its basic concepts. One of the main challenges of this part was to understand how data can be passed to and between vertex and fragment shaders. The vast majority of those who did master these concepts produced very good results.

Question 1

In this question, students were asked to implement procedural patterns and render them on a torus object. A good answer could be built upon simple shaders as per the instructions in the subject guide, with the adoption of examples of fragment shaders from the online resource. Tiled patterns did not need to be sophisticated nor complex.

A relatively common problem observed was that the mapping was not happening on the torus itself and did not move together with the object. This was mainly due to the use of screen (rather than local) coordinates for calculating the texture.

Another, though not very common, issue was the implementation of texture mapping (i.e. using a raster image and wrapping it around the shape), instead of procedurally generating the texture.

Question 2

This question asked students to add variables to their code that modelled time and mouse position respectively, in order to animate the produced pattern. Students had to include these variables in both their Processing and GLSL code and pass them from the former to the latter. Then they had to modify the fragment shader patterns so that they depended on those variables. Any type of dependence was OK, as long as the patterns did change over time and with mouse movement. This was mostly well answered by those who attempted it.

Question 3

This question asked students to experiment with more sophisticated texturing patterns and see what effects they could produce. This part was open-ended and left some space for creative improvisation.

Students were expected to implement at least two, relatively advanced patterns and, as long as these were adjustable and varied over time, they could attract around half of the available marks. The remaining marks were awarded based on the extent of experimentation as well as the degree of sophistication and originality (extending and modifying patterns found elsewhere was fine, as long as proper credit was given to the source). Finally, another important characteristic of a good report was proper reflection and evaluation of the journey.

This was the least popular question of the coursework assignment, despite the fact that it carried the most marks. The answers varied in quality with respect to the aforementioned factors and included some with exceptionally creative results.