University of London International Programmes

Computing and Information Systems/Creative Computing

CO3355 Advanced graphics and animation

Coursework assignment 1 2017–2018

Part A (60%)

1. (30%) Write a Processing program that performs basic transformations, for example, Translation, Rotation and Scaling, on a given 3D object. Import and use a Processing library of your choice to create a simple Graphical User Interface (such as ControlP5 [1], G4P [2] or Guido [3]) and make the transformation parameters adjustable via appropriate GUI components. Use a camera such as peasycam [4] to enable navigation.

   Use your code on at least 3 different objects:
   - a cube (box) generated in Processing.
   - a torus (donut) shape, for which you can use the additional file getTorus.pde.
   - an object of your choice that you may have implemented yourselves in a 3D application or imported as an .obj file from an online resource.

   Experiment with the transformations, performing them in different sequences, and report on the results.

2. (30%) Now implement the same transformations using GLSL shaders. Integrate GUI elements to control the parameters, experimenting on the same objects as in Part A 1, and compare the results. Document your journey through this process and identify and expose any obstacles you encounter.

Part B (40%)

1. (10%) Create GLSL shaders that generate a rectangular grid pattern and project it on to a shape. Make the fragment shader include a variable that allows you to dynamically change the size of the rectangles, based on the mouse position. Demonstrate the results.

2. (30%) Experiment with different effects, including time-varying shapes and colours. Improvise and see what crazy effects you can produce. Demonstrate the results and comment on them. The Book of Shaders [5] can be a good source of ideas for experimentation.

[TOTAL 100%]

Notes
For every step of the coursework, provide screenshots from multiple viewpoints. Describe your modelling approach and expose the problems you faced and the design decisions you made. Also, include an assessment of how well the techniques you used apply to what you are trying to do, identifying advantages and disadvantages.

You can find a very comprehensive walk-through tutorial for shaders in Processing in [6].

Submission
Submit a single .zip file which contains:

- your coursework as a single .pdf. This should include listings of the software you have developed, with your own contributions highlighted and attribution for the remaining code (such as code taken from the subject guide or external sources). It is important that your submitted assignment is your own individual work and, for the most part, written in your own words. In addition to indicating any code re-use, you must provide appropriate in-text citation for any paraphrase and quotation, and give a detailed reference section at the end of your assignment (see: how to avoid plagiarism).
- all source code files that you have developed for this coursework, with instructions (as comments in the source files, or as a separate readme file) on how to run them.

When naming your .zip file ensure that you include your full name, student number, course code and assignment number:

YourName_SRN_COxxxxcw#.zip (e.g. MarkZuckerberg_920000000_CO3355cw1.zip)

- **YourName** is your full name as it appears on your student record (check your student portal)
- **SRN** is your Student Reference Number, for example 920000000
- **COXXXX** is the course number, for example CO3355, and
- **cw#** is either cw1 (coursework 1) or cw2 (coursework 2).

Your pdf file must be named using the above file-naming conventions, and include your full name, SRN, course code and assignment number.

References

[1] http://www.sojamo.de/libraries/controlP5/
[2] http://www.lagers.org.uk/g4p/
[3] https://github.com/fjenett/Guido
[4] http://mrfeinberg.com/peasycam/
[5] https://thebookofshaders.com/
[6] https://processing.org/tutorials/pshader/

[END OF COURSEWORK ASSIGNMENT 1]