University of London International Programmes
CO3355 Advanced graphics and animation
Coursework assignments 2016–2017

Coursework assignment 2

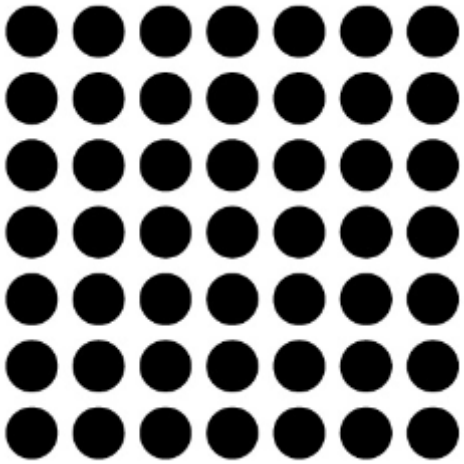
Part A (45%)

1. (35%) Write GLSL shaders that implement the (a) Phong [1] and (b) Blinn-Phong [2] shading models. Make sure you cater for ambient and diffuse together with specular reflection and make all model parameters adjustable by the user. Enable camera navigation and incorporate a point light that moves following the mouse position. Experiment by modifying the parameters of each model and demonstrate the outcome on different shapes. Discuss and evaluate the results.

2. (10%) Add a second light to your scene. Explore how you can combine the effects of multiple lights in each shading model.

Part B (55%)

1. (20%) Write code that generates a procedural texture of a grid of circles, such as the one shown below. Make the number and size of the circles adjustable by the user. Incorporate your lights and show the result.



2. (35%) Investigate how you can use noise (such as Perlin, Simplex or Worley) to help you create more interesting textures. Make them change over time and improvise to see what effects you can produce. References [3] and 0 might give you some ideas.

[TOTAL 100 PER CENT]

Notes
You may also use the additional files uploaded with this coursework (getTorus.pde and createCan.pde) that contain code to generate a torus and a cylinder shape respectively, or other objects of your choice, as long as they help you demonstrate the effects. Ideally, also perform your experiments using the composite shape you created for the first coursework.

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.

Please make sure that you use and cite your reference material appropriately in the body of your submission, with full details provided in a reference section at the end (see Harvard Referencing Guide).

Submission
Submit a single .zip file which contains:

- your coursework assignment as a single .pdf. This should include listings of the software you have developed, with your own contributions highlighted and an attribution for the remaining code (such as code taken from the subject guide or external sources)
- 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

e.g. FamilyName_SRN_COxxxxcw#.pdf (e.g. Zuckerberg_920000000_CO3355cw2.pdf)

- **FamilyName** is your family name (also known as last name or surname) as it appears in 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)

References

[1] https://en.wikipedia.org/wiki/Phong_shading
[2] https://en.wikipedia.org/wiki/Blinn-Phong_shading_model
[3] http://www.upvector.com/?section=Tutorials&subsection=Intro%20to%20Procedural%20Textures
[4] http://liu.diva-portal.org/smash/get/diva2:618262/FULLTEXT02.pdf

[END OF COURSEWORK ASSIGNMENT 2]