



School of Arts, Media and Computer Games

Session 2017/18

Module Code: **CMP301**

Module Title: **Graphics Programming with Shaders**

Module Deliverer: **Dr Paul Robertson**

Unit of Assessment: **Unit 1 of the module assessment – 100%**

Submission date: **Tuesday 5th December 2017.**

Suggested Feedback Return Date: **23rd January 2017.**

Feedback Type: **Feedback will be provided via Blackboard within a Rubric.**

Assessment overview

Task 1: Build a Graphics Application

You are to develop your own shaders and an accompanying application to demonstrate them. The scene created does not have to be overly large or populated; the focus is on the use of the programmable pipeline. The brief is designed to be as open as possible providing you the opportunity to develop something of your own interests and design. Ideally the coursework should demonstrate the use of all shader stages:

- Vertex
- Pixel
- Tessellation (including Hull and Domain)
- Geometry

The coursework should also demonstrate key graphical techniques such as:

- Vertex manipulation
- Post processing
- Lighting and shadows
- Tessellation
- Geometry manipulation and/or generation

Your project should utilise an object oriented approach with appropriated classes. All code should be well structured and well commented. You should differentiate your coursework from the examples provided in lectures and labs. The application must run on the lab computers.

The minimum requirements for this coursework are a working and non-trivial set of vertex and pixel shaders that demonstrate simple vertex and pixel manipulation (e.g. texture blending and lighting or post processing). You should aim to demonstrate all shader stages and as many of the above suggested features as possible for the best grade.

Task 2: Documentation

You must provide documentation for your application. This documentation should highlight how you addressed the coursework requirements. This documentation should include the following:

1. Information on user controls
2. Detailed explanation of the shaders created, algorithms and techniques used/demonstrated in the coursework. This should include; what shader stages are used, important data being sent to/from the shader stages, algorithms used in the shaders, explaining any calculations or manipulation done in the shader, providing diagrams, code snippets and screenshots as required
3. A critical reflection of your application. Discussion of any shortfalls of your application, areas of improvements, how you might extend the application. Offer possible solutions to the problems.
4. References for any code or techniques incorporated in your application. Cases of plagiarism will be taken very seriously.

There is no fixed page or word count for this document, but a sufficiently detailed document would be between 4-8 pages. Best practice is to write this document as if explaining to another student how your code works and is constructed.

Submission

Electronically via Blackboard by Tuesday 5th December 2017.

- The submission should include the source code/project, an executable file and documentation. These files should be contained within a zip file for uploading, using the following folder structure:

- A folder titled "source" containing the entire Visual Studio project. You can exclude the project SQL file and the "ipch" folder as these will increase the size of your submission but are not required.
- A folder titled "exe" containing the executable file and any shaders or other assets required for the project to run standalone.
- A folder titled "docs" containing a PDF of your documentation.

All submissions must be uploaded to the appropriate location within the Blackboard system. No coursework cover sheet is required for Blackboard submissions. You will be able to have multiple submissions (in case of errors) but only the last submission will be marked.

Marking scheme

Literal Grade	Evaluative Descriptor	This Assessment
A+	<p>Excellent overall.</p> <ul style="list-style-type: none"> • Demonstrates an excellent grasp of the subject matter. • Excellent capacity for original and creative enquiry. • Excellent ability to critically evaluate, analyse, synthesise and integrate complex information. • Excellent communication skills. <p>In addition, exceptional in at least one of the above.</p>	
A	<p>Excellent overall.</p> <ul style="list-style-type: none"> • Demonstrates an excellent grasp of the subject matter. • Excellent capacity for original and creative enquiry. • Excellent ability to critically evaluate, analyse, synthesise and integrate complex information. <p>Excellent communication skills.</p>	<p>A meticulously constructed application demonstrating all of the shader stages and utilising techniques discussed in class and researched by the student.</p> <p>Code is well structured and well commented.</p> <p>Documentation is well written, very detailed, with good critical reflection and correctly referenced.</p> <p>Application is well presented.</p>
B+	<p>Very good overall.</p> <ul style="list-style-type: none"> • Demonstrates a very good grasp of the subject matter. • Very good capacity for original and creative enquiry. • Very good ability to critically evaluate, analyse, synthesise and integrate complex information. • Very good communication skills. <p>In addition, excellent in at least one of the above but overall performance deemed to be very good.</p>	
B	<p>Very good overall.</p> <ul style="list-style-type: none"> • Demonstrates a very good grasp of the subject matter. • Very good capacity for original and creative enquiry. • Very good ability to critically evaluate, analyse, synthesise 	<p>A well-constructed application demonstrating many of the shader stages and utilising some of techniques discussed in class and some based on external research.</p> <p>Code is well structured and well</p>

	<p>and integrate complex information.</p> <p>Very good communication skills.</p>	<p>commented.</p> <p>Documentation is well written, detailed, with some critical reflection and correctly referenced.</p> <p>Application is presented well.</p>
C+	<p>Good overall.</p> <ul style="list-style-type: none"> • Demonstrates a good grasp of the subject matter. • Good capacity for original and creative enquiry. • Good ability to critically evaluate, analyse, synthesise and integrate complex information. • Good communication skills <p>In addition, very good in at least one of the above but overall performance deemed to be good.</p>	
C	<p>Good overall.</p> <ul style="list-style-type: none"> • Demonstrates a good grasp of the subject matter. • Good capacity for original and creative enquiry. • Good ability to critically evaluate, analyse, synthesise and integrate complex information. <p>Good communication skills</p>	<p>The constructed application demonstrates some of the shader stages and utilises some of the techniques discussed in class. Shows limited work outside that covered in class.</p> <p>Code is well structured and commented.</p> <p>Documentation is sufficiently detailed with few references and lacking sufficient critical reflection.</p>
D+	<p>Satisfactory overall.</p> <ul style="list-style-type: none"> • Demonstrates a satisfactory grasp of the subject matter but limited grasp in some areas • Satisfactory capacity for original and creative enquiry. • Satisfactory ability to critically evaluate, analyse, synthesise and integrate information. <p>Satisfactory communication skills</p>	
D	<p>Adequate.</p> <p>Achievement of all threshold standards but grasp of some subject areas and graduate attribute development may be more limited.</p>	<p>The application meets the minimum requirements. Lacking extra shader stages or complexity.</p> <p>Documentation describes the application but lacking in detail.</p>
MF	<p>Marginal fail.</p> <p>Performance just below the threshold standard. A reasonable expectation that a pass is achievable by reassessment without the need to repeat the module.</p>	<p>A very simple application that fails to meet the minimum requirements. Poor documentation lacking sufficient information on the application constructed.</p>
F	<p>Performance well below the threshold level. Some limited evidence of achievement of the outcomes.</p>	<p>No working application or little evidence of work. Documentation lacking detail or missing.</p>
NS	<p>No assessments submitted or no evidence of achievement of the outcomes.</p>	

