Graphics and Animation
Assignment 1

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1 View Ports and Shading

The aim of this assignment is to create multiple view ports to compare different types of representation of objects, namely, wireframe, and surface with flat, Gouraud and Phong shading. This assignment can be completed in any programming language that supports VTK. Please download and use one of the models from https://www.thingiverse.com. Alternatively, you could use any other royalty-free three-dimensional model to complete the assignment.

1. Read the 3D model using an appropriate reader, *i.e.,* `vtkOBJReader`, `vtkPLYReader`, or `vtkSTLReader`.

2. Create four view ports and render the 3D object with the shading and representations as shown below. Refer to example codes under *Lecture 02* and *Lecture 03* in eClass for creating multiple view ports and shading. You might want to rotate the object to see the effects of the shading. *Hint: You might want to compute normal vectors for the shading to work.*

View Port 1 Representation – Wireframe (No shading or texture)	View Port 2 Representation – Surface (Flat shading)
View Port 3 Representation – Surface (Gouraud shading)	View Port Representation – Surface (Phong shading)

3. Export the rendered scene to a JPG file. (Refer to the VTK documentation for `vtkJPEGWriter` and `vtkWindowToImageFilter` classes.)

1.1 Grading (8 Marks)

You are required to submit the following information for this assignment:

1. Provide the details such as name, file size, number of vertices of the model used for the assignment (25%)
2. A screen shot image showing the output (12.5%)
3. A commented source code (Please include the source code as a part of the report in human readable format) (50%)
4. A README section containing details on how to run the code and other information such as VTK version used for writing the code. (12.5%)

1.2 Submission

Please submit a report containing the information mentioned above as a PDF file via eClass on or before February 1, 2022. A penalty of 10% per day will be applied for late submissions. A blind marking approach will be used for grading the assignment and please do not include your name in the report or on the submission filename.