COMP 5411 : Advanced Computer Graphics
Fall 2017
Getting Ready for Programming Assignments
Not to be submitted

You are given the source code of a simple mesh loader and viewer program written in C++ and GLFW. The two programming assignments will be built upon this source code. The loaded mesh is stored using the half-edge data structure. You are advised to get ready for the programming assignments by getting acquainted with this data structure, basic OpenGL programming and UI programming. Some functionalities that you are recommended to implement are:

- *Basic mesh information.* After loading in a mesh, compute the number of vertices, half-edges (including boundary edges and their twin edges), faces, boundary loops, genus and connected components. The number of connected components can be found by using either a breadth-first-search or a depth-first-search graph traversal algorithm. To count the number of boundary loops, "walk along" the boundary edges to form complete loops. To compute the number of genus, you may apply the extended Euler formula $\chi(M) = v - e + f = 2(c - g) - b$ where b is the number of boundary loops and c is the number of connected components.

- *Vertex normals and shading.* Compute the vertex normals and perform smooth shading.

Please refer to the supplemental slides for more details. For compilation instructions, please refer to the previously released handout **OpenGL Intro** (`https://course.cse.ust.hk/comp5411/ogl_beginner/OpenGLIntro.pdf`). On Windows, the given sample source code can be compiled using Microsoft Visual Studio 2015 or higher editions.

You may contact the TA, Lei Li (`llibb@cse.ust.hk`, Room 4204), if you have any questions.