CS535: Assignment #3 – Sketching

Out: September 27, 2016
Back/Due: October 18, 2016

Objective:
This objective of this assignment is to combine your learned skills of shader/vertex programs with 3D modeling. You will add a “sketchy” feeling to drawn objects. You program will make use of the Asgn0 framework, including the OBJ loader, and the previous assignment GPU programming knowledge.

Algorithm:
You will load an object and draw it in each of the following three modes. For ‘b’ and ‘c’ you should consider a contrasting foreground and background color (e.g., black on white).

a. Gouraud shading: you will draw the model in the normal lighting and shading scheme using OpenGL. Each vertex will have a color (or a single color per object) and then shading and lighting will use per face or per vertex normals with a static light (or lights) in the scene.

b. Jittered lines: draw the model in wireframe but instead of drawing it with solid lines, replace each line segment with a “jittered” (or “shaken”) line that does not exactly start and end where it should. This most probably requires a vertex shader program. You may consider replacing a long line segment with a few shorter jittered line segments – this would likely happen in the modeling stage (i.e., before rendering starts).

c. Stroked lines: draw the model but texture map the lines so that they appear to be “strokes” from a library of at least two stroke textures. You may choose the stroke textures but they should be clearly different. To keep the strokes seemingly of the correct size you will likely need to breakup long lines into shorter ones so that the strokes are not excessively stretched. It is extra credit to omit lines that are interior to the silhouette (read below).

(some pics; we will indicate some recommended papers as well)
Some inspirational text can be found at:

For line drawing and jittered line drawing, this site is very helpful.  

For hand-drawn strokes, this paper explains a little but no details.  

Specifics:
(0) (10%) Setup. Modeling load and GUI (at the least ability to choose which rendering style)
(1) (10%) Gouraud shading.
(2) (30%) Jittered lines.
(3) (50%) Stroked lines. 30% for it working correctly for one stroke and 20% for the second stroke style.
(4) Extra Credit (up to 10%)
   a. (5%) add an additional sketch style (a 3\textsuperscript{rd} stroke style does not count)
   b. (5%) omit lines interior to the silhouette

Grading:
Your program will be tested against the aforementioned functionality and your code will be inspected – PLEASE DO NOT COPY CODE FROM ANY SOURCE!

NOTE: you must turn-in a precompiled executable of your program!

If you implement the extra credit, please ensure instructions are given on how to use it --- put such in the GUI or have clear instructions printout – do not assume we will read your code and decipher how to use your extra credit.