Diego Gutierrez
CAP5726
11/16/20

Introduction to computer graphics

Final Project Proposal for Simplification (1.2.3)

The Input:

For the input, I will use the mesh files that were given to us for the previous two assignments. I will use OpenGL to take the information from the mesh files and convert it into a 3d model. I will use the mesh loader to calculate the mesh files. I will start the project by using my assignment 2 as the starter code and modify it to what is needed.

The Output:

Once I obtain the input, I will follow the algorithm and obtain the same results shown in figure 9 and 10. Then, without restarting the program to support the change of arbitrary number of target triangle element k as long as k is smaller than the input and export the implication result to files in a obj format.

Specific steps of the algorithm:

First, I will compute the Q matrices for all the initial vertices. Then, select all pairs and computes the optimal contraction target V for each valid pair (v_1,v_2). The error $v^{-T}{}_{(}Q_1, Q_2)V$ of this target vertex becomes the cost of contracting that pair. After, I will place all the pairs in a heap keyed on cost with the minimum cost pair at the top. Afterwards, iteratively remove the pair(v_1,v_2) of least cost from the heap, contract this pair, and update the cost of all valid pairs involving v_1. Then, compute the initial matrices from which the error metric is constructed. After, I will derive the error quadratics and then do the geometric interpretation.