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Simplification and Subdivision

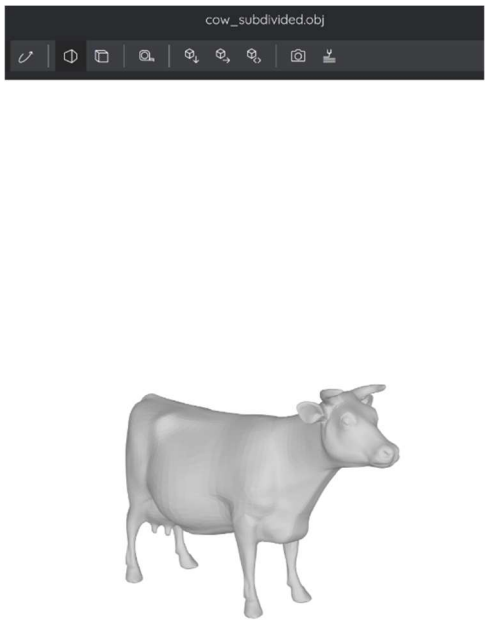
The purpose of this assignment was to implement simplification and subdivision algorithms to simplify a 3D model, and to also subdivide the model to increase definition.

In the common.cpp file I added to the void Face:updatedFace() function. I calculated the face normal using the cross product of two edges, computed the d parameter for the plane equation, then generated the quadratic matrix using the plane equation coefficients. I also adjusted the computeQuadricMatrix function to construct a symmetric quadric matrix based on the plane equation coefficients.

In the simplify.cpp file, I updated the voidupdateCost function to set the new vertex position as the midpoint. Vnew=(v1+v2)/2 Then I computed the quadric error cost from the quadrics of v1 and v2. However, I could not get the program to correctly output a simplify obj file.

In the subdivide.cpp file, I updated the computeNewEdgePoints function to calculate new edge points for loop subdivision using Warren's method from the homework problem description which is too long to type out here (my fingers hurt from coding). The updateOldVertices function was made to update the position of the original vertices using the provided Warren's method. buildNewFaces constructed new faces by dividing each original face into four, then used edge points and original vertices to create new faces maintaining consistent vertex ordering.

Results: In the end, despite my efforts I could not get the program to properly output the simplify algorithm files. I ran out of time to debug it, but the subdivision output files worked flawlessly. I am now ready to submit my application for lead coder for EA video games.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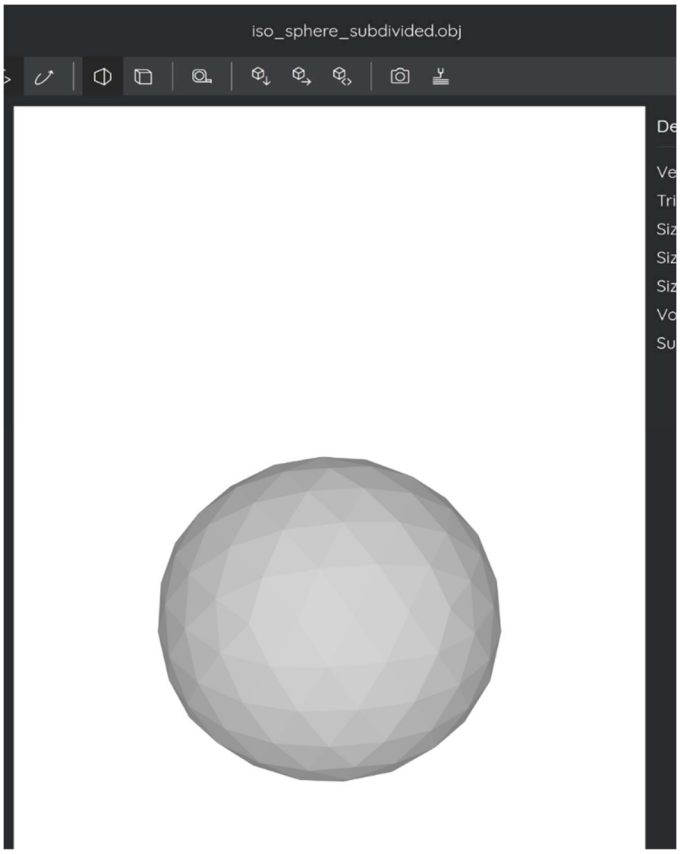
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