CS 550000 Computer Graphics
Homework1 Draw Some Geometry Models
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PROJECT ABSTRACT

I use Visual Studio 2015 to work on my homework one, and add a third-party library 'dirent.h' to my project which provide directory files listing and other UNIX-like operations in Windows.

WORKS

I first go through all of the vertices in model, and find the highest and lowest value in three dimensions. Now we have two maintained value `max` and `min` in each dimension, and here are my instructions to normalize.

- Center the model: Offset each vertex' coordinates by $-(max_d + min_d)/2$ in dimension *d*.

  e.g.

  A point *P (x, y, z)* and its new position is

  $P'\ (x - (max_x + min_x) / 2,\ y - (max_y + min_y) / 2,\ z - (max_z + min_z) / 2)$

- Scale the model: Divide each vertex' coordinates by $(max_d - min_d)/2$ in dimension *d*.

  e.g.

  A point *P (x, y, z)* and its new position is

  $P'\ (x / (max_x - min_x) * 2,\ y / (max_y - min_y) * 2,\ z / (max_z - min_z) * 2)$

And after normalizing the model, we have all the points in region [-1, 1] in three dimensions. Finally, modify the function *onDisplay()* to display the model object by iterating triangles in model and draw one after another at each iteration.
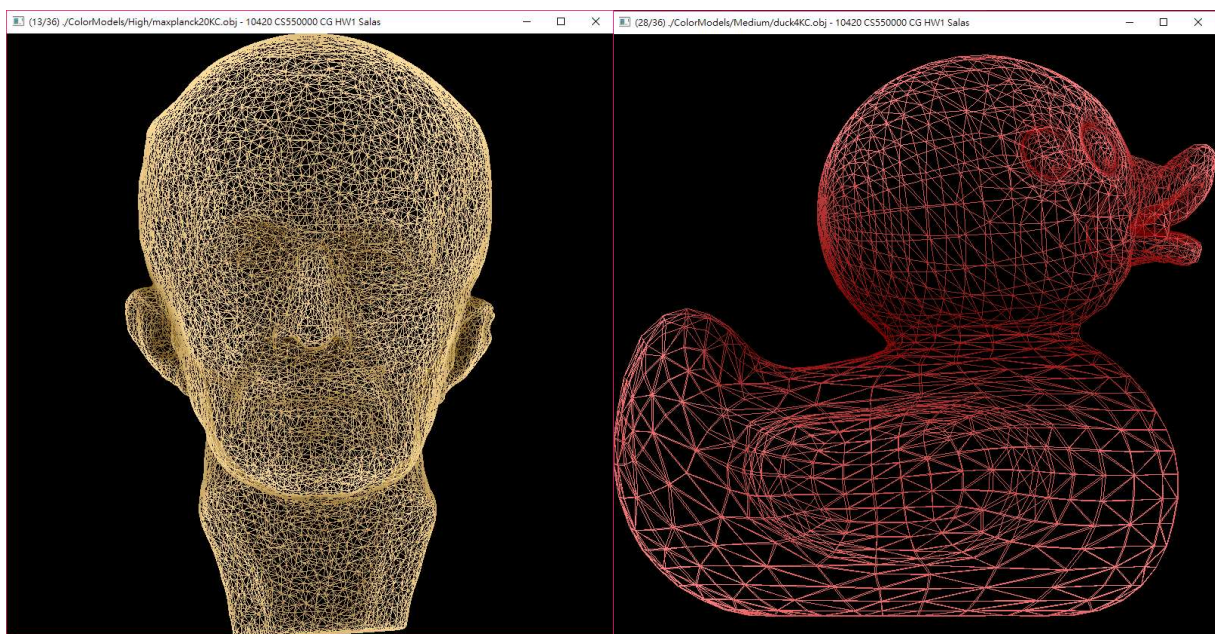
DIFFICULTIES

The *glm* lib is very strange. The indexing system in library seems not uniform. The vertices are indexing from 1 to N; while the triangles are from 0 to N-1. So, my biggest problem is that accessing wrong data from vertices[0] may cause program reach unexpected state or display abnormally.

EFFORTS

Make the program can dynamically load all of files in the folder and its subfolder.

The display window will show the index (current_index / total files) and also show the filename.

SNAPSHOTS