14350 Computer Graphics	Assignment 2 - 02/11/2024

Loading, Moving and Rendering Star Wars' Object Meshes in $\mathbb{R}^3$

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The goal of this assignment is loading, moving and rendering Star Wars' Object Meshes in $\mathbb{R}^3$ using modern OpenGL. These meshes (format .OBJ files) constitute the input data for the graphics program. They concern a ship and a hangar from Star Wars. After loading each OBJ mesh into RAM, you must be able to move a Star Wars' ship between two hangars.

Student's Submission Deadline: November 17, 2024, 23:59; tolerance: 1 week

1 Reference libraries for loading meshes encoded as .obj Files

A similar example for loading .obj meshes is described at: `http://www.opengl-tutorial.org/beginners-tutorials/tutorial-7-model-loading/`. More examples are the following: (a) rapidoobj: `https://github.com/guybrush77/rapidobj`; e (b) assimp: `https://github.com/assimp/assimp`.

2 Who does what?

Every single student must collect one hangar and two fighters' meshes (concerning Star Wars) from `www.cgtrader.com` to start working on this assignment, as indicated below.

3 How to do?

We suggest to retrieve the following assets (hangar and two fighters) from `www.cgtrader.com`:

1. Star Wars Destroyer Hangar:
   `https://www.cgtrader.com/free-3d-models/space/spaceship/star-wars-destroyer-hangar`

2. t-65 fighter:
   `https://www.cgtrader.com/free-3d-models/space/spaceship/star-wars-t-65`

3. Ball fighter:
   `https://www.cgtrader.com/items/1985975/download-page`

4. Millennium Falcon fighter:
   `https://www.cgtrader.com/items/2210358/download-page`

All these assets are encodes as .obj files. That is, the geometry of each assets is encoded according to the .obj. format. So, we need an .obj loader for reading each asset in memory. Such a loader is a C++ function (designed by you or anybody else) that is called from your graphics application/program. Afterwards, construct a scene in the space with two hangars, parking a single fighter in each hangar. Then, move a fighter from one hangar to another. This scene is the base for the final project of the course unit in Computer Graphics.

References

[1] OBJ format wiki: `https://en.wikipedia.org/wiki/Wavefront_.obj_file`

[2] More notes about OBJ format: `https://www.marxentlabs.com/obj-files/`

[3] The OpenGL Shading Language `https://www.opengl.org/registry/doc/GLSLangSpec.4.40.pdf`, last access on 08/04/2015.

[4] Dave Shreiner, Graham Sellers, John Kessenich, and Bill Licea-Kane. OpenGL Programming Guide, 8th edition, version 4.3. Addison-Wesley, Upper Saddle River, 2013.