3D Project Part 2

Overview

In this project, you will develop a basic 3D application that will showcase several features of 3D Graphics using OpenGL. You are required to use the accompanied project as the code base for this project. Please do not use any other codebase.

Grading

Part 1 [100 points]
Rovers are moving on Mars Surface with collusion. Mars must be modelled as a sphere.

- Texture Mapping with Shading blending. *30 points*
- Independent Camera Control with Mouse and Keyboard. *20 points*
- One Rover Control with Mouse and Keyboard (A Rover has 4 rotating wheels). *30 points*
- Two Rovers trying to catch and collide with the user-controlled Rover, if there is a collision the user-controlled Rover stops. Use the AABB for collision detection. *20 points*

Part 2: [Unlimited points ☺]
Planet surface with height maps (only a small part of Mars with height map, not the whole planet)

Sumengen, Selcuk, and Selim Balcisoy. "Real-time simulation of autonomous vehicles on planet-sized continuous LOD terrains." (2005).

What to Submit

You should submit an executable and a report. The report should have a screenshot of each feature followed by an explanation of how you have achieved it.
Note: Change the window title with your name.

References

Overall information about Mars https://mars.nasa.gov/

https://trek.nasa.gov/mars/ (Select 3D Globe from the lower left menu)

Texture you can use for the part 1: http://planetpixelemporium.com/download/download.php?mars_1k_color.jpg

Overall good info on Mars Data http://planetpixelemporium.com/mars.html

Height map

https://planetary.s3.amazonaws.com/assets/images/4-mars/2008/mola_mercat.jpg

ftp://pdsimage2.wr.usgs.gov/pub/pigpen/mars/mola/contours_shapefiles/

https://hi.stamen.com/how-to-make-3d-maps-of-mars-25e22914d340

Detailed Texture map of Mars Surface https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA02820

Paper: https://dspace5.zcu.cz/bitstream/11025/912/1/Sumengen.pdf