TDT 4195 - Lab Assignment 3

Kari Lovise Ness (MTING)
Håvard Kjellmo Arnestad (MTFYMA)

September 2019

1 Task 1: More polygons than you can shake a stick at

a)

Not requested.

b)

Not requested.

c)

Figure 1 shows one crater found in the lunar terrain with the normals as the rgb coordinates.

d)

Figure 2 shows the moon landscape after applying light.

2 Task 2: Helicopter Parenting

a)

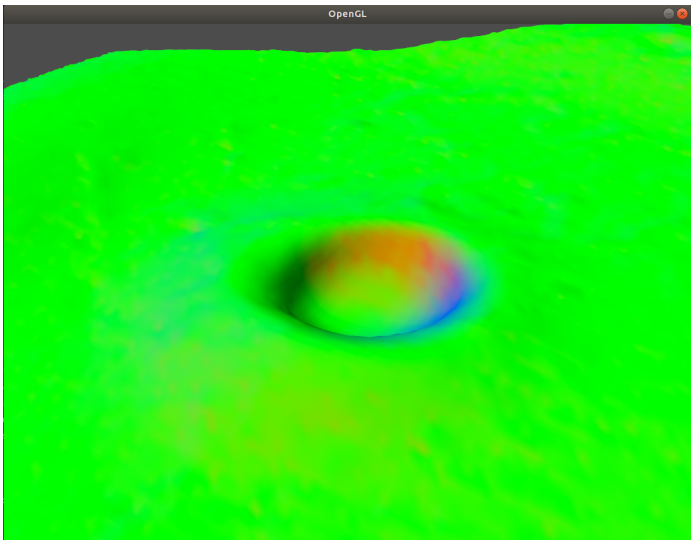
Not requested.

b)

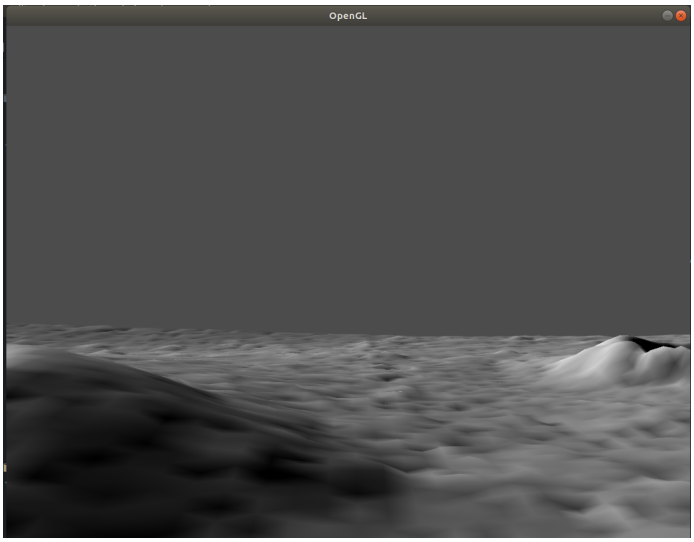
Not requested.

c)

The helicopter being drawn can be seen in figure 3.



Figur 1: The crater found in the lunar terrain.

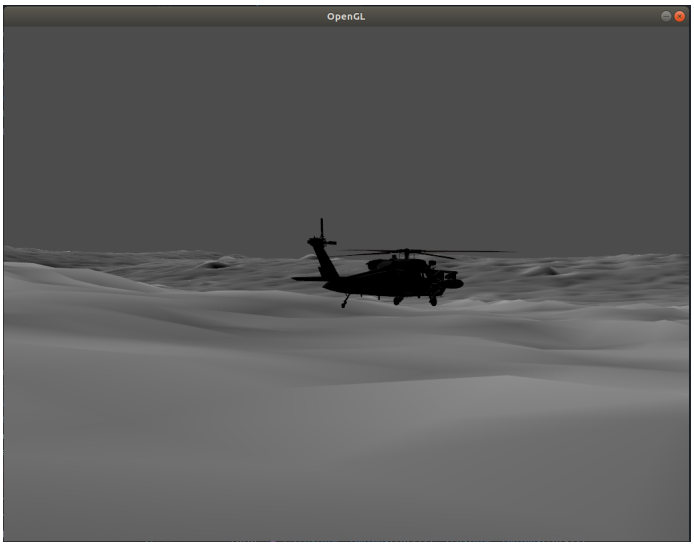


Figur 2: The moon landscape.

3 Task 5: Help! My lighting is wrong!

a)

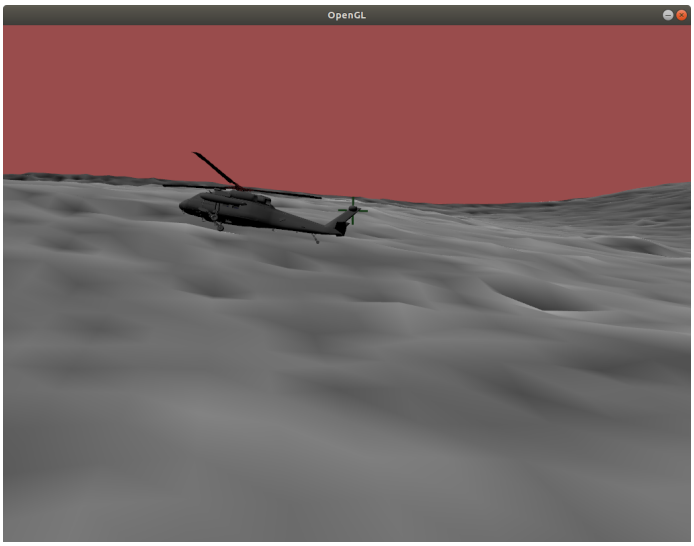
Figure 4 shows the dark side of the helicopter, while figure 5 shows the bright side of the helicopter. Both screenshots have been taken in the same camera



Figur 3: The helicopter

position.

Figur 4: The dark side.

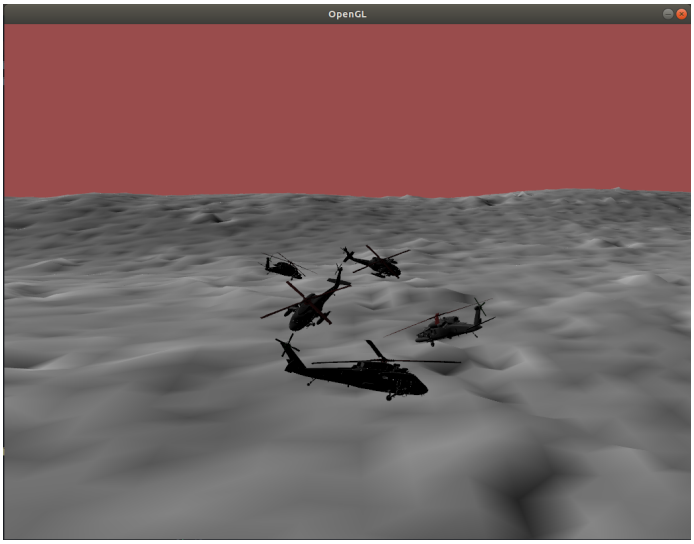


Figur 5: The bright side.

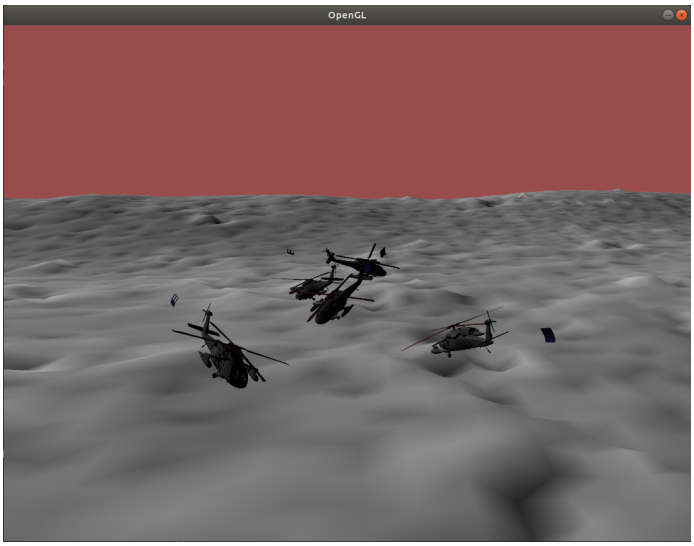
4 Task 6: Time to turn this thing up to 5

a)

In figure 6 one can see 5 helicopters flying around in the moon landscape.



Figur 6: 5 helicopters.



Figur 7: Open doors on the helicopters.

5 Task 7: Optional Challenges

d)

Figure 7 shows the five helicopters with open doors with the letter "o".

Helicopter simulator

We have chosen to combine some of the optional challenges, in a fun (and hopefully impressive enough) way. A helicopter has taken the place of the camera, so you can fly it around the moon with fairly realistic physics; inertia and air resistance. The helicopter will tilt in a reasonably realistic way. The controls are `A` and `D` to rotate the helicopter around its own axis. `W` and `S` to tilt the camera up and down. `SPACE` to go up in height and `LEFT Ctrl` to go down. The arrow keys are used to accelerate in the forward/backwards and sideways directions. The (letter) `o`-button slides up the door.

A little bonus: When the velocity increases the field of view will expand to give a feeling of speed. I also want to point out that the helicopter rotates around its own rotor axis, as it should. To achieve that another translation matrix has been inserted before the camera projection.