COSC363 Assignment 1

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# Description

The scene depicts an alien spaceship landed on earth at night and under attack. There are 6 missile turrets are surrounding the spaceship and constantly firing at it. There are 5 aliens in the scene, 1 piloting the spaceship and 4 running away. There is a spotlight on a nearby tower highlighting the aliens running away.

# Extra Features

* Planar shadows casted by the 6 turrets
* A spotlight that rotates to follow the aliens
* A skydome
* Physics models, missiles target spaceship and follow it if it moves
* Spaceship liftoff
* Particle system, when missiles explode, explosion particles are created

# Equations

The equation for when the spaceship has taken off and flies away is shown in equation 1 and 2.

Equation 1

equation 2

The equations to get the turrets and missiles to look towards a location is shown in equations 1, 2 and 3. Eye is a matrix that is where the object is positioned. Look is a matrix that is the position of where to look at. RotationZ and RotationY are the respective rotations in degrees.

# Controls

* Up arrow moves the camera forward by 0.1 units.
* Down arrow moves the camera backward by 0.1 units.
* Left arrow turns the camera to the left by 0.1 radians.
* Right arrow turns the camera to the right by 0.1 radians.
* W moves the camera up in the air by 0.1 units.
* S moves the camera down by 0.1 units.
* Space makes the spaceship take off.

# Build Instructions

This was developed in vscode on linux with the CMake extension. To build, use CMake with the provided CMakeLists.txt.

# References

<https://polyhaven.com/a/kloppenheim_02>

# Declaration

I declare that this assignment submission represents my own work (except for

allowed material provided in the course), and that ideas or extracts from other

sources are properly acknowledged in the report. I have not allowed anyone to

copy my work with the intention of passing it off as their own work.

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