

# Scenegraph Project

CS4300 - Computer Graphics

***Done by***

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## Scene Overview

The scenery includes a grass ground, a water body, two buildings, a light house, a shining moon, a humanoid and a camera drone.

The humanoid is raising his arm, to welcome us to visit his town.

The first building has a rectangular shape with five stories. Each story has either a wooden window, or a see-through window. The second building has a prism-like shape with three stories. Each story has either a glass window or a see-through window.

The camera drone can be controlled and move around the scene, with rotating blades on top of each propeller to have the realistic view of the drone flying. The drone further has a red cylindrical camera and a stand to hold the light.

The light house has a roof and a bricked body, with a yellow spot light rotating around 360 degrees.

The screen can be seen in the perspective of world view or camera view. The world view is the perspective view from a stationary point above the ground to see every object in the scene. The camera view is the perspective view from the camera of the flying drone.

Configure the file path to be **src/main/resources/configs/lighthouse.txt** to see the main scene.

Program may take up to 20s to load due to large texture files.

## User Manual

The program starts with the current view to be world view. Press “Space” bar to toggle between camera view and world view.

Additionally, the camera drone can be controlled to move around and get exclusive view. The camera control is as follow:

1. The camera should move up without turning using the “up” arrow key.
2. The camera should move down without turning using the “down” arrow key.
3. The camera should move left without turning using the “left” arrow key.
4. The camera should move right without turning using the “right” arrow key.
5. The camera should turn left in its place using the “a” or “A” key.
6. The camera should turn right in its place using the “d” or “D” key.
7. The camera should turn up in its place using the “w” or “W” key.
8. The camera should turn down in its place using the “s” or “S” key.
9. The camera should tilt right in its place using the “f” or “F” key.
10. The camera should tilt left in its place using the “c” or “C” key.
11. The camera lens can zoom in and out with the + and – keys.

## Scene Lighting

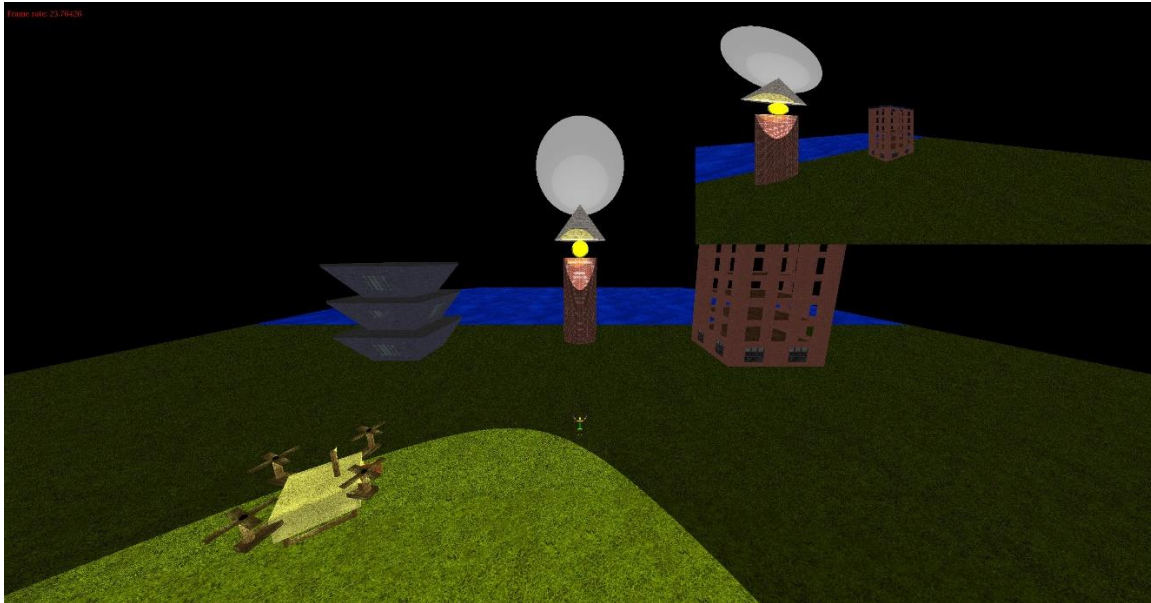
There are two stationary lights and one animated light. The animated light is on the light house rotating 360 degrees around the scene. The second light is on the moon shining on the ground, and the third light is near the ground shining up part of the light house and the moon. The yellow spot light from the light house is clearly visible.

## Scene Texture

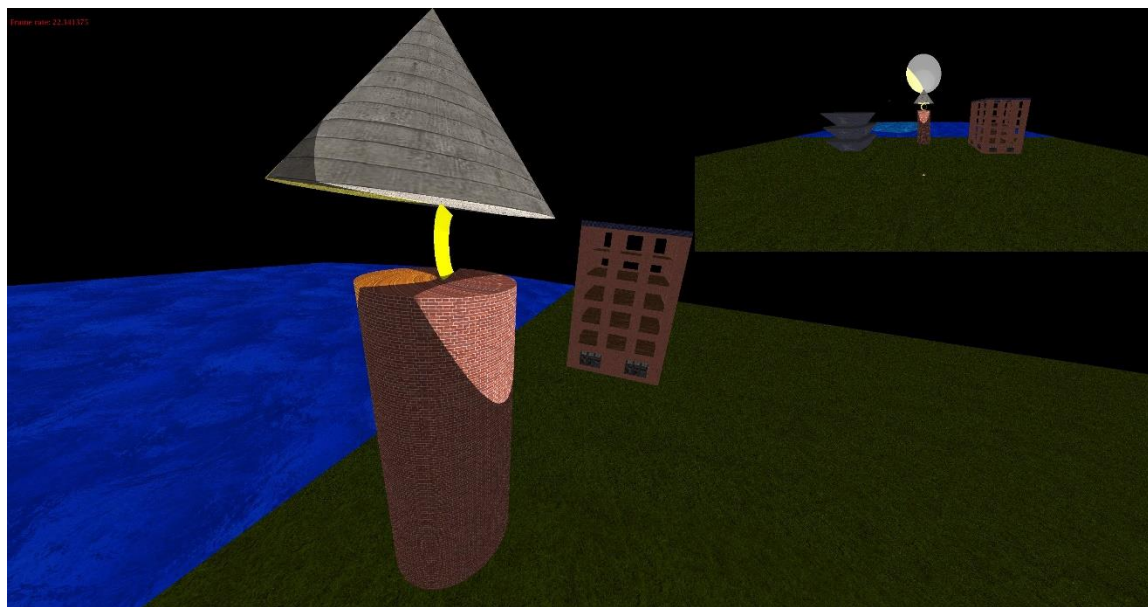
The models have textures to increase the realistic feel.

1. The ground has texture of grass (credit: <https://elements.envato.com/small-grass-leaves-green-texture-PJZ5YV8>)
2. Rectangular building wall has texture of painted cemented brick (credit: <https://www.pinterest.com/pin/213076626096805645/>)
3. Recessed window on rectangular building has texture of wooden window (credit: <https://www.pinterest.com/pin/483222234998859687/>)
4. Rectangular building floor has texture of wooden floor (credit: <https://www.shutterstock.com/search/wood+floor+texture>)
5. Rectangular building roof has texture of striped roof (credit: [https://carpetdepotsnellville.com/carpet-depot/carpet-612818\\_1920/](https://carpetdepotsnellville.com/carpet-depot/carpet-612818_1920/))
6. Prism-like building wall and floor has texture of metal (credit: [http://seamless-pixels.blogspot.com/2012/09/free-seamless-metal-textures\\_28.html](http://seamless-pixels.blogspot.com/2012/09/free-seamless-metal-textures_28.html))
7. Recessed window on prism-like building has texture of glass window (credit: <https://www.textures.com/download/highrise-glass0055/66262>)
8. Drone body has texture of scratched metal (credit: [http://seamless-pixels.blogspot.com/2012/09/free-seamless-metal-textures\\_28.html](http://seamless-pixels.blogspot.com/2012/09/free-seamless-metal-textures_28.html))
9. Drone propellers, blades, camera, and other miscellaneous parts have texture of painted metal (credit: <https://www.cgtrader.com/3d-models/textures/architectural-textures/pbr-seamless-sci-fi-texture-pack-part-2>)
10. The light house wall has texture of brick (credit: <https://www.swtexture.com/2013/04/brick-english-pattern.html>)
11. The light house roof has texture of tiled roof (credit: <https://www.textures.com/category/roofing/108>)

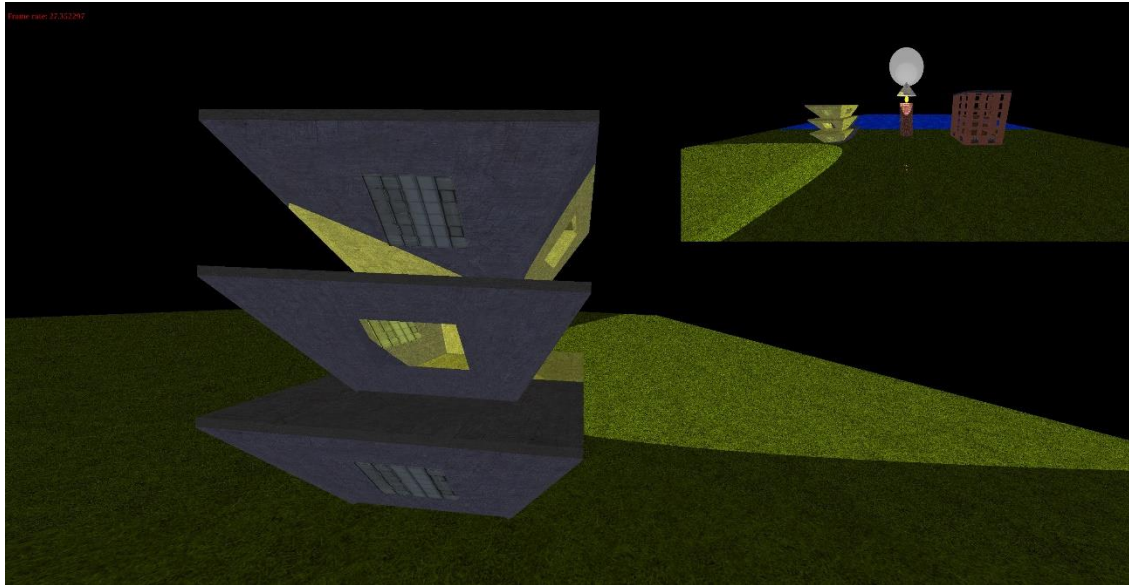
## Snapshots of the Scene



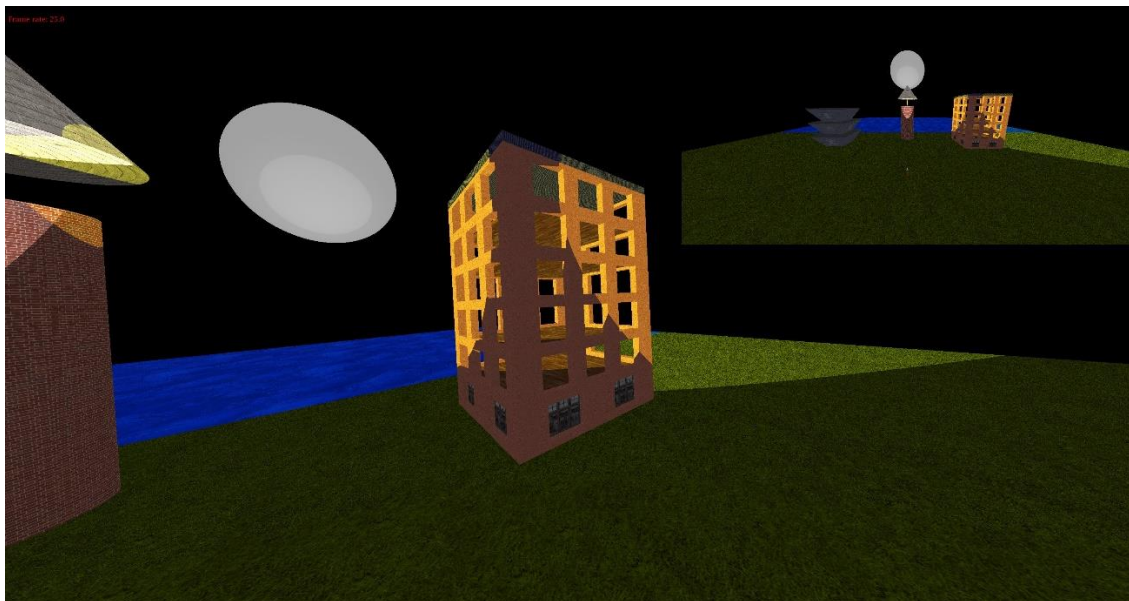
*Figure 1 World View including Drone, Human, 2 Buildings, Light House and Moon*



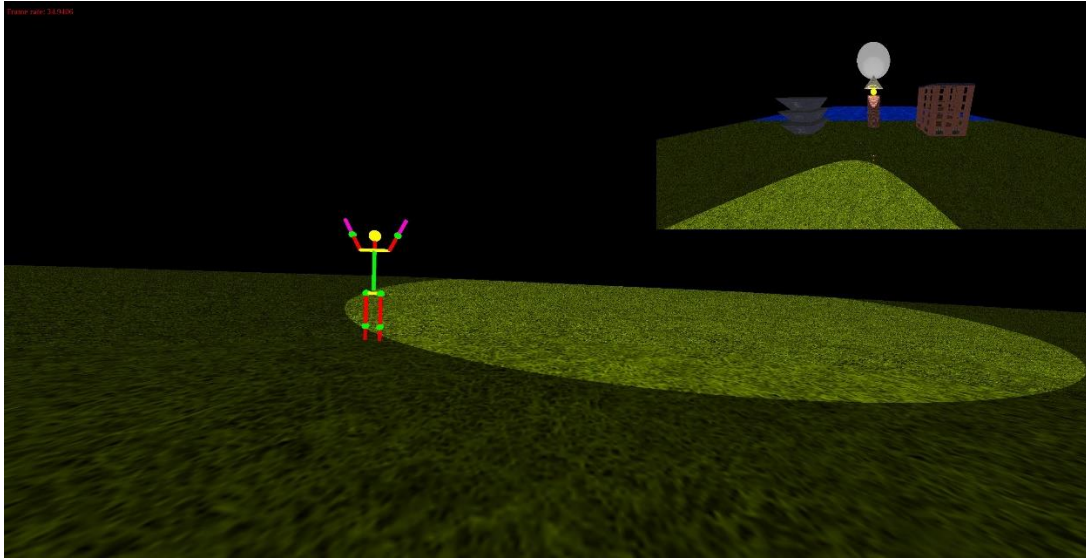
*Figure 2 - Drone Camera View and Close Up at Light House*



*Figure 3- Close Up at Prism-like Building*



*Figure 4 - Close Up at Rectangular Building*



*Figure 5 - Close Up at Humanoid*