

**CPT205-Computer Graphics**

# **The Road to Mediocre Life**

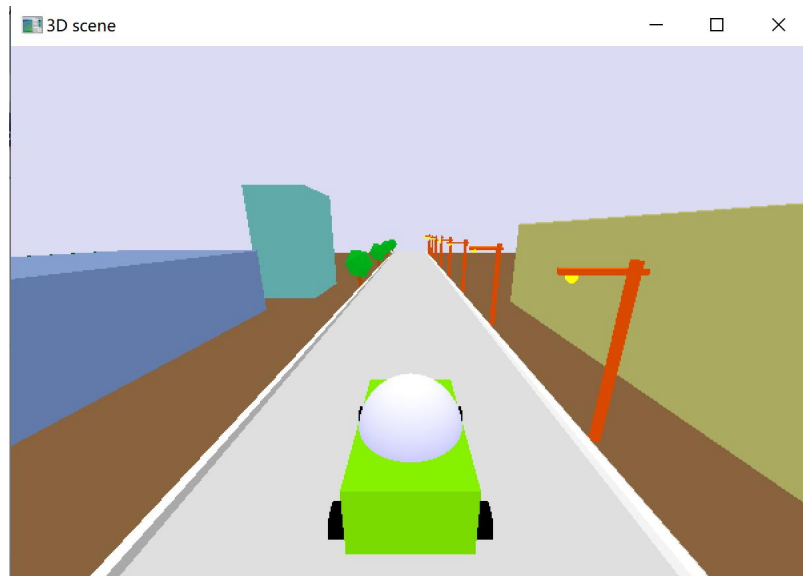
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**Programme: Information and Computing Science**

## 1. Brief introduction

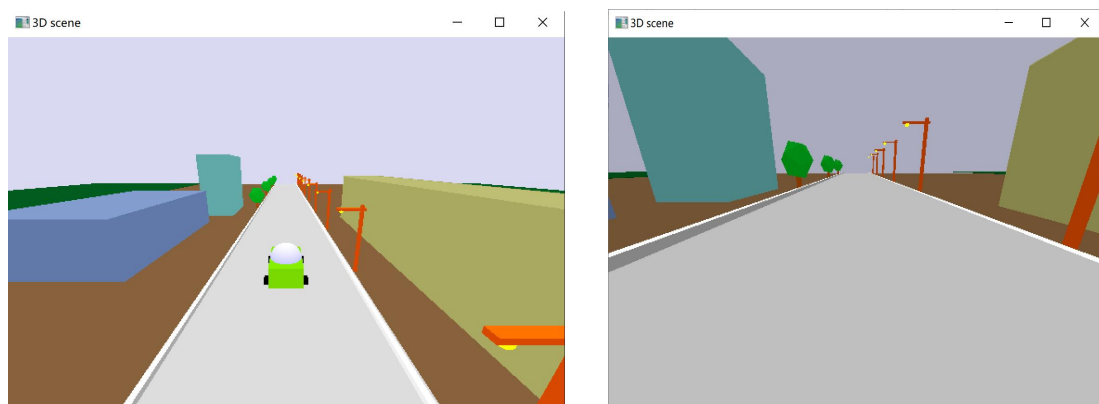
The purpose of this project is to design a 3D dynamic scene of a car moving on the road. In addition to the road and car design, the scene also contains many buildings, trees, street lights and lawns. This increases the complexity and authenticity of the scene. The project also added material light effects to every objects and texture maps to the background to show the environment and lighting effects at different times. The cab of the car has a different specular coefficient so it looks more like glass. The initial scene is as follows:



## 2. Instructions

### 2.1 Mouse and keyboard interaction

When the project is running, clicking the left mouse button leads to the car moving forward at a constant speed. If you press the space bar, the car will stop moving. In addition, the "w" button makes the scene zoom out and the "s" button makes it zoom in.



## 2.2 Animation of ambient brightness

A parallel light source is set in the scene, which causes the ambient light factor to drop to 0 and then back up to 0.7 with each window refresh. This effectively creates a transition from day to night and back again. The figure below shows the dimming effect:

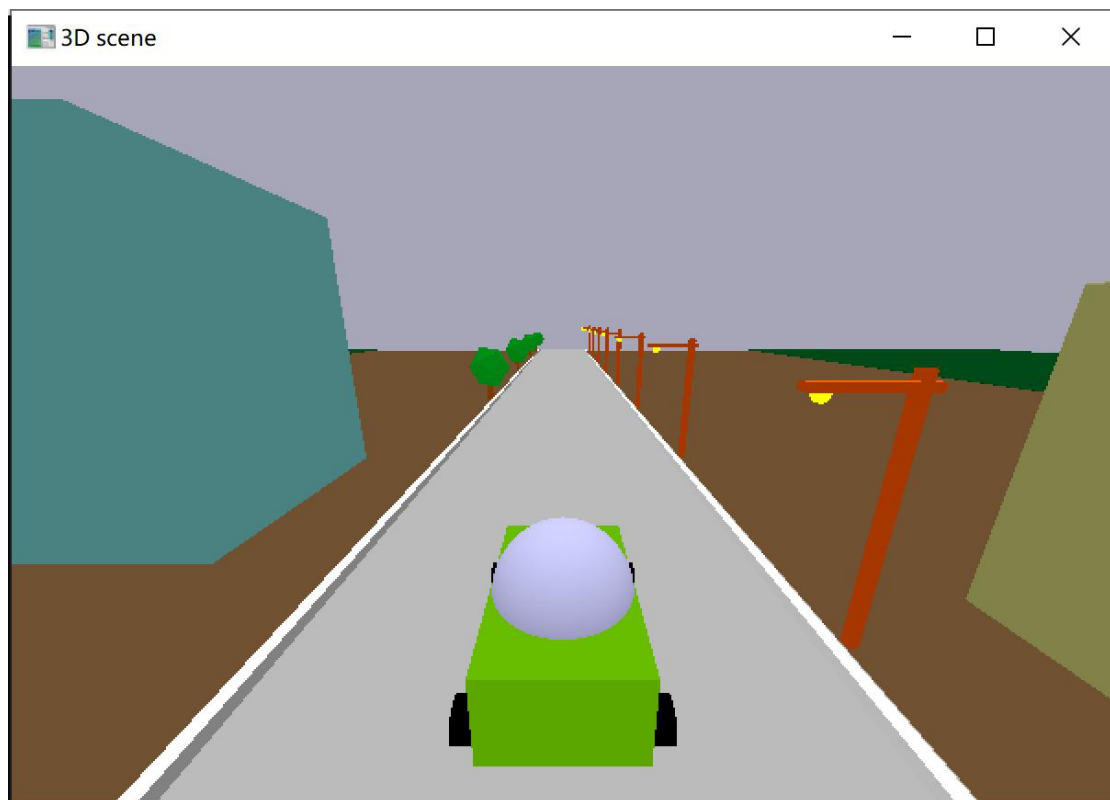
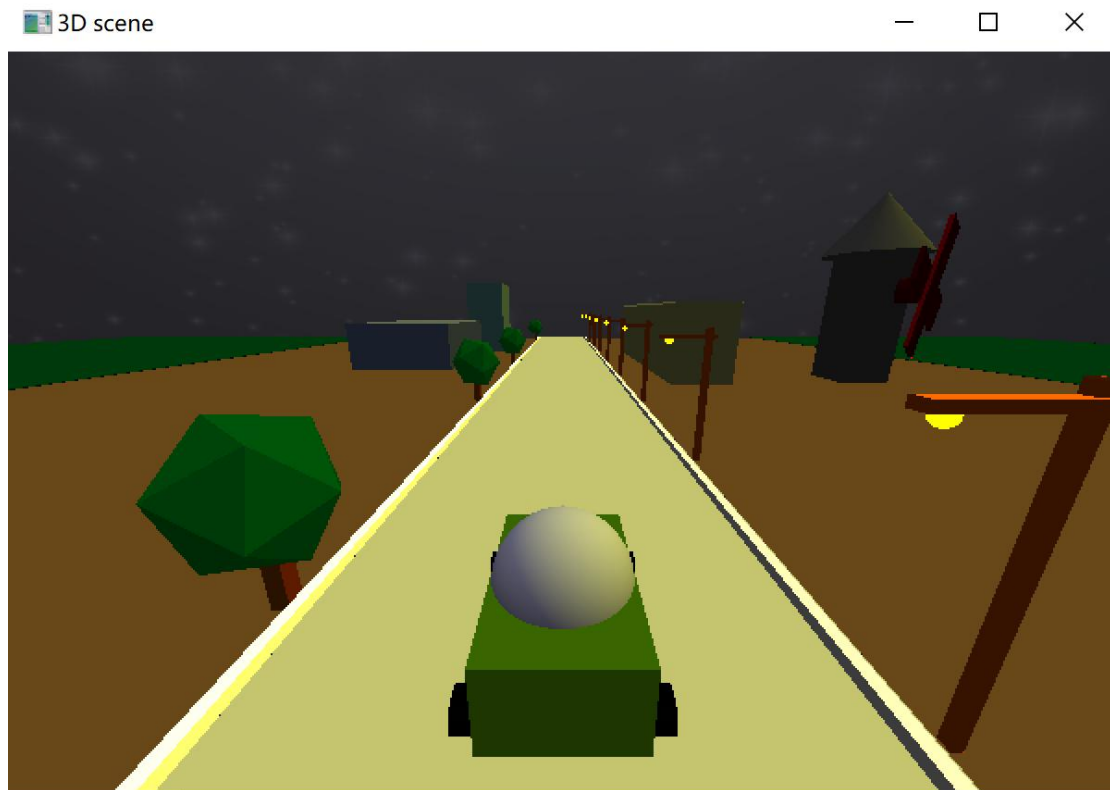


## 2.3 Lighting and background changes

When the ambient light gets dimmer, the street lights will turn on automatically. Yellow point lights will illuminate the entire pavement. At the same time, the background will be textured with starry sky, giving the effect of stars shining at night.



As the night deepens, the stars will fade for a while. Then the ambient light will gradually change again and the street lights will automatically turn off. Eventually, the scene will return to its original dawn state.



## 2.4 Windmill

A self-rotating windmill is added to the scene, which uses the same hierarchical modeling method as street lamps and trees.

