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CEN 4.1S

Graphic Processing Systems final project documentation

1) Overview

I developed the project in C# windows forms, and used essential libraries like OpenGL, ShadowEngine, glut using Visual Studio IDE.

2) Project structure

The project contains 3 main classes and also in the folder **Objects** the other classes where the 3D models' objects are loaded and drawn at specific coordinates.

Camera.cs -> here is present the camera movement logic and also the initial spawning point of the character is in the center of the map.

Skybox.cs -> here is drawn the skybox that is represented by a cube, that inside it will hold the scene. The skybox is rendering 4 texture images: front, back, left, right that will be placed together to make the cube. Also, in this texture can be seen some mountains at the horizon according to the requirements. And a sun that is a source of light for the scene. Also, the grass texture is made in this class to complete the environment.

MainClass.cs -> here all the objects are instantiated and drawn at the specified coordinates. I used for loops in order to create more houses and tree objects at once.

3) 3D Models

A model is loaded by calling the following method:

```
ContentManager.GetModelByName("House type 2.3ds");
```

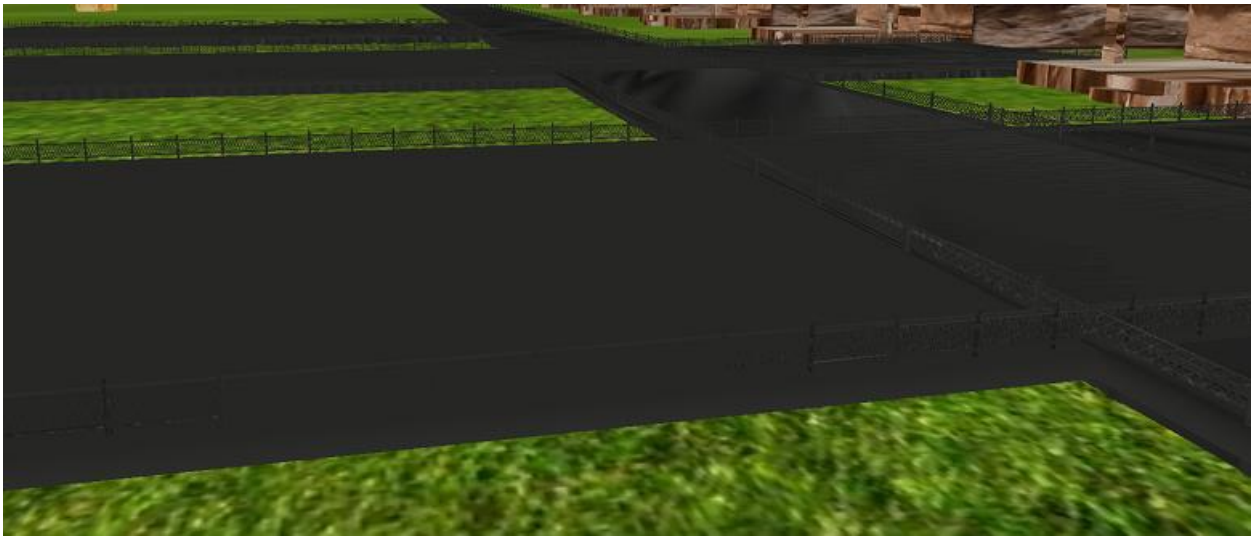
Where the file is a 3d blank object that needs to be applied some textures, that are represented as meshes taken from **textures** folder by a specific name.

- House type 1:

- House type 2:

-House type 3:

- Road:



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- Tree type 1:

- Tree Type 2:

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- Street Lamp:

- Statue:

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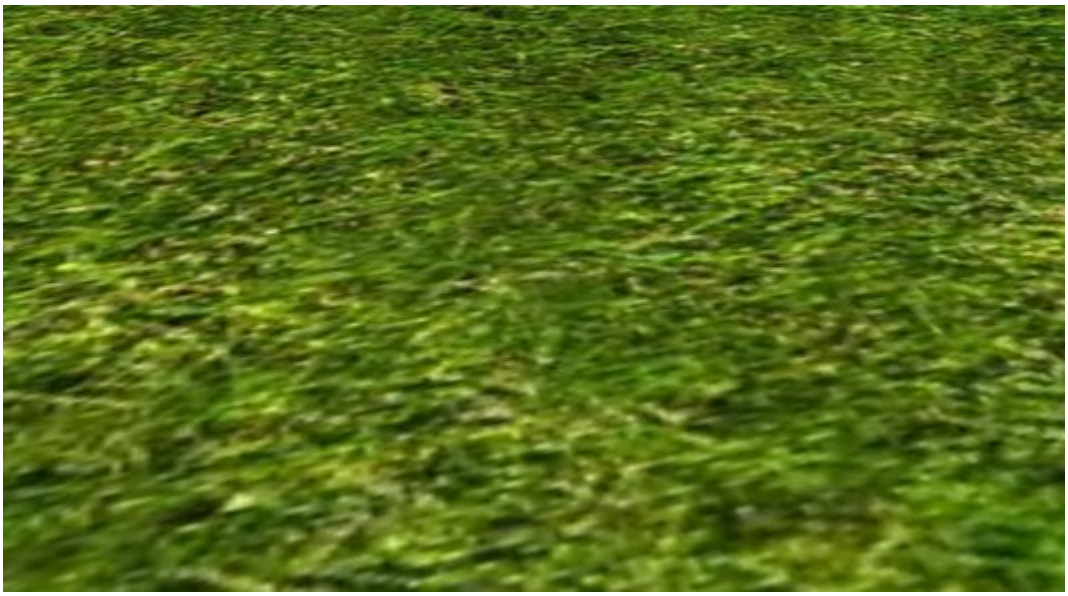
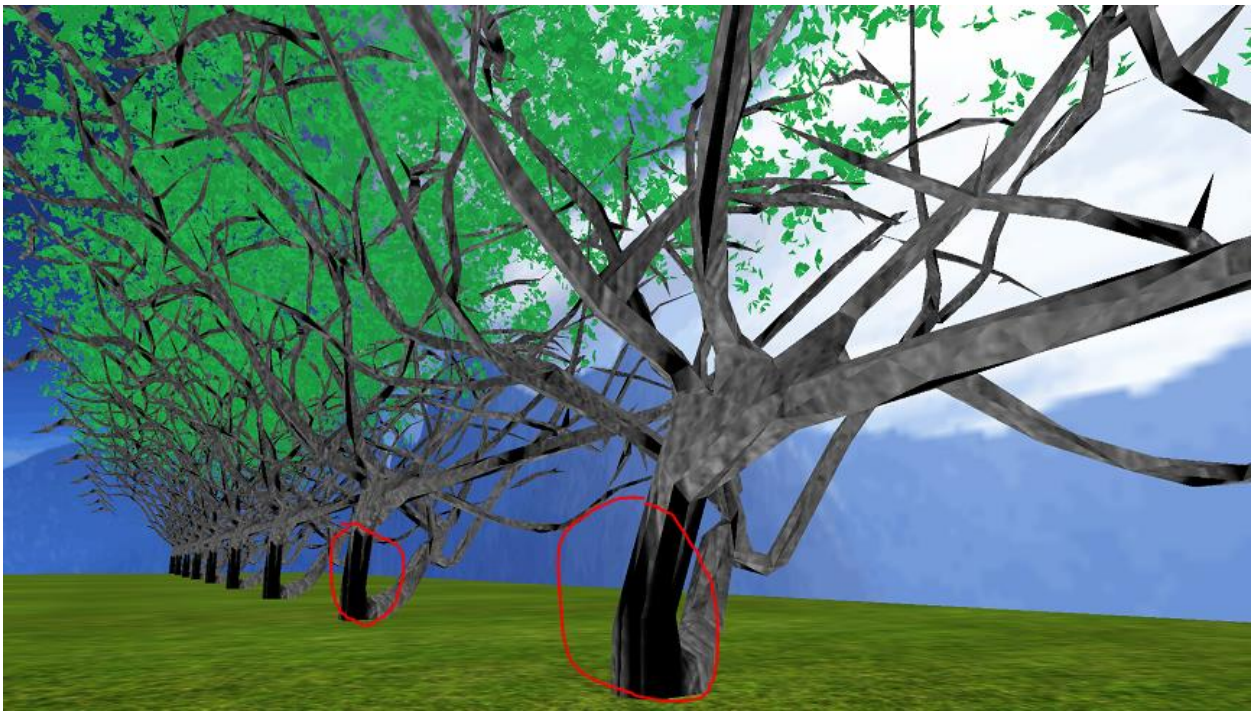
- Grass texture:

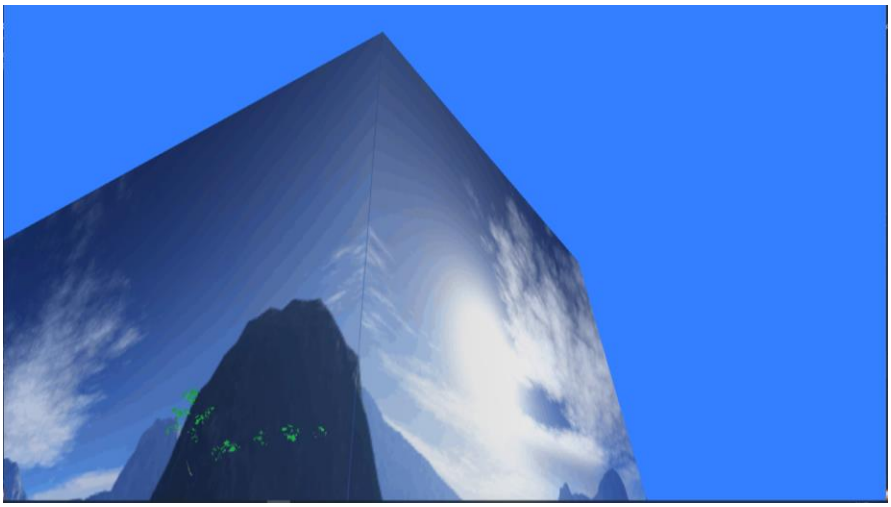


- Light source in the skybox:

That is causing shadows:



- The skybox with the mountains and the cube:



4) Camera control

The camera is set to a first-person perspective and can be rotated 360 using the mouse.

In order to move through the scene with the camera you should press the "**W**" key or to keep pressed the **mouse left button** in order to advance in the direction pointed by the mouse.

5) Opening the project

- The executable: can be found in the folder **exec** and the file **GPS.exe** should be opened.

!!! You can wait up to 20 seconds until the app will start, because it will need to load up all the models and textures in the scene.

- The project source file: can be found in the **src** folder, and with Visual Studio 2019 should be opened the **GPS.sln** file.

*** I could have rendered more models in the scene, you can actually check the **model** folder and there are other house and tree models that are waiting to be loaded in the project, but as more objects in the scene, the more lag it brings to the environment.

So, I wanted to be as smooth as possible with a clean, but on point layout.