

Mystery Island

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1. Subject specification:

This subject of the project was to design a relaxing, yet mysteriously looking island as an interactive app in which the user can freely explore the scene and admire its low-poly beauty.

2. Scenario

Scene and objects description

The scene contains: a small island, on it:

- a little house
 - a Moai statue like the ones on Eastern Island.
- water, on it:
 - a ferry boat

The scene is surrounded with a skybox texture, which contains the sky and some mountains in the background.

Functionalities

The user can look around the island, and interact with some objects on it. The user can push down and pull back the Maori statue after it was found, and can create a sunrise/sunset whenever he/she wants. The ferry can be moved forward and backward. The whole purpose of this application is to provide a picturesque scenery, with a few movable, interactive elements.

3.Implementation

Classes:

- Camera
- Mesh
- Model3D
- SkyBox
- Shader

The camera class is responsible to initialize the camera, and move it when needed.

The 3D models are loaded in Model3D objects. The Model3D class is responsible to load (using the Tiny Object Loader header-only library) and store 3D models. A 3D model is a set of meshes (which are controlled by the Mesh class).

The SkyBox class loads the six separate textures of the sky box and transmits them to the shader programs.

With the Shader class, we can easily initialize the shader programs.

4. User interface presentation / Guide

The camera can be moved with the WASD buttons.

It can be rotated to left and right, with Q and E respectively.

The small Moai statue can be animated like it was being pushed back by holding the J button, and pulled back up by holding the K button.

The ferry boat can be moved forward with the key F, and backward with the key R.

A sunset can be simulated by holding the P button, and we can make the sun rise back up with the key O.

One can change between solid and wireframe representation using the key M.

5. Conclusions/further developments

The program could be further developed by adding some more objects the user can interact with. For more beauty, a great development would be to add shadows. The scenery could become more dynamic with rain or snow effects, an active volcano, or other moving things.

6. References

- 3D models: free3d.com
- Moodle, GPS Laboratory Works and Courses
- www.stackoverflow.com
- <https://www.opengl.org/documentation><https://www.opengl.org/documentation>

