Computer Graphics Project

Recreating Nether Earth

Team 2

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# Introduction

The purpose of this document is to provide the reader with an in-depth understanding of our version of Nether Earth. There are two main sections in this guide. The first section, Project Design, will discuss the overall class structure and the logic behind each of our classes. The second section, User Manual, will accommodate the user by providing keyboard commands.

# Project Design

See Appendix for Class Diagram.

## Logic

LevelRenderer: Class containing the layout of the level and the logic to draw the different tiles.

**Base:** Class to render the main Base on the map

**Camera:** Abstract class used for camera orientation and movement.

**Robot:** Encapsulates and manipulates robot-related, such as components, coordinates and orientation.

**RobotCamera:** Child class of Camera. Used for Robot View.

**LightCamera**: Creates a new LightCamera and is used to adjust the camera position according to specified light positions on the map

**SpotLight**: Sets the standard spotlight components used for all instances of spotlights on the field

**CirclingCamera:** Bird eye view camera. Can rotate around the seen. A spotlight can also be toggled on and off to where the camera is looking at.

**CommanderCamera:** The strategy game type camera. Player can also zoom in and out and rotate it around the look-at point .

**FreeLookCamera:**  Mouse look camera view.

**Game:** Where game logic is computed.

**Player:** Where information on a player is held.

**PlayerI nput:** Where player-related commands are parsed and executed.

## Model

**Model:** Base class that all models must inherit and define the render() method.

## **Helper**

GeoHelper: Contains various geometric functions used to help with other models. Also contains a function to calculate normals.

**Buildings**

BaseModel: Using the GeoHelper functions, renders the main Base Model components

FactoryModel: Using the GeoHelper functions, renders the Factory components.

## Material

Material: Base class that every material inherits. It controls the reflection, shininess and the diffuse properties.

DefaultMaterial: The default material that is applied to all models none is provided. It is a normal material with no reflection and no shininess.

MetalMaterial: Gives a metallic look by being very shinny.

OrganicMaterial: Applies to object such as grass by giving a higher tint of green.

RockMaterial: Applies to object such as rock and walls by giving a higher tint of brown.

## Player

AntennaModel: Defines the vertices for the small cylindrical object that is on top of the player.

PlayerModel: Defines the vertices for the player model.

## Robot

ElectronicsModel: Model that represents the Electronics component. Created using various ‘glu’ quadrics.

NuclearModel: Model representing Nuclear component. Created using gluCylinder.

## Static

FenceModel: Model for the fence that is around the map.

GrassModel: The model that represents the floor.

MountainModel: Model containing 3 peaks to represent mountains.

**PitModel:** Model representing pit terrain. Contains scaled blocks for foundation and cylinders and disks for smoothing.

TeamNumberModel: Model of our team number. It is often reused on other models.

## Texture

**Imageloader:** Used to convert .bmp files into Image objects.

**TextureManager:** Singleton class called by models to find textures. Uses a map to make textures easily retrievable.

## Helper

AntTweakHelper: Helper class to help setup AntTweak and bind variables from the game.

**DirectoryManipHelper:** Helper class used by TextureManager to retrieve the file names for the texture files.

# User Manual

# Appendix

Exhibit 1: Class Diagrams