

Wonderland – Abgabe 3

In this release of the game we have implemented two levels. The players must complete both levels in order to achieve the aim of the game. The aim of each level is to find the way to get to the next level.

Our characters have some specific features. Otto is strong and can move heavy objects and Kirsten can jump higher.

The screen is split and each player controls one side of the screen. The first player can move the character with the WASD keys, jump with SPACE and interact with the other objects with the key 'V'. On the other hand, the second player can move with the arrow keys, jump with ENTER and interact with the key 'M'.

In this release we have implemented collision detection so that the characters cannot go through the walls anymore. We have also changed some textures and the lighting. The light doesn't follow the camera anymore.

We also have two animated characters using key frame animation.

Special effects:

- Particle system: we use a particle system to represent the dust produced by the destroyed wall in the first level. To implement this special effect, we have followed the following article: <http://nehe.gamedev.net/data/lessons/lesson.asp?lesson=19>. We modified the particles so that they can move upwards with a dust texture and living as long as we need.
- Cartoon Shading: we have implemented cartoon shading following the next article: <http://www.lighthouse3d.com/opengl/gls/index.php?toon>. We have adapted the explanation code in order to use textures instead of colors. In our case, the texture becomes darker when there is less light.
- Octree: we have implemented an octree in order to have a more efficient frustum culling. We have followed the explanations of the following link: http://www.flipcode.com/archives/Frustum_Culling.shtml. In this webpage, frustum culling is done with a quadtree. We have adapted it to obtain our octree.

Special Characteristics:

- Object loader: we have improved the object loader of the last assignment so that we can load the textures of the game in different ways (mipmap, bilinear...) and we have also improved the way we load the objects. Now the game is faster, we don't need to load the texture of the object every time we draw it.
- Camera: The camera has been improved so that it doesn't go through the walls and the objects. It follows always our characters but detects when there is something between the camera and the character (doing raycasting). When something is detected, the camera zooms in the direction of the character.
- The two main characters have been animated using key frame from md2 models.

Libraries:

- GLFW: Window and keys .(<http://glfw.sourceforge.net/>)
- FreeImage: Texture Loader. (<http://freeimage.sourceforge.net/>)
- Physx: Collision Detection and character movement.
(http://www.nvidia.com/object/physx_9.09.0428_whql.html)
- GLEW: For advanced opengl features (shaders). (<http://glew.sourceforge.net/>)

Objects used in the game:

Some of the objects have been modeled with GoogleSketchup and some other objects have been take from the Internet.

Walkthrough

LEVEL 1:

1. Otto must move the oil can near the button which is placed behind the wall of the right side .
2. Kirsten must jump on the oil can and jump again to reach the button.

Now the bar door of the room is open and the characters can go inside.

3. Otto must take the drill lying on the floor of the room and use this drill on a wall between the exit door and the button.

After using the drill, we can see a particle system with the wall destruction. Now there is a new room in the place.

4. Kirsten must go inside the new door with the skeleton and take the key that is inside the skeleton. She must be really close to the key in order to take it.
5. Finally Kirsten uses the key to open the exit door.

LEVEL 2:

1. Kirsten must jump on the platforms placed on the left wall
2. In the upper platform there is a candle. She must take it.
3. Now she must go next to the cannon and use the candle to light the cannon.

Otto jumps inside the little room.

4. Now Otto can open the door so that Kirsten can join him.
5. One of the characters must use the stairs to reach the top of the tower and end the game.

We have not implemented shortcuts to go to the next level because the game is very short. :)

F-KEYS:

F1: Help of the game

F2: Show the framerate on the top-left of the screen.

F3: Enables/Disables Wireframe mode.

F4: Changes textures quality between nearest neighbor and bilinear. The default quality is nearest neighbor.

F5: Changes MipMapping quality between no mipmapping, nearest neighbor and linear (in this order). The default is linear.

F6: We have not used this key.

F7: Enables/Disables the use of Display Lists. The default is using display lists.

F8: Enables/Disables frustum culling. The default is using frustum culling.

ATTENTION!: The changes between the different texture and mipmaps qualities are only visible if display lists are disabled.