Documentation for submission 2

Spell 4 the Bell

a game, almost complete, by
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Game status:

Implementation

- Handcrafted environment models
    - very own models for walls, ceiling and floor of straight corridors, as well as corners and staircases.
- Duck Model as a curved object
    - since we haven't had time to create and animate our very own player model, we stuck to the duck.
- Models loaded via assimp
- Text objects with transparency
    - text objects on to the blackboards, with alpha values in the textures
- variable texture filtering
    - mip mapping and texture sampling variable (as stated in the *"experiment with opengl"* section)
- FBO for shadow mapping
    - FBO for rendering a single shadow map (for the light, the player is under)

Features

- manually (via text file) or randomly generated levels
- editable word lists
- text on blackboards
- movement around corners and down stairs via hermite-splines

Lighting and Texture

- multiple Light sources
- textured via Blender
- Textures mainly from *"Total Textures Repository"*

Libraries

- GLFW
- GLM
- Assimp

Effects

- multiple light sources
- Shadow mapping (for one light source)
- Normal mapping
- 3D text (not just plain 2D text - adapted from opengl-tutorial.org)
- shadow mapping & normal mapping adapted from opengl-tutorial.org
- Alternative mode with: (enable this mode in config- file)
    - Spot Lights
    - Cel Shading (+ Backfaces bigger and black)

Sources

- http://www.opengl-tutorial.org/intermediate-tutorials/tutorial-13-normal-mapping/
- http://www.opengl-tutorial.org/intermediate-tutorials/tutorial-16-shadow-mapping/
- http://www.lighthouse3d.com/tutorials/glsl-tutorial/toon-shading/
- http://www.gamedev.net/page/resources/_/technical/graphics-programming-and-theory/cel-shading-r1438
- http://www.lighthouse3d.com/tutorials/glsl-core-tutorial/spotlights/

Other special features in the game

- own collision detection
- some animated automatic movement via splines
- multiple light sources

Tools

- Blender

Interaction Sequence

The duck will start moving as soon as the first word was typed in correctly. Afterwards the player has to be quick enough to type in all words on the following blackboards.
Typing in a word correctly and fast enough increases the score. Typos or being to slow and therefore hitting a blackboard stops the duck moving and decreases the player's score - the duck will start moving forward again after the current word was typed in correctly.

Controls

- Arrows keys left and right move both, player and camera
    - not really needed since there are no obstacles in the way of the player as of now.
- Keyboard (a - z) keys
    - control the “word input” in the rendered game (aka the glfw window) which will be checked by the game mechanics in the command line window
- Level file

    - One can create own levels by following the level scheme at the end of this document. The level has to be saved as a text-file. The path to this file has to be typed into the config file. If the specified level file cannot be found, a random level will be created.
- Word file
    - One can create a own *.txt text file with words that should appear on the blackboard. Those words will be used in the game if the path to the file is entered into the config file. If the file cannot be found, a short and simple default list will be used. (see end of document)
- F-keys
    - F2 - frame time
      Toggles displaying the frametime in the commandline.
    - F3 - wireframe mode
      Toggles wireframe-mode on and off.
    - F4 - texture-sampling-quality
      Toggles the texture sampling quality between nearest-neighbor and linear
    - F5 - mip mapping-quality
      Toggles the mip-mapping quality between off, nearest-neighbour and linear
    - F6 - godmode.
      Toggles the "godmode". Godmode disables automatic moving and collision detection. The duck can be freely moved on double speed through walls, blackboards etc. with the arrow-keys.
    - F8 - view frustum culling
      Toggles the view frustum culling on and off.
    - F9 - transparency
      Toggles the transparency on and off.

Config

The config.txt file is located in the bin folder of the game. Please follow the instructions there.

Level Scheme

Each level-block goes into a new line. Not following this structure can lead to a crash.

- Straight bit:
  "XY" where "X" identifies the left wall and "Y" the right one
  Floor and ceiling are the same each time;
  Walls can be each can be:
    - "P" for a plain wall
    - "D" for a wall with door
    - "W" for a wall with window
- Corner:
    - left: "<"
    - right: ">"
- Stairs down: "-"

Example:

WP
>
DD
PW
-
PP
Place the file in the folder listed in the config.txt

Word Scheme

The word list can be filled with as many words as you like. Restrictions are the 26 letters of the english alphabet (a-z) plus no punctuations and space is allowed. You can either type in lower or capital letters. Place the file in the folder listed in the config.txt