Levels

Implementation:

Gameplay:
You can jump, shoot, grab floor tiles and move. 4 Enemies are constantly eating away the floor, if you fall down, you lose.

Effects:
Stefan Dietrich:
Shadow-Maps
Conelight

~~Marcus Auer:~~
~~Particle System (GPU)~~
~~Normal Mapping~~

Complex Objects:
The floor tiles as well as the enemies are loaded from .obj files and were modelled in Blender.

Animated Objects:
The enemies have rotors on their lower back, which spin slowly (0.5 rotations per second) those are seperate Objects which inherit their parents matrix and multiply it with their own.

View-Frustum-Culling:
The Frustum Culling is working via AAB and a Frustum-Matrix, all objects that are partially inside the Frustum-Matrix get drawn.

Transparency:
~~The Transparency is visible in the particles of the particle system.~~ Transparency was added to all objects upon press of F9. This is not fully tested.

Illumination:

There is one Light-Source at the position (5, 20, 10) which is pointing towards (0, 0, 0). It is a cone light with an opening radius of 0.67 rad and a 10% distance-transition from not illuminated on the cones edge to illuminated in terms of cone radius.

External Libraries:

PhysX - https://developer.nvidia.com/physx-sdk
FreeImage - http://freeimage.sourceforge.net/
AssImp - http://assimp.sourceforge.net/
GLFW - http://www.glfw.org/
GLM - http://glm.g-truc.net/

Controls:

W,A,S,D	Move
Space	Jump
Left Click	Shoot
Right Click	Pick Up Floor-Tile
F2	Frame-Time On/Off
F3	Wireframe On/Off
F4	Swap Texture-Sampling-Quality
F5	Swap Texture-Mipmap-Modes
F6	Swap Jump to Flight (for evaluation purposes)
F9	Transparency On/Off
F10	Swap Shader-Test-Modes
F11	Testmesh On/Off

Effect Implementation:

The OpenGL Tutorial (http://www.opengl-tutorial.org/) was used for implementing Shadow Maps. The Conelight implementation was made according to derivation of how any specular/diffuse shading from the course „Einführung in die Computergraphik“ works, by measuring the angle of a vector from the surface to the lightsource, and producing a (partial) cut-off once it got to far of the light-direction vector. For the Depth-Test for the Shadow-Maps a test-construed formula was used that implements a divisor that reduces its value ratio by distance (log(w)).