

# EZG18 - Haunted Castle

---

<> Brief description of the implementation, in particular a short description of how the different aspects of the requirements (see above) were implemented - be specific, but keep it concise.

## Story

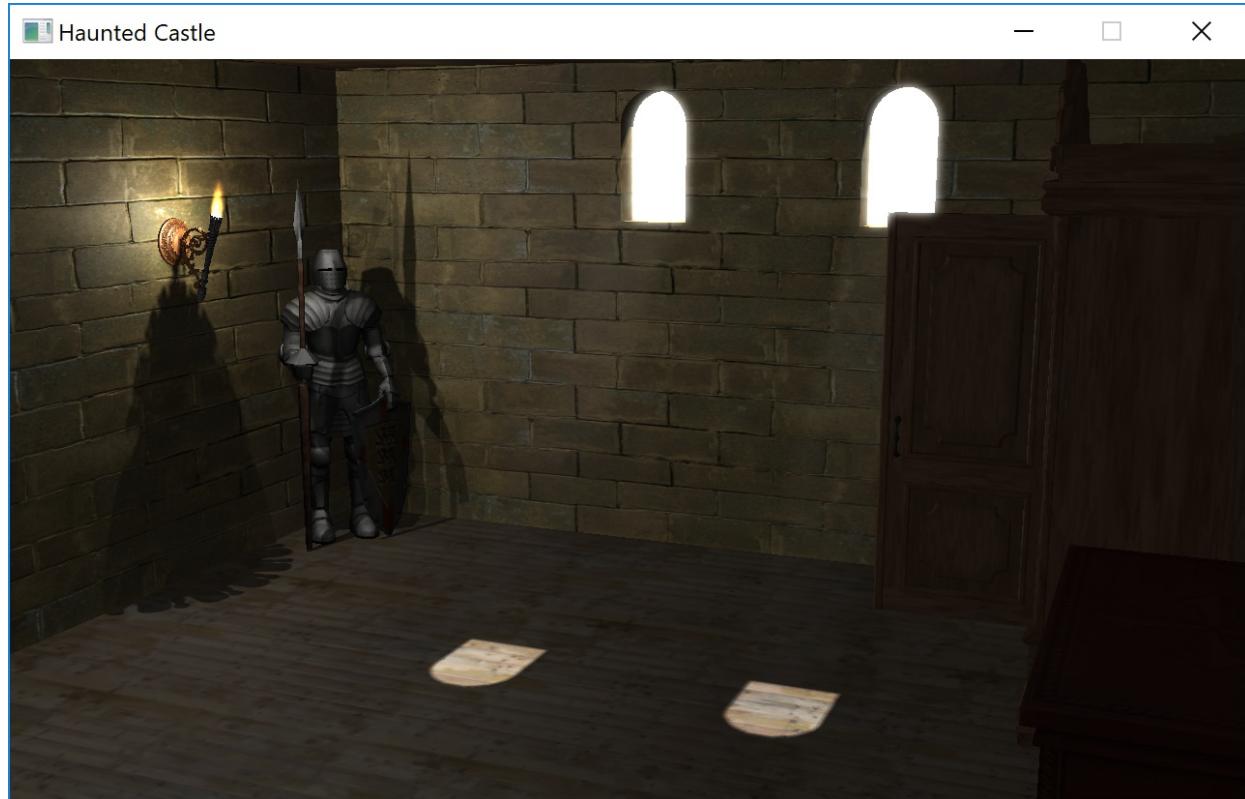
---

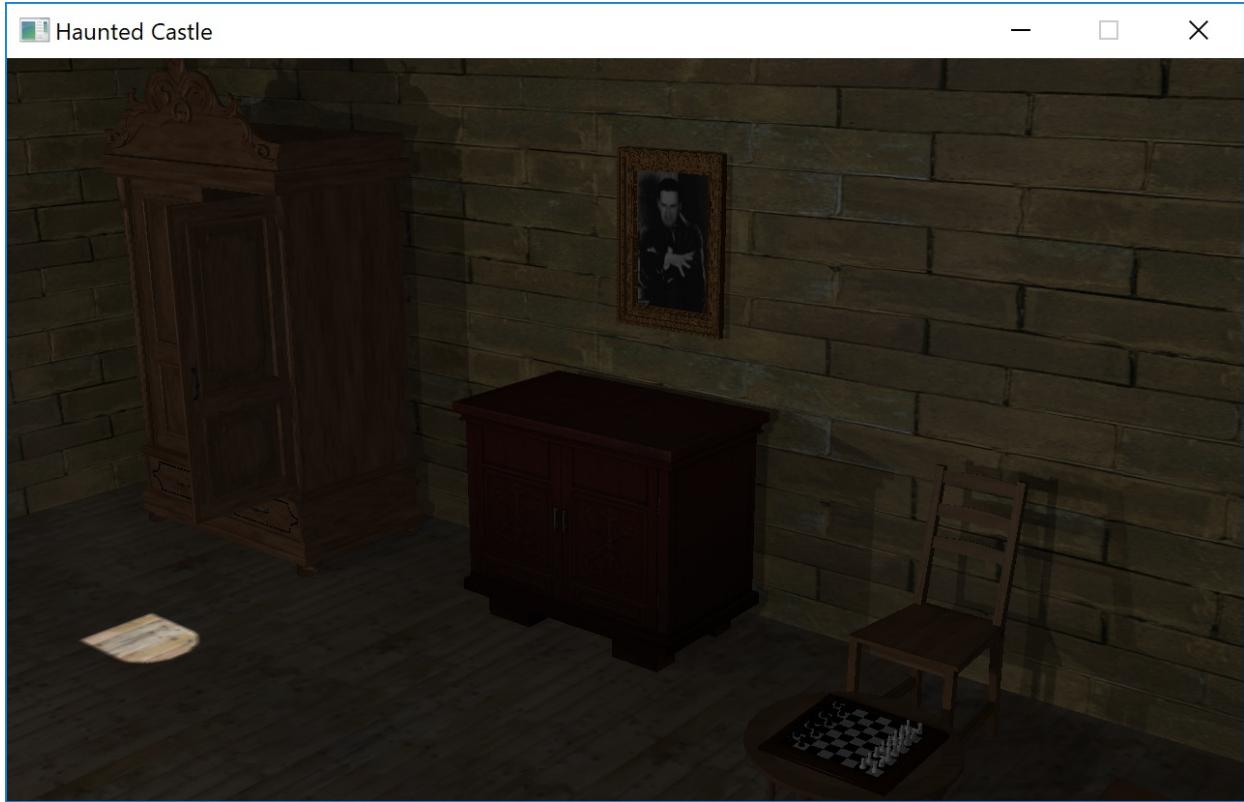
The user finds herself/himself in a medieval dark room and can barely identify the objects around him/her. Suddenly torches catch fire as if by ghost hand. He/She takes a look around the room and sees different things moving: A chair that is moving forward, chess figure starting moving, torches move to an upright position and paintings falling down. All ends with the wardrobe falling on the user.

## Scene

---

Medieval room with torches on fire, knight armors, chairs with chess desk, stone walls, paintings and closet.





## CONTROLS

---

### ALWAYS AVAILABLE

Key(s)	control
F1	Help / Show Controls
F2	Frame Time on/off
+/-	Ambient Light up/down
Page up/Page down/Pos1	Speed up/down/reset
C	Debug Mode on/off
ESC	Quit Game

### JUST IN DEBUG MODE

Key(s)	control

F3	Wire Frame on/off
F4	Textur-Sampling-Quality: Nearest Neighbor/Bilinear
F5	Mip Mapping-Quality: Off/Nearest Neighbor/Linear
F6	Viewfrustum-Culling on/off
F7	Normal Mapping on/off
F8	Fire and Shadows 1 on/off
F9	Fire and Shadows 2 on/off
F10	Bloom on/off
F11	Light Shafts on/off
W, ARROW UP	Accelerate
S, ARROW DOWN	Decelerate/Backwards
A, ARROW LEFT, MOUSE DRAG RIGHT	Pan left
D, ARROW RIGHT, MOUSE DRAG LEFT	Pan right
Q	Go down
E	Go up
MOUSE DRAG UP	Camera down
MOUSE DRAG DOWN	Camera up

## DEVELOPMENT STATUS

---

Implemented:

- [Bling-Phong illumination model](#)
- Loading all [models](#) with textures
- Debug camera ([Controls](#) see above)

- Camera Path ([Cubic Hermite](#))
- All [Effects](#) (See below)

## EFFECTS

---

<> TODO How you've implemented those Effects (Links/References to papers, books or other resources where the effect is described and a description of your extensions to it)

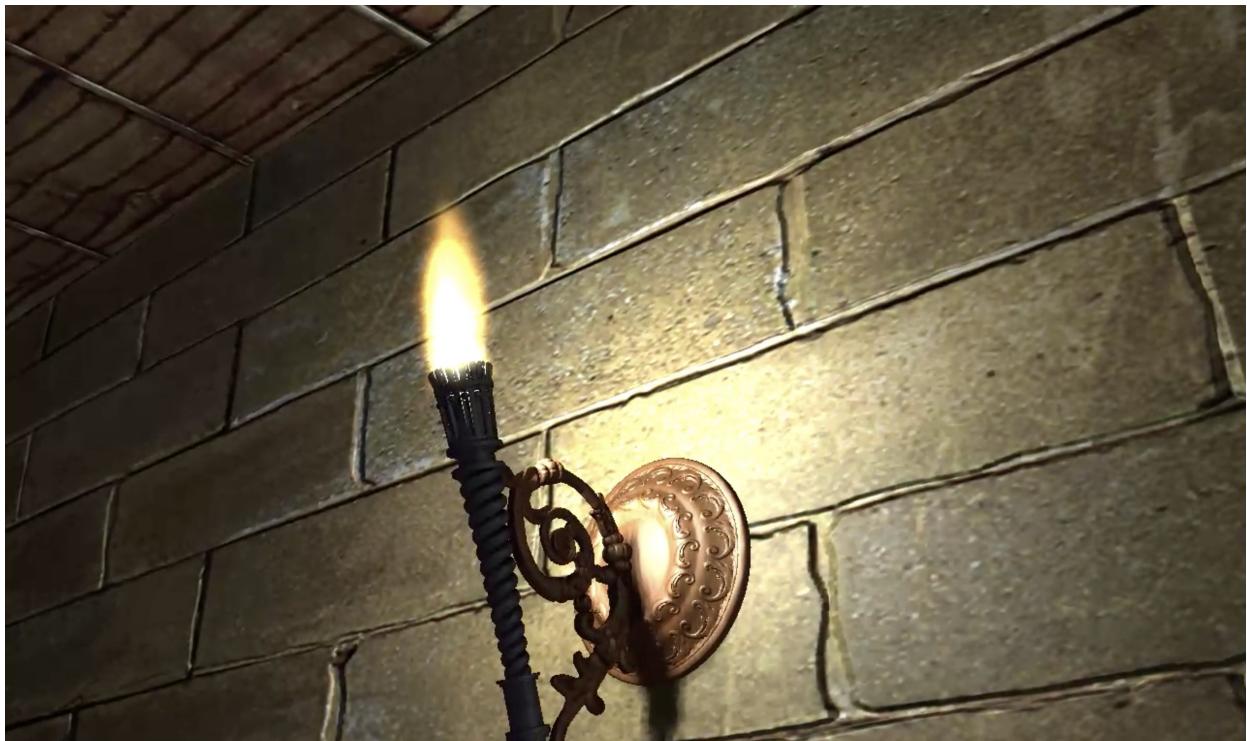
- Direction shadows with PCF (from the sun)
  - <https://learnopengl.com/Advanced-Lighting/Shadows/Shadow-Mapping>



- Bloom (Bright Window)
  - <http://learnopengl.com/#!Advanced-Lighting/Bloom>



- Fire (Particle Effect)
  - Revision Course Slides: Particle Systems (2018W)
  - Revision Course Slides: Particle Systems (2018W)



- Omnidirectional Shadows (Shadows of Torches)
  - Revision Course Slides: Omnidirectional Shadows (2018W)

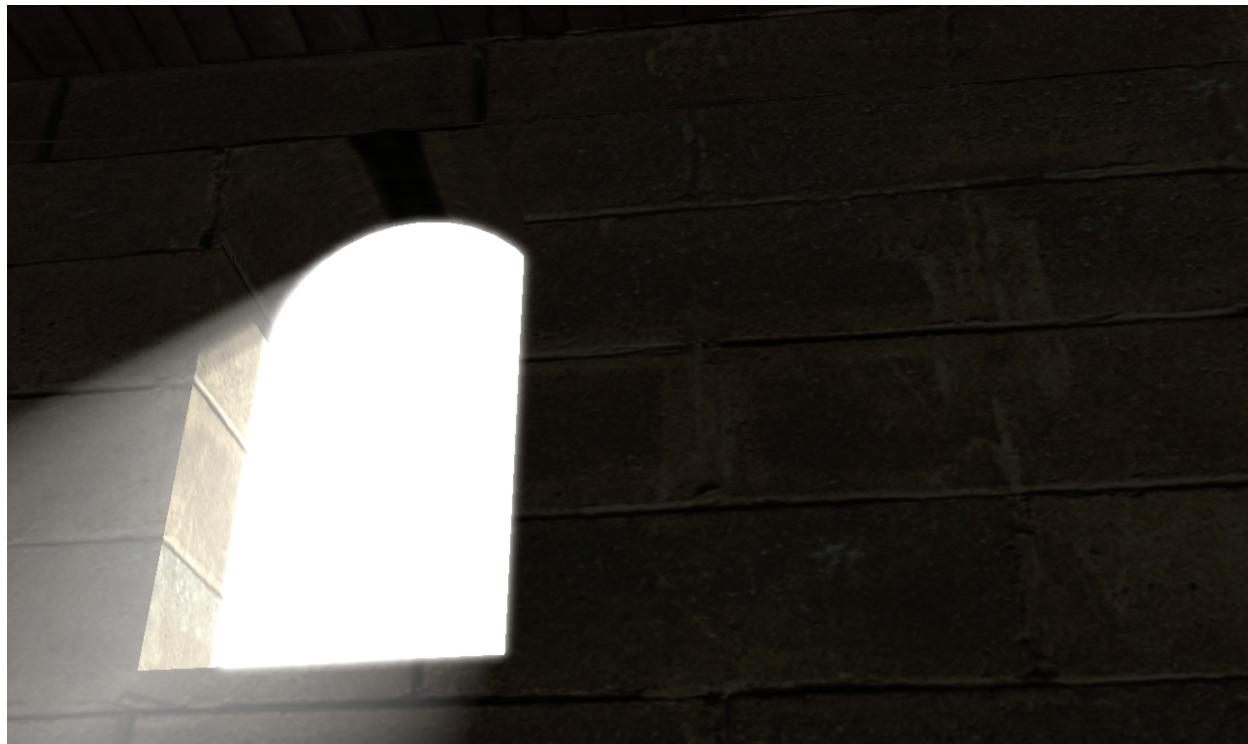


- Bump Mapping (Wall)
  - Kilgard, M. J. (2000, July). A practical and robust bump-mapping technique for today's GPUs. In Game Developers Conference 2000 (pp. 1-39).  
<https://www.cg.tuwien.ac.at/courses/Realtime/slides/VU.WS.2013/PracticalBumpMap.pdf>



- Volumetric Lighting (Light Rays from Sun)

- Revision Course Slides: Volumetric Lighting (2018W)



## IMPLEMENTATION DETAILS

---

### Requirements

- Windows
- OpenGL 3.3 Core Profile
- NVIDIA GTX 1060 (Tested on AMAROK PC in VisLab)

### Tools

- Visual Studios 2013
- Blender: <https://www.blender.org/>
- HitFilm Express: <https://fxhome.com/express>

### Libraries used

- Assimp: <http://www.assimp.org/>
- FreeImage: <http://freeimage.sourceforge.net/>
- Glew: <http://glew.sourceforge.net/install.html>
- PhysX: <https://developer.nvidia.com/physx-sdk>
- fmod: <https://www.fmod.com/>

## Models

- Chessboard with figures: <https://free3d.com/3d-model/chess-table-18114.html>
- Chest of drawers: <https://www.turbosquid.com/3d-models/free-sideboard-3d-model/558818>
- Frame: <https://free3d.com/3d-model/frame-75994.html>
- Knight1 and Knight2: <https://free3d.com/3d-model/knight-84265.html>
- Door: <https://free3d.com/3d-model/medieval-door-16986.html>
- Torches: <https://www.yobi3d.com/q/3d-models-fire-torch>
- Wardrobe: <https://www.turbosquid.com/3d-models/classic-wardrobe-unwrap-model-1288182>
- Chairs: <https://www.turbosquid.com/3d-models/free-wooden-chair-3d-model/791045>
- Table: <https://free3d.com/3d-model/round-table-928375.html>

## Additional Textures

- Walls of Room: Stone(1)01 from  
[https://www.cg.tuwien.ac.at/courses/Textures/Total\\_Textures\\_V1/](https://www.cg.tuwien.ac.at/courses/Textures/Total_Textures_V1/)
- Ceiling of Room: Wood(2)09 from  
[https://www.cg.tuwien.ac.at/courses/Textures/Total\\_Textures\\_V1/](https://www.cg.tuwien.ac.at/courses/Textures/Total_Textures_V1/)
- Floor of Room: Wood(2)10 from  
[https://www.cg.tuwien.ac.at/courses/Textures/Total\\_Textures\\_V1/](https://www.cg.tuwien.ac.at/courses/Textures/Total_Textures_V1/)
- Frame Image: <https://dermeister.at/evilmaster01.jpg>

## Music

- Spooky Music Instrumental - Ravensbrook: <https://www.youtube.com/watch?v=H9D8fAC6CoU>
- Sound Effects: <https://freesound.org>

## VIDEO

---

Coming soon

## Authors

---

- Michael Pointner
- Simon Reisinger