"The Boiler Makers"

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1 Content

In a small factory of the 18th century, there's a lot going on. Fire is burning to heat the water in a boiler. Steam is exhausted through several valves and leaks of the piston chamber. Smoke and particles of hot glowing metal are hurtling through the environment which is sparsely illuminated by several flickering light bulbs.

2 Effekts und details

Musts:

- Kinematic animation
- Bump mapping especially on rusty metal and wooden surfaces [2], [1]
- Shading (Phong)
- Shadowing and self-shadowing [3], [?]
- Steam exhausted by the engine

Nice to have:

- Shading (Ambient occlusion)
- Particle system simulating the effect of glowing pieces of metal produced by the hammer falling on the ambos [5]
- Refraction mapping of water in the compensation tank for the boiler [6]
- Motion blur of fast moving devices such as the falling hammer, the spinning fly wheel and regulator [4]
- Fire beneath the boiler

- Smoke produced by the fire
- Illumination caused by flickering light bulb
- Coarse dirt and dust everywhere (i.e. render whole scene gain with simplified geometry a little larger with a greyish texture, blended over the original model)

Hints regarding the model:

- The piston of the steam engine should be round
- There should be a water tank
- More details
- Environment needs to be modeled (e.g. walls, floor)
- Tools lying around (google warehouse)

The functionality of a common steam engine is shown in:

Literatur

[1] Sam Dietrich. Hardware bump mapping. *Game Programming Gems*, 2000.

[2] Thomas Moeller and Haines Eric. Bump mapping. *Real-Time Rendering*, 1999.

[3] Gabor Nagy. Real-time shadows on complex objects. *Game Programming Gems*, 2000.

[4] Gilberto Rosado and Rainbow Studios. Motion blur as a post-processing effect. *GPU Gems 3*, 2007.

[5] J. Van der Burg. Building an advanced particle system. *Game Developer Magazine*, 3, 2000.

[6] Alex Vlachos and Jason L. Mitchel. Refraction mapping for liquids in containers. *Game Programming Gems*, 2000.