RiftBlade - A Virtual Reality Sword Fighting Game

SWP SS 2014 - Team D

RWTH Aachen University

6. August 2014

Concept

- Goal: Avoid genres that are common in low budget virtual reality games
- Spontaneous idea: First person swordfighting
- Focus on technology and implementation rather than complicated gameplay design - simple arena gameplay, player fights a single enemy in a limited environment

Goals

- Primary goal: Graphical fidelity and solid mechanics (i.e. stable physics, animations, etc.)
- Make the simple gameplay (hit the enemy faster than he hits you) look and feel good by nailing the technical implementation

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- Treadmill for player movement control

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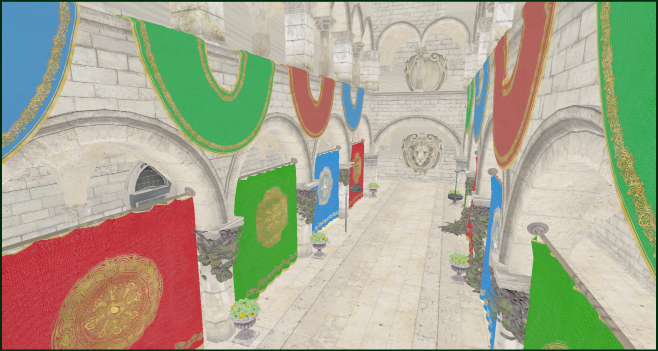
- Store positions and normals in view space
- Problem: Positions require a floating point buffer - proved to be imperformant; Positions are now reconstructed from depth

Implementation: The rendering pipeline

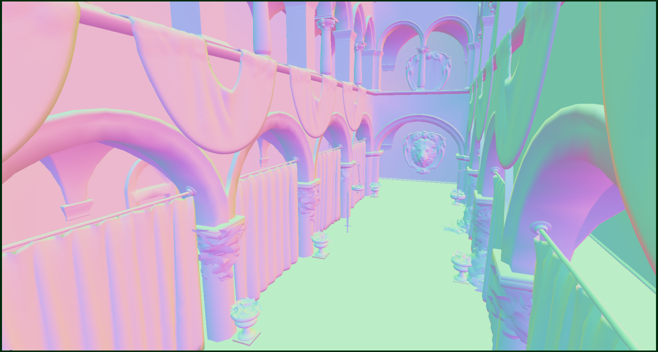
Diffuse Buffer



- GL_RGB color texture

Implementation: The rendering pipeline

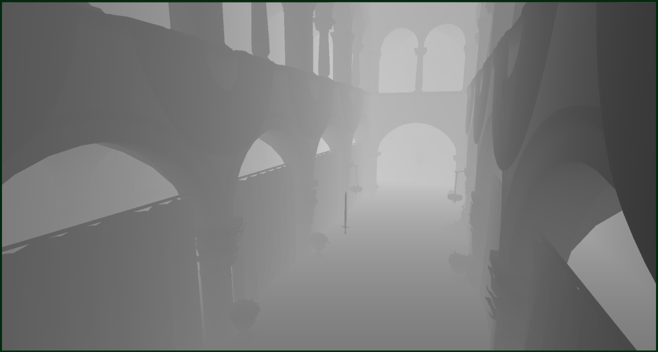
Normal Buffer



- GL_RGB color texture

Implementation: The rendering pipeline

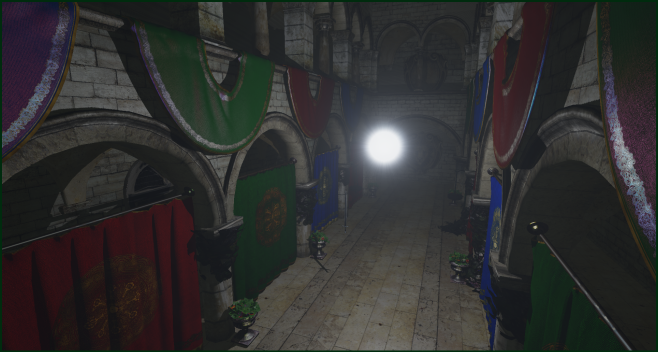
Depth Buffer



- 24 bit depth texture

Implementation: The rendering pipeline

Final Image



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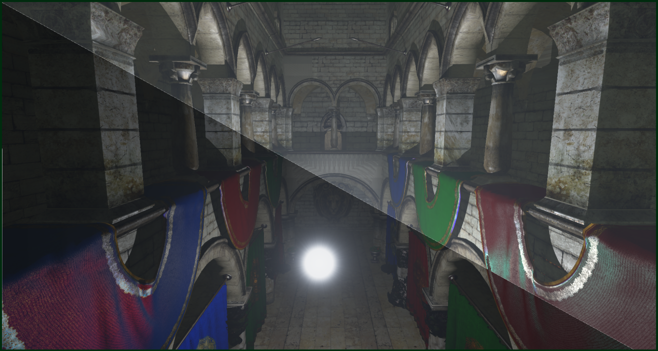
- Final pass: Apply tonemapping (no dynamic adaption though)

Implementation: The rendering pipeline

Tonemapping: Enabled (Left) vs. Disabled (Right)

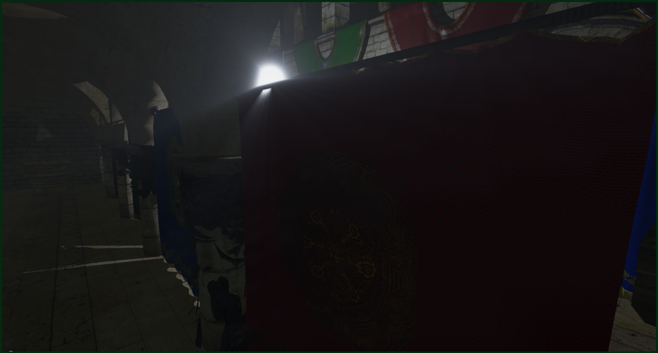


Implementation: The rendering pipeline

- Volumetric lights are rendered in another pass (several passes actually)

Implementation: The rendering pipeline

Volumetric lighting

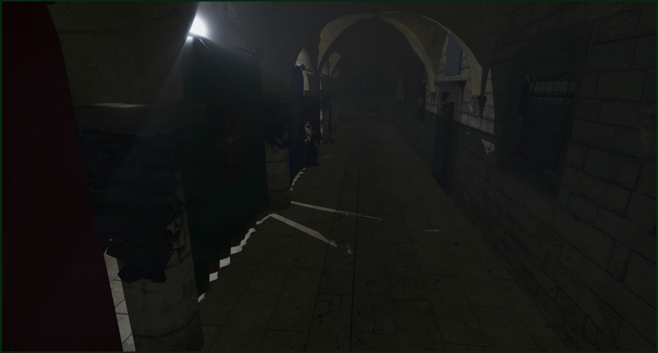


Implementation: The rendering pipeline

- Shadow maps are created in a pre-pass, then taken into account in the light pass

Implementation: The rendering pipeline

Shadow Mapping

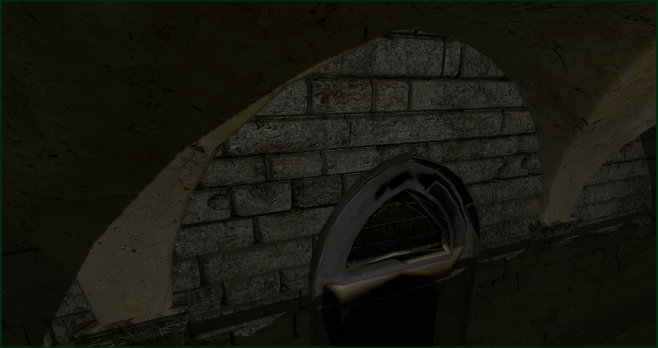


Implementation: The rendering pipeline

- We also tried our hand at Parallax Occlusion Mapping

Implementation: The rendering pipeline

Shadow Mapping



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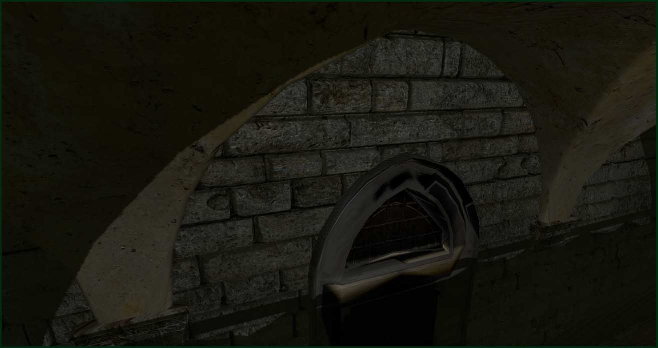

- …but as it turns out, some tangent-vectors were corrupted.

Implementation: Animations

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- Effect can best be seen in our gameplay presentation ;)

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- We actually implemented inverse kinematics to allow for free sword control with correct arm movement...
- ...but it turned out much worse looking than we hoped
- We now use a more straightforward approach with two WiiMotionPlus controllers instead of one that allow for better tracking of the whole arm
- Treadmill integration turned out quite trivial. There never was any treadmill to integrate.

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- We were able to achieve most goals...
- ...however some things didn't exactly work out as planned
- Normal Mapping and Parallax Occlusion Mapping look a bit strange...
- ...not only, but also because some of our UV maps are exported incorrectly

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- Some bugs couldn't be resolved in time...
- ...but in the end, what game is bug-free at release? ;)

Thanks for listening...

...now please enjoy our gameplay presentation. :)