

Thesis no: BGD-2014-01



Automatic spotlight distribution for indirect illumination

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This thesis is submitted to the Faculty of Computing at Blekinge Institute of Technology in partial fulfillment of the requirements for the degree of Bachelor of Science in Digital Game Development. The thesis is equivalent to 10 weeks of full time studies.

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Abstract

Context. Indirect illumination – the light contribution from bounce light in an environment – is an important effect when creating realistic images. Historically it has been approximated very poorly by applying a constant ambient term. This approximation is unacceptable if the goal is to create realistic results as bouncing light contributes a lot of light in the real world.

Objectives. This thesis proposes a technique to use a reflective shadow map to place and configure spotlights in an environment to approximate global illumination.

Methods. The proposed spotlight distribution technique is implemented in a delimited real time graphics engine, and the results are compared to a naive spotlight distribution method.

Results. The image resulting from the proposed technique has a lower quality than the comparison in our test scene.

Conclusions. The technique could be used in its current state for applications where the view can be controlled by the developer such as in 3D side scrolling games or as a tool to generate editable indirect illumination. Further research needs to be conducted to make it more broadly viable.

Keywords: Reflective shadow map, global illumination, spotlight.